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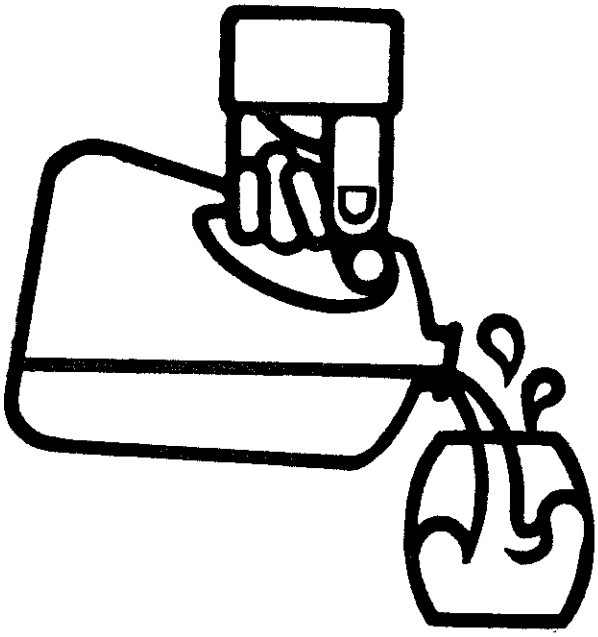
Proceedings

"INCREASING MILK AND MILK PRODUCT CONSUMPTION: ISSUES FOR THE 80s"



Hotel Syracuse March 15-16, 1983

Sponsored by

Department of Agricultural Economics,
New York State College of Agriculture and Life Sciences
and
Cornell Cooperative Extension
Cornell University
Ithaca, New York 14853

"INCREASING MILK AND MILK PRODUCT CONSUMPTION: ISSUES FOR THE 80s"

Proceedings

of a

Conference held at Hotel Syracuse
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Edited by
Robert D. Boynton

Dear Friends of the Dairy Industry:

The papers published in this Proceedings were all prepared for and delivered at a conference entitled, "Increasing Milk and Milk Product Consumption: Issues for the 80s," held in Syracuse, New York on March 15 and 16, 1983. The conference provided an opportunity for representatives from academia, government and industry to discuss research results and share ideas and views on consumption-related problems and opportunities in the 80s. It is hoped that this conference aided in the development of meaningful actions and programs to improve the welfare of dairy farmers and the entire dairy industry.

The many participants are to be commended for the insight and enthusiasm which they put into their presentations. Their comments provided a solid basis for discussion, the identification of important issues, and the creation of possible solutions to problems. We especially thank the industry participants for giving freely of their time and sharing their unique knowledge and perspective.

The conference was planned by an organizing committee composed of several members of the faculty of the College of Agriculture and Life Sciences. In addition to myself, Robert Boynton, Henry Kinnucan, Andrew Novakovic from the Department of Agricultural Economics, W. Frank Shipe from Food Science, and Walter Wasserman from Cooperative Extension comprised the Planning Committee. Henry Kinnucan and Walter Wasserman provided much of the leadership and were responsible for the arrangements for the program participants and the conference facilities.

Several other members of the staff of the Department of Agricultural Economics helped in many ways on different aspects of the conference, including Barbara Littlefair, Wendy Barrett, Robin Greenhall, Cherie Morse, Angie Torchia, and Judy Watkins. Their help was essential to the success of the conference and the preparation of this Proceedings. Special thanks go to Robin Greenhall for preparing this Proceedings for publication.

We hope that the papers published in this form will serve as a handy and useful reference to dairy industry and other agricultural leaders, as well as others interested in the dairy industry.

Olan D. Forker
Chairman, Department of Agricultural Economics
Cornell University
June, 1983

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THE CURRENT STATUS OF THE U.S. MARKET FOR DAIRY PRODUCTS*

Henry W. Kinnucan

I am very pleased to have this opportunity to discuss with you my assessment of the current status of the U.S. market for dairy products. Because this is a consumption oriented conference, I will take the liberty of ignoring for the most part the supply side of the market. Not only does this simplify my task, it also makes it a bit easier to emphasize the positive.

Essentially there are three points I would like to make with respect to the current status of the U.S market for dairy products. These are: 1) dairy farmers for some thirty years now have faced a relatively stagnant demand for their product, 2) the reasons for this relatively flat growth in farm level demand appear to be largely noneconomic ones and, 3) there are some positive signs that market conditions for farm milk, on the demand side anyway, are improving and will continue to improve in the years ahead.

Let me develop each of these points now in more detail. First the point that the farm level demand for milk has been virtually stagnant for some thirty years now. Let's look at the facts. Between 1950 and 1980 the U.S. population grew from 151 million to 228 million people - an increase of more than 50% (Figure 1). Given this tremendous growth in population one would expect substantial increases in the commercial utilization of milk. The fact is the milk equivalent consumption of dairy products grew by less than 10% over this period. In fact, total commercial sales of farm milk in 1970 (114 billion pounds - milk equivalent) was at the same level of 20 years earlier. Confronted with these statistics one must conclude that the major long-term problem facing the dairy industry is one of effectively marketing milk and other dairy products.

Why is it that the farm level demand for milk has failed to grow during this period of rapid population growth? A look at the consumption trends of individual dairy products over this period helps to shed some light on the question. While there has been some very large increases in cheese sales - the average annual increase in per capita sales was 4% during the 60s and this growth rate accelerated to 6% during the 70s - declines in the per capita consumption of the other major dairy products worked to more than offset these increases (Figure 2). In particular, per capita sales of fluid milk over the 1955-80 period declined at an average annual rate of 1.1% and per capita butter sales declined each year on average 1.5%. The combined effect of these trends was to decrease the milk equivalent per capita consumption of dairy products from 769 pounds in 1947 to 526 pounds in 1982. From these numbers it is apparent that without population growth the dairy industry as we know it would be considerably diminished in size.

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* Basic data source for all figures in this text, with the exception of Figure 5, is various issues of the Dairy Outlook and Situation, published by the Economic Research Service of the USDA.

The author is a Research Associate in the Department of Agricultural Economics, Cornell University.

What explains these trends in the retail demand for dairy products? Economic factors are certainly important, but I am going to argue that they are not the primary forces behind these trends. This is because the real cost to the consumer of most major dairy products has declined significantly over time. For example, according to USDA data, the average U.S. worker in 1980 spent only eight minutes on the job to earn enough money to purchase a ½ gallon of milk (Figure 3). Thirty years earlier, a ½ gallon of milk would have cost the same worker 16 minutes on the job. One pound of butter required one-half hour on the job in 1950, compared to 15 minutes in 1980. A half-pound of American cheese could be purchased for ten minutes of work time in 1980, but required 12 minutes in 1950. To purchase ½ gallon of ice cream required 36 minutes on the job in 1950 compared to 15 minutes in 1980. If economic factors are that important, why is the consumption of fluid milk and butter declining at the same time their real costs to the consumer is going down? One might argue that in the case of butter it is not so much the price of butter that matters, but rather its price relative to that of margarine. This is a valid point. However, when one looks at the data one sees per capita butter consumption declining at its fastest rate over a time period (1950-70) when the price of butter relative to the price of margarine is relatively constant (Figure 4). Moreover, between 1975-80 butter prices increased sharply and margarine prices remained virtually unchanged, yet per capita butter sales over this period declined at its slowest rate in 25 years.

FIGURE 3. TIME WORKED TO EARN MONEY TO PURCHASE MAJOR DAIRY PRODUCTS, UNITED STATES, 1950-80

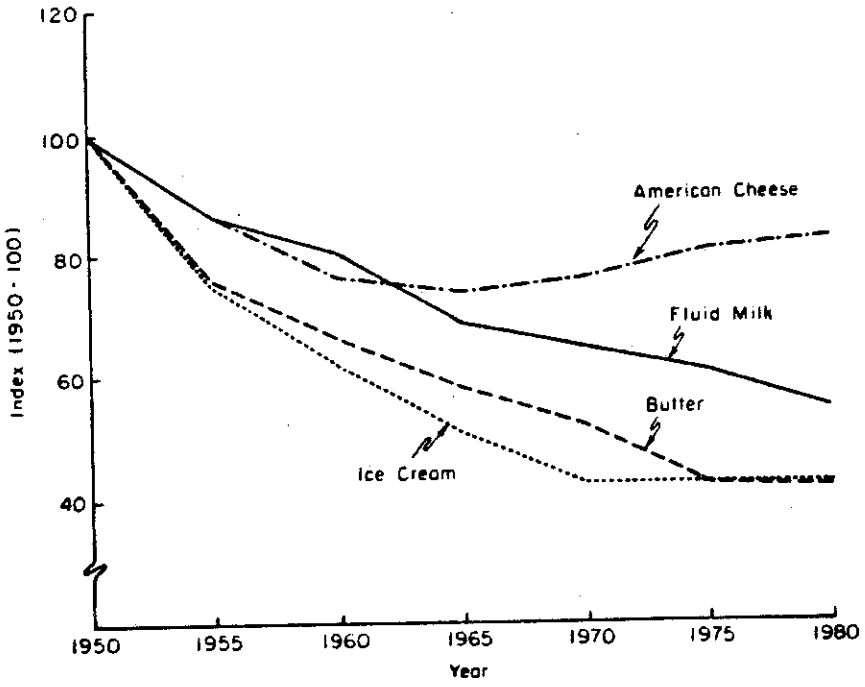
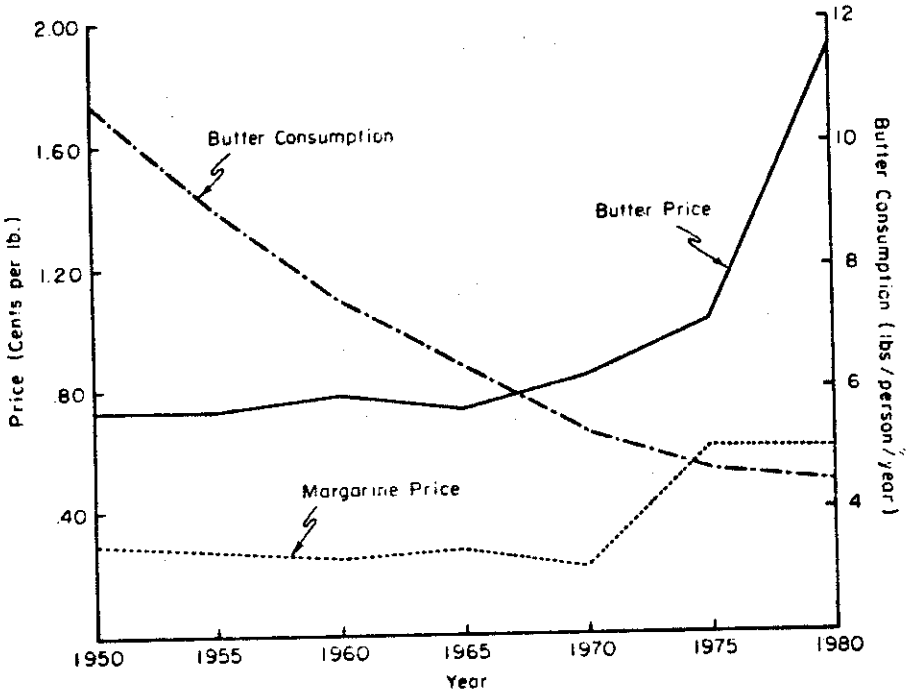


FIGURE 4. PER CAPITA BUTTER CONSUMPTION, RETAIL PRICE OF BUTTER AND MARGARINE, UNITED STATES, 1950-1980



If economic factors are not largely responsible for the retail trends in dairy product consumption, then what? I will not pretend to have a complete answer to this question, but I think the evidence is becoming pretty clear on one point: demographics are important, especially for understanding trends in fluid milk sales. Survey data consistently show Blacks consuming less milk than whites and census data indicate that Blacks represent a growing proportion of the U.S. population. Furthermore most, if not all, studies of milk consumption show a strong inverse relationship between age and milk drinking and demographers tell us that the American population is growing older.

To sharpen our insights on the actual effect that these demographic trends may have on milk consumption let one draw on some results of a study I recently completed of milk demand in the New York City metropolitan area. This study, which looked at nearly ten years of monthly data over the period 1971-80, pointed to age and race factors as being much more important than economic factors and milk advertising in explaining fluid milk sales. In particular, the study found that for each one percent increase in the proportion of the population in the nonwhite category, per capita milk sales would be expected to decline by 0.593%, assuming the other factors influencing milk demand, such as income, milk prices, competing beverage prices, and age structure remain unchanged. Similarly, for each one percent decrease in the percentage of the population in the less than 20 age group, the study estimates that per capita fluid milk sales would decline 0.722%, other things being equal.

Applying these coefficients to the changes in age structure and racial composition actually occurring in the U.S. population provides a rough idea of the importance of these demographic changes for milk consumption in the U.S. According to Census data, between 1960 and 1980 the Black population proportion increased 11.4% and the less than age 18 population proportion decreased 22.2%. According to the age and race coefficients discussed above, these changes would be expected to result in an average annual rate of decline in per capita milk sales over this period of 1.07% ([22.2% x (-.593) + (-11.4%) x .722]/20 years = 1.07%/yr.), assuming no changes in the other factors influencing milk sales (Figure 5).

FIGURE 5. **EFFECT OF AGE STRUCTURE AND RACIAL COMPOSITION CHANGES ON PER CAPITA MILK SALES**

CHARACTERISTIC	EFFECT
assuming each factor could be changed independently, for each one percent increase in the percentage of the population which is...	...the per capita sales of fluid milk would change by approximately the following percentage:
nonwhite	−0.59%
less than age 20	+0.72%

IMPLICATION

Average annual change in U.S. per capita sales of milk 1960-1980

ACTUAL	−0.93%
EXPECTED*	−1.07%
DIFFERENCE	+0.14%

*on the basis of age and race changes alone.

SOURCE: Based on the research discussed in Kinnucan, H.W. "Demographic versus Media Advertising Effects on Milk Demand: The Case of the New York City Market," Agr. Econ. Staff Paper No. 82-5, Cornell University, March 1982.

The fact that the actual rate of decline in annual per capita milk sales over this period was somewhat smaller (-0.93%) suggests that the favorable trends in the economic factors affecting milk sales, i.e., a constant or declining real price of milk combined with rising affluence, as well as the positive influence of milk advertising, helped to offset the negative consequences of demographic change. An important point though, is that the magnitude of the offset (0.14%) is small relative to the large negative effect of demographic change (-1.07%). These calculations reinforce in specific terms the notion that demographic change has been historically a much more potent force in determining the level of milk sales than has been changes in other factors.

So far I have discussed two points: 1) the farm level demand for milk since WWII has been essentially flat, especially when compared to what would have been expected on the basis of population growth and, 2) the reasons for this relatively stagnant demand appear to be largely noneconomic. The third and final point I will discuss is that there are signs that the market conditions for farm milk are improving and may well continue to improve in the years ahead. This optimism is based in part upon the fact that the rate of decline in the per capita consumption of dairy products (on a milk equivalent basis) appears to have bottomed out. In the three five-year intervals between 1955 and 1970 the per capita milk equivalent consumption of dairy products declined 6.6%, 6.4% and 10.2%, respectively (Figure 6). By contrast, in the five-year interval 1970-75, per capita milk equivalent sales declined only 2% and this rate of decline slowed further in the 1975-80 interval to a mere 1.1%.

FIGURE 6. MILK EQUIVALENT CONSUMPTION OF DAIRY PRODUCTS, U.S., Five Year Intervals, 1955 - 1980

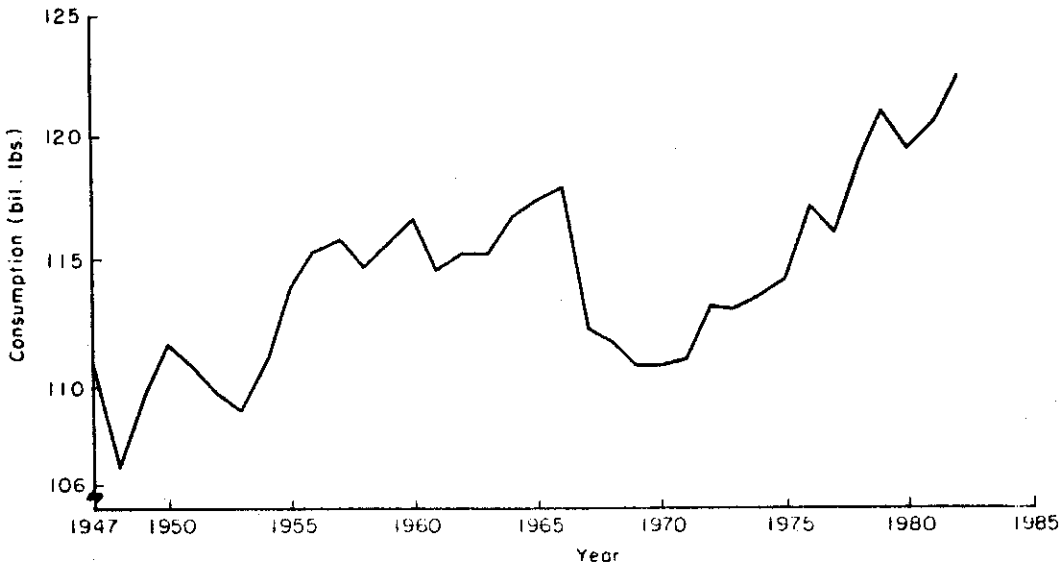
Year	Consumption			
	Total (mil. lbs.)	Change (%)	Per Capita (lbs.)	Change (%)
1955	114,077	—	687	—
1960	116,552	2.2	642	-6.6
1965	117,493	0.8	601	-6.4
1970	110,813	-5.7	540	-10.2
1975	114,218	3.1	529	-2.0
1980	119,624	4.7	526	-1.1

This apparent bottoming out of declines in per capita milk equivalent consumption has translated into some historically rigorous rates of growth in the aggregate farm level demand for milk. In particular, during the five year interval 1975-80 aggregate farm level demand for milk increased at a faster rate (4.7%) than in any five-year interval since 1955 (Figure 6). Moreover, according to USDA figures, in 1982 milk equivalent commercial sales hit 123

billion pounds. This is a new record by almost three billion pounds and represents a 2.3% increase over 1981 commercial sales. A continuation of this growth will result in a 7% rate of growth for the five-year interval 1980-85. This 7% figure is double the growth rate experienced during the 1970-75 period and is substantially above the 1975-80 growth rate of 4.7%.

In conclusion, let me say that this recent upward trend in the total milk equivalent consumption of dairy products (Figure 7) will not continue on its own. The industry must work together to insure that: 1) the consumer receives a top quality product at an affordable price, 2) the consumer is well-acquainted with the benefits of consuming milk and other dairy products, and 3) new uses of milk are found that meets the needs and desires of consumers.

FIGURE 7. MILK-EQUIVALENT CONSUMPTION OF DAIRY PRODUCTS, UNITED STATES, 1947-82



THE GROWTH POTENTIAL OF IMITATION CHEESE: AN INDUSTRY PERSPECTIVE

Richard W. Gochnauer

Talking about imitation cheese to a dairy industry group interested in the growth potential for milk products, makes me feel a little bit like an early Christian appearing before the Romans in the Coliseum. But on reflection, this gives me an opportunity to address one of the areas in which I think a misconception exists about imitation cheese, namely its comparison to the margarine/butter story. I do not believe the comparison between imitation cheese/real cheese and margarine/butter is an accurate one. I was asked to address some of the issues having to do with the motivation of manufacturers for getting into imitation cheese as well as what is the product's growth potential. I will attempt to do that by 1) addressing what I believe are some of the primary driving forces or strategies companies use as justification for entering this market, 2) discussing the user motivation for purchasing imitation cheese, 3) expound on why I believe imitation cheese and margarine are not accurate comparisons, and 4) discuss a bit about imitation cheese's growth potential.

Driving Forces or Strategies of Manufacturers of Imitation Cheese

John Zimmerman and Ben Tregoe in their book Top Management Strategy attempt to identify what they call driving forces which explain the basis behind company strategy and provide an explanation as to why companies move in certain directions and do certain things. They identify 9 driving forces which are listed in Figure 1. The first four of these I will address in more detail because I think they bear on what strategies have been employed by manufacturers getting into this field. The other five I will touch on very briefly.

"Technology" as a driving force means that companies who have a key technology--fermentation or waste treatment or whatever--look for products and market opportunities that build on that technology. A good example of the "methods of sale" driving force is Tupperware and Avon which have a large direct sales force; they look for products which can be moved through that selling arrangement. The "method of distribution" driving force involves companies that use a special distribution capability--e.g. refrigerated distribution--to identify products and market opportunities which build on that capability. Companies who are driven by the "market share/growth" orientation tend to be those who feel growth is the primary consideration. They are not tied to a particular product or industry. The same holds true for companies who are primarily financially oriented. They want a certain profit or return and whether it comes from selling products to one market or another or marketing one type of product or another is not really important to them.

FIGURE 1. How Do Manufacturers View Imitation Cheese, 9 Driving Forces

1. Products Offered	5. Technology
2. Market Needs	6. Method of Sale
3. Production Capability	7. Method of Distribution
4. Raw Material (resource)	8. Size/Growth/Market Share
	9. Return/Profit

The author is Vice President and General Manager of the Cheese Division, Universal Foods Corporation, Milwaukee, Wisconsin.

The driving forces I want to cover in more detail are the first four. The "products offered" driving force characterizes a company which identifies with a product or product line. They tend to sell other products which are similar to the products they currently have. They tend to come out with more line extensions than with completely new products. They tend to seek avenues for growth by selling those same products to new markets that will utilize their existing product.

A "market needs" driving force company tends to be one which essentially identifies itself with a market or market segment. Such a company says "we know how to sell to this type of consumer or account" or "we understand that segment." They look for products which fill the needs of that particular segment. They tend to do a lot more work in the area of market research to identify the needs of the particular market they are serving.

A "production capability" company is one whose main strength has to do with production capabilities--their know-how in producing products. They tend to look for new products which can be produced using their existing equipment and packaging systems. They tend to be low cost producers and they are typically found in the foodservice and industrial segments or the private label field, if they make a consumer product.

The fourth salient driving force is "raw material" orientation. These are companies like milk cooperatives, oil companies, and lumber companies which are primarily driven by a raw material source. They tend to look for new products or new market opportunities that allow them to utilize that raw material.

I provided this background because I want to look at some of the companies now in the imitation cheese business and taking some liberties, try to classify them according to these categories as a basis for understanding why they are in the business. The major 10 producers and marketers of imitation cheese products are the following: Kraft, Fisher, Schreiber Foods, Anderson Clayton, Universal Foods, Beatrice, Borden, Swift, Galaxy, Sargento. There are other companies in this business, but these are the major ones. Schreiber Foods is considered to be the leader in this field and later we will explore some of the reasons for that. Anderson Clayton as many of you know, was one of the earliest companies in the imitation cheese business. By the way, I am going to use the word "imitation" as opposed to "substitute." I think most of you know the difference. To be called a substitute product a product much be nutritionally equivalent to the product being copied. A substitute cheese is an imitation cheese but not vice versa. Consequently, I am using the term "imitation" as a broader description of the products we are talking about.

The companies that have been motivated by "market needs" are Kraft and Fisher. Kraft has taken a look at its consumer and tried to evaluate whether or not there is a need for a healthy alternative to a natural cheese. They have tended to stress the low cholesterol, low saturated fat, corn oil aspects of the product, and have given it the name, Golden Image. They have priced it comparably to natural cheese or in some cases even higher. Their packages have the natural look. Their message to the consumer has been essentially that this is a healthy alternative. Fisher has stressed the low cost aspects of this product. To date there has been very limited advertising by firms in this group and the success of this approach has been limited--for reasons which I think will become clear in a minute.

In terms of the "production capabilities" driving force, Schreiber probably fits this better than anyone. Their secondary driving force would be a "products offered" one. They are in the cheese business and imitation cheese is considered in that category. Essentially, imitation cheese is made in a process quite similar to processed cheese. One uses the same kind of blending, mixing, cooking, forming, cooling, and packaging techniques as in processed cheese. So it makes some sense that if you have a primary strength in the manufacturing of processed cheese, you can utilize that technology, that production know-how, in making imitation cheese. It also fits with the low cost private label orientation. The imitation product becomes a stronger alternative as the market becomes enamored more and more with lower fat and lower priced products. The company is not tied to milk. They introduce the product at the retail level using the generic and private label route and stressing the lower price. It was introduced with margins similar to the natural cheese product. This will be an important point later on.

In terms of the "products offered" driving force, Universal Foods seems to fit this category. It is in the Italian cheese business in the United States. Their move in this direction was largely a defensive move. The primary imitation product has been an imitation mozzarella for a variety of reasons. The company viewed itself as providing a full line of Italian cheese products and so this imitation product helped fill out the line. It also is a way of defending against erosion of the natural mozzarella cheese market.

There is really only one company that could be classified as following the "raw material" driving force, Anderson Clayton. Being in the vegetable oil and fats business, Anderson Clayton tended to view this potential market for their raw materials as the next "margarine". Anderson Clayton is the only major fat-oil company in the imitation business at this time, a quite different situation than in the margarine market.

User Motivations

It's important to look at the size of the market, the types of products being sold, and where they are being sold to begin to understand why people are buying imitation cheese. Essentially the market has grown since its beginnings in the early 1970s to about 225 million pounds in 1982. Most of the product is sold in the industrial (55%) and food service (32%) markets, retail having a relatively small share (13%). Mozzarella is by far the dominant product, accounting for 75% of total imitation sales. Cheddar makes up another 16%. The mozzarella product is dominant because it is used as an ingredient in pizzas and Italian foods and dishes. It has the stretch and milk characteristics needed by manufacturers and since natural mozzarella used in these products is typically young and therefore, low in flavor, the imitation can be quite satisfactory. In short, mozzarella is the most imitable of the products and it has been the most vulnerable to imitation.

If we look at user motivation for purchasing, it boils down to really two major reasons: price or price and health (Figure 2). The health factor is really not a dominant reason. The primary reason is price. The price differential has been anywhere from 20 to 40 percent. That differential has come down in the last few years as the price of imitation raw materials has gone up faster than the price of milk. It is also important to understand some of the motivations for not using it (again, see Figure 2). The ones most often cited

have to do with the quality of the product (particularly flavor and texture concerns), manufacturers' concern about damaging the company's quality image, "truth in menu" restrictions, ingredient declaration restrictions, and the fact that they can not put "cheese" on their ingredient legend. A number of firms feel they can make more money by selling a higher quality product. Cheese already has a healthy image and so far the labels "imitation" or "substitute" are inconsistent with that healthy image.

FIGURE 2. User Motivation

Reasons for Purchase:

- lower price
- healthier

Reasons for Not Using:

- quality of product (flavor, texture)
- damage to company's quality image
- truth-in-menu restrictions
- ingredient declaration restrictions
- can make more profit selling quality
- cheese already has health image
- label "imitation" not consistent with health image

How do we define the market that imitations can reach? It is somewhat restricted. Basically it has been restricted to a subset of the ingredient cheese market. It is used on pizzas (mozzarella), in nachos, in salad bars, and on hamburgers and some sandwiches. It is used wherever ingredient cheese flavor is not a key characteristic, where menu and label considerations are not paramount, and where the manufacturer is concerned for the melt or stretch characteristics of the product or some other functional properties. This suggests that the imitation cheese market is limited. Its application and its growth has been in this restricted part of the marketplace. This brings me to the issue of why I think the imitation cheese market is not the same as the margarine market.

Imitation Cheese vs. Margarine

Cheese already has a healthy image. The consumer does not seem to be overly concerned with the cholesterol levels in cheese. As a matter of fact, the cholesterol issue seems to be decreasing in the 1980s after peaking in the early 1970s. As I mentioned earlier, the use of the words "imitation" and "substitute" are inconsistent with a healthful image and that has placed some restrictions on the market for imitation cheese. If you look at the label on natural cheese, it is very simple, straightforward, and connotes a healthy image. If you look at the ingredient legend on an imitation or substitute cheese, it is very lengthy, it has what a consumer would view as chemicals or additives in it, and it is confusing. It does not fit the image of health. A

second reason why imitation cheese and margarine are different situations, is that so far the industry has not been able to agree on a generic name for these products. Consequently, these products are being sold utilizing the words "imitation" and "substitute" predominantly. The importance of this is that when you sell an imitation product you should not disappoint the consumer; but so far it is perceived as a different product than the natural one. Without the use of a generic label like "margarine" you invite the consumer to compare this against the natural or real thing and you create false expectations. A third factor is that the flavor and texture of a natural cheese is far more complex than that of butter. The flavor chemistry is complex and it is quite a problem to make an imitation cheese taste like a natural cheese without using significant quantities of natural cheese. Texture is another problem. Butter texture is smooth and similar to a processed food, whereas a natural cheese is a fermented product with distinct particles or curds.

There are other considerations as well which differentiate margarine from imitation cheese. Butter is primarily used as an ingredient and so far imitation cheeses also have been restricted to that subset of the market as well. There are many varieties of cheese which people eat for their own enjoyment whereas this is not true for butter. Furthermore, there are many varieties of cheese which makes it more difficult to imitate. In addition, if you look at the early companies entering the margarine business they tended to be brand marketers and not heavily into the butter business. They priced the product with margins that supported advertising. This tends not to be the case in imitation cheeses. They are being priced similar to other cheese products for the most part and they are being introduced via generic and private label routes. There is not a lot of advertising support to convince the consumer of the product's advantages (other than price) and the health reason is not really important. Finally there are the various restrictions with regard to "truth in menu" and label restrictions that also make the use of imitation cheese difficult.

I am basically saying that the margarine and butter comparison is not an accurate one for imitation and natural cheese.

The Potential for Imitation Cheese

A recent study by Frost and Sullivan that has received much publicity, claimed that by the year 2000 imitation cheese will grab almost 50 percent of the market. I am obviously taking a different position. What do I think is going to happen? Let's take a look at what has happened to natural and processed cheese versus imitation cheese in the last six years (since imitation cheese has been around). During this period commercial usage of natural and processed cheese increased by 1028 pounds while imitation cheese usage rose by 220 million pounds (Figure 3). You had good steady growth in natural and processed cheese at about 5%+ a year (Figure 4). Imitation cheese has obviously had a much higher growth rate during this period of time. It started at virtually zero, so that is to be expected. The thing that is important to notice here is the rapid decline in imitations' growth rate. Partly it is to be expected because when you start from a small base you can not continue to grow at large rates, but it is interesting to note what has happened in the last two or three years to the imitation growth rate. Two hundred million pounds is not a large quantity of cheese and so there has been a significant falloff in the growth rate.

FIGURE 3. Imitation vs. Natural/Process Cheese Growth (million lbs. commercial usage) Absolute Growth 1976 - 1982

Natural & Process Cheese	1028
Imitation Cheese	220
Natural vs. Imitation	4.7 Times

FIGURE 4. Growth Rates 1976 - 1982

Natural/Processed Cheese	5.5% compounded/year
Imitation Cheese: High but Slowing	
1977	140%
1978	66%
1979	45%
1980	20%
1981	14%
1982	12%

The question of what is going to happen down the road remains. For the next five years, I think we will see the imitations continue to grow faster than the natural and processed cheese markets, starting out closer to the 12 percent rate and ending up down closer to an 8 percent rate. During the next 5 years I think it will level off to about the growth rate of natural cheese. If this does take place, the tonnage growth in natural and processed cheeses will continue to be higher than in imitation cheese products. This forecast is based on a number of factors.

We don't foresee a major technological breakthrough to solve the problems associated with imitation cheeses that restrict the market. So we feel that it will continue to have a limited market. The target market, much of which were the frozen pizza manufacturers, has been quickly saturated and filled. The rapid growth rate that the industry got from conversion of these people has taken place. The expectation of some that the foodservice industry will begin in a major way to convert over to imitation, I do not believe will happen in the near future. There is strong support out there for real cheese; it provides good quality and a healthy image in the foodservice area. This is a little bit of a different view than a number of other people have given. I do not mean to imply that imitation cheese does not have a place--it does, but do not expect it to grab the kind of large market share that margarine took from butter.

THE SOLIDS STANDARDS ISSUE

Robert D. Boynton

The issue is whether or not federal minimum solids standards for fluid milk products should be raised, or more specifically, whether or not to increase the minimum solids-not-fat (SNF) and total solids standards established by the Food and Drug Administration (FDA) for fluid milk products in interstate trade. Despite the fact that the Hayakawa Amendment specifying increased solids standards was not acted on in the last session of the Congress, the issue of increased solids standards is not dead. There appears to be considerable interest among dairy farmer cooperatives, some consumer organizations, and some members of Congress in increasing the minimum solids standards for fluid milk products.

I would like to address six questions related to the solids standards issue. First, what are the proposed standards changes? That is, what did the Hayakawa Amendment call for, and what did the National Milk Producers Federation (NMPF) offer as amendments to the Hayakawa plan. Second, have California's high solids standards led to increased consumption of fluid milk products in that state? Third, will more milk be sold in the United States if standards are raised? Fourth, are higher standards for fluid milk products enforceable? Fifth, should/must the federal government mandate higher standards? Lastly, what is the relationship between higher solids standards and multiple component pricing?

FLUID PRODUCT STANDARDS

Let's briefly consider the whole milk, lowfat and skim milk standards (Table 1). The current standards specified by the FDA call for 8.25% SNF in whole milk. Notice that California has an 8.6% standard and an overall or total solids standard of 12.2%. The Hayakawa Amendment, without changing the fat or SNF component, specified that total solids had to match the California level. In response, NMPF suggested that the SNF standard be increased to 8.75% and total solids to 12.0%. The concern that the NMPF had with the Hayakawa standards was that they were too wide open. First, the California Senator's plan allowed the total solids standards to be met by increases in either, or both, solids components. Second and perhaps most important, the Hayakawa Amendment did not specify the source of those added solids. NMPF's proposed amendment to the Hayakawa plan made sure that the higher solids would come in the form of higher SNF and that the source of those solids could not be lactose or other less nutritious solids or imported casein. Hayakawa apparently accepted NMPF's modifications.

Table 2 shows the lowfat milk standards. Again, notice that a major difference between the current standards and the ones NMPF proposed is in the SNF component--raising it from a minimum of 8.25% to a minimum of 10%. This matches

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TABLE 1. MINIMUM WHOLE MILK STANDARDS

	F.D.A.	CALIF.	HAYAKAWA (proposed)	N.M.P.F. (proposed)
FAT	3.25	3.4	3.25	3.25
SNF	8.25	8.6	8.25	8.75
TOTAL SOLIDS	[11.5]	12.2	12.2	[12.0]

TABLE 2. MINIMUM LOWFAT MILK STANDARDS

	F.D.A.	CALIF.	HAYAKAWA (proposed)	N.M.P.F. (proposed)
FAT				
Low	0.5	1.9	0.5-1.0	0.5-1.0
High	2.0	2.1	1.0-2.0	1.0-2.0
SNF	8.25	10.0	8.25	10.0
TOTAL SOLIDS				
Low	[8.75]	[11.9]	11.0	11.0
High	[10.25]	[12.1]	12.0	12.0

TABLE 3. MINIMUM* SKIM OR NONFAT MILK STANDARDS

	F.D.A.	CALIF.	HAYAKAWA (proposed)	N.M.P.F. (proposed)
FAT	$\leq$ 0.5	$\leq$ 0.25	$\leq$ 0.5	$\leq$ 0.25
SNF	8.25	9.0	8.25	9.0
TOTAL SOLIDS	[8.25]	[9.0]	9.25	9.25

* except as noted

the current California standards. The skim or nonfat milk standards are shown in Table 3. NMPF proposed to raise the SNF standard to 9.0% from the current FDA minimum of 8.25%.

THE CALIFORNIA EXPERIENCE WITH HIGH SOLIDS

What can be learned from the California experience with higher solids standards? It seems as though every time this issue comes up, regardless of what side of the issue one is on, California is cited as the basis for making a decision on the wisdom of raising the solids standards nationwide. In this section of the paper California's consumption characteristics will be examined first. Then I will suggest that any favorable consumption trends one sees in California could be explained by several factors besides the state's high solids standards.

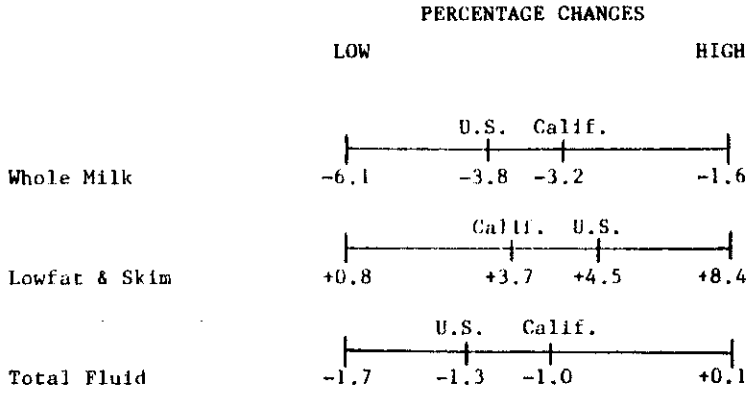
Consumption

Let's first consider per capita consumption trends in California. Figure 1 shows per capita consumption of fluid milk products in 1980--for the U.S., California, and for the particular region with the highest per capita consumption in 1980 (composed of aggregations of federal milk marketing order areas). For all 5 fluid product categories, California's per capita consumption exceeded the U.S. average. However, there was always at least one other region of the country that achieved higher per capita consumption in 1980 than California.

In Figure 2, for these same five fluid products, the ten year change in per capita consumption of fluid milk products in pounds is shown. Again, the U.S. average, the California performance, and that region of the country that had the most favorable change in per capita consumption in that ten year period are arrayed. Notice that California's performance exceeded the U.S. average, however, once again there is always one region of the country that registered better per capita consumption changes than did California.

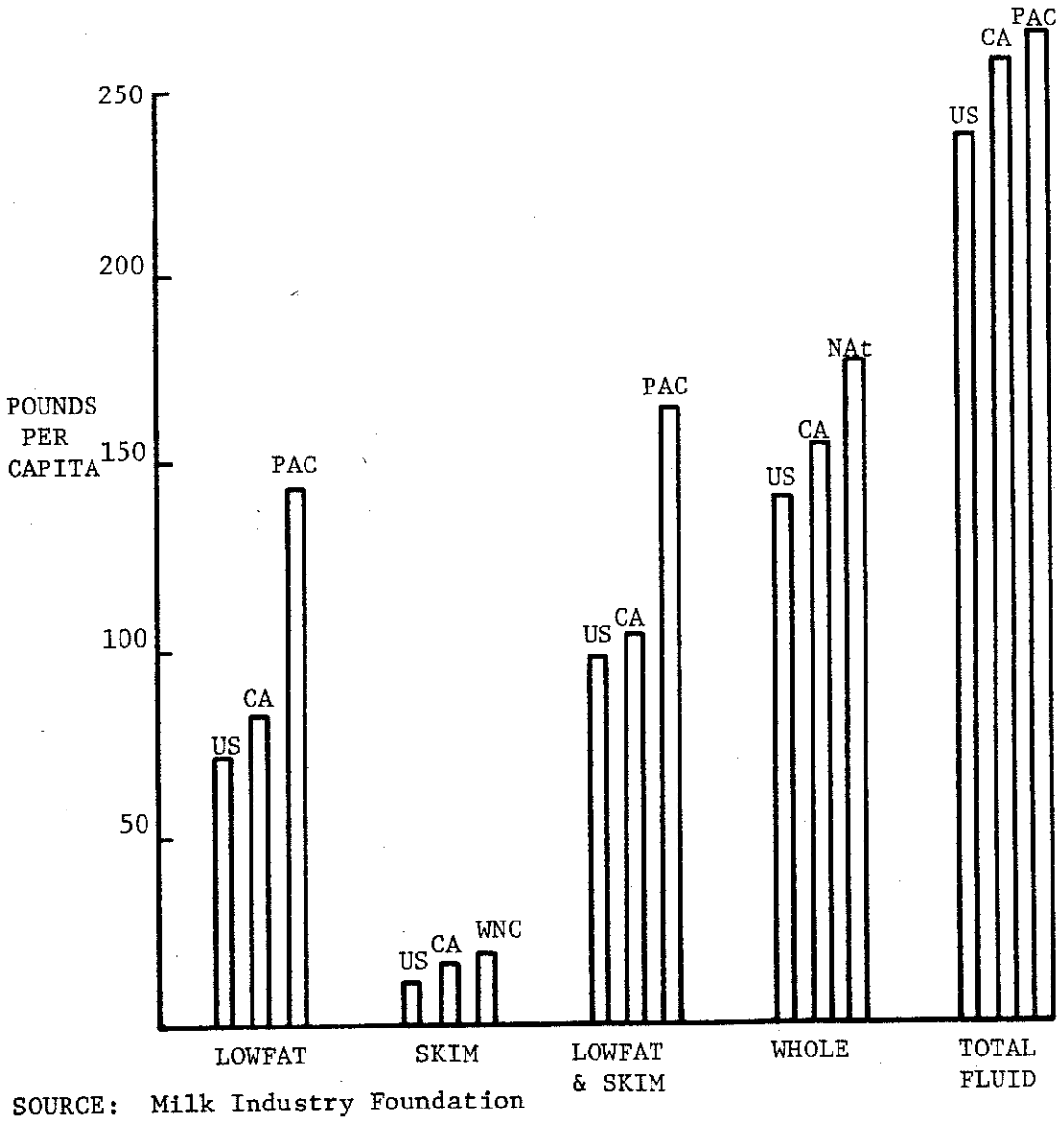
Taking one final look at consumption patterns in California, Figure 3 shows annual percentage changes in per capita consumption for the five year period 1975 to 1980 and looks at three classes of fluid products: whole milk, lowfat and skim, and all fluid products. On a percentage basis, once again California's

FIGURE 3. AVERAGE ANNUAL CHANGE IN PER CAPITA CONSUMPTION BY REGIONS, 1975-1980



SOURCE: Milk Industry Foundation

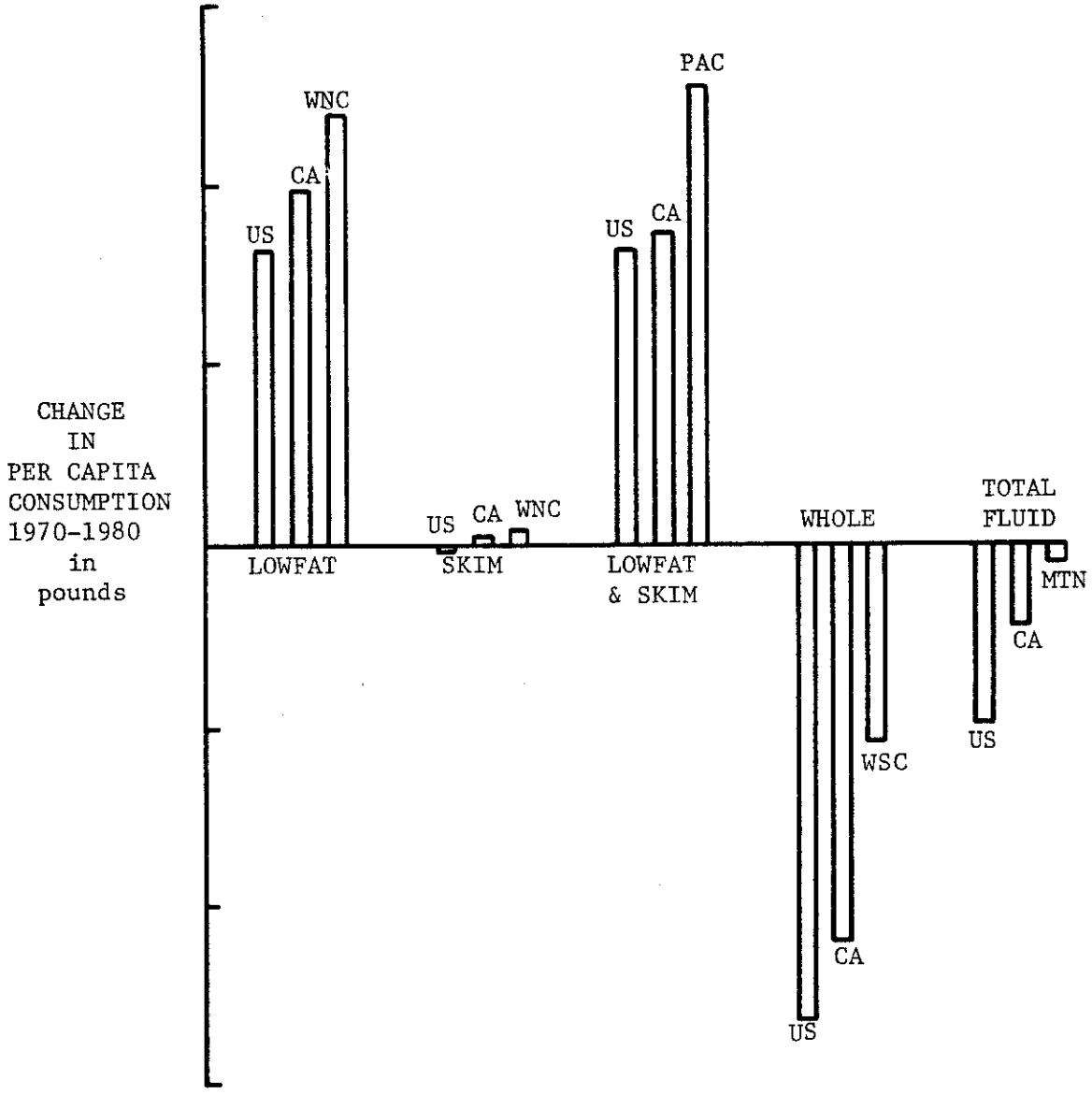
FIGURE 1. 1980 PER CAPITA FLUID MILK PRODUCT CONSUMPTION*



SOURCE: Milk Industry Foundation

* US = United States federal order average
CA = California average
PAC = Pacific federal order region; WNC = West North Central federal order region; NAt = North Atlantic federal order region

FIGURE 2. 10-YEAR CHANGE IN PER CAPITA CONSUMPTION OF FLUID MILK PRODUCTS*



SOURCE: Milk Industry Foundation

* US = United States federal order average
CA = California average
WNC = West North Central federal order region; PAC = Pacific federal order region; WSC = West South Central federal order region; MTN = Mountain federal order region

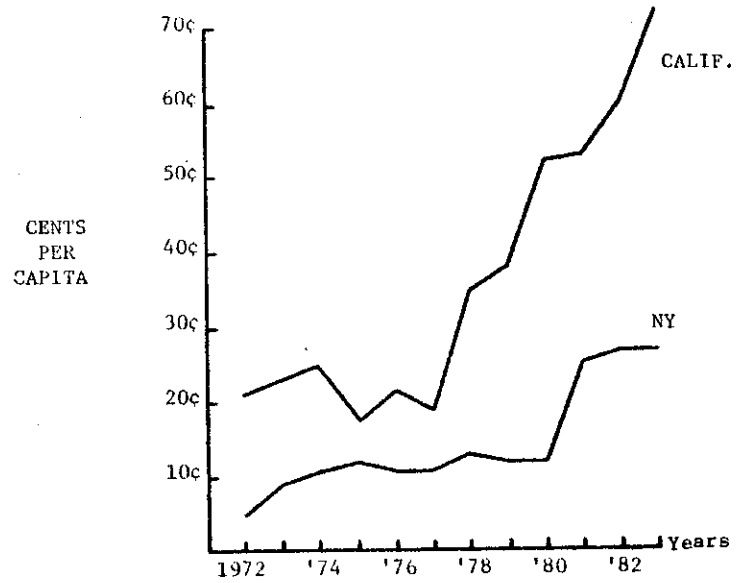
whole milk consumption performance lies somewhere between the U.S. average and the performance of the best region of the country. But, for lowfat and skim, California's 3.7% rate of gain on an annual basis was not as good as the U.S. average of 4.5% and was less than half the rate of gain achieved in the best region of the country. For total fluid product consumption, again California is slightly better than the U.S. average, but still in decline and still below the performance of the best region of the country.

Regardless of one's assessment of California's consumption performance, caution must be exercised in attributing performance to any particular factor. I would submit that there are at least three factors other than higher solids that might explain their consumption performance*--California's high rate of advertising, their strong milk quality program particularly at the farm level, and the state's favorable demographic characteristics in the last ten or fifteen years relative to other parts of the country. Each of these will be examined briefly in turn.

Advertising

Figure 4 depicts per capita expenditures on in-state advertising and promotion for the period 1972-1983 for California and New York state. Notice that on

FIGURE 4. PER CAPITA EXPENDITURES ON IN-STATE ADVERTISING & PROMOTION 1972-1983



SOURCES: California Milk Advisory Board.
Stavins and Forker.
NYS Promotion Order Budget, 1980-83.
Population estimates from Shahbazian and Brooks (California) and Dairy Industry Services (NY).

* Some students of the dairy industry claim that consumer prices for fluid milk products have been low relative to other parts of the country, further favoring high per capita consumption in that state. No comprehensive, reliable data were available to allow me to objectively evaluate this claim, however.

a per capita basis, California farmers' contribution to advertising exceeded New York's in every year with the discrepancy between the two states growing wider over the period. In 1983, California producers will spend on the average, 73¢ per person in the state on in-state advertising and promotion compared to New York State's 27¢ per capita. Since per capita media costs vary greatly from city to city the results achieved with a given per capita advertising level will also vary. Consequently, per capita advertising expenditures do not directly correlate with advertising effectiveness. Despite this potential difference between the two states, it seems likely that California has achieved greater advertising coverage than has New York over this 12-year period. This could easily explain all or part of any favorable consumption trends in California.

Milk Quality

Since 1969 California has required a recording thermometer on all Grade A bulk tanks. That recording thermometer is used by the tank truck driver to downgrade any milk not cooled quickly enough or kept at the required level. California's rule states that within two hours of completion of the first milking or four hours after the start of the first milking (whichever occurs first) the milk in the tank has to be below 50°F and at no time after that can the temperature of the milk rise above 50°F [Lockhart]. This and other quality control efforts in California plus their favorable climate and processors' long-time concern for milk quality have led quality experts to conclude that California's milk quality is among the highest in the nation. One might attribute all or part of any desirable consumption trends one sees in California to high levels of milk quality.

Demographics

Finally, demographics might also explain some of California's consumption performance. In general, California has a younger population than many of the other regions of the country. Also the percentage of its population which is nonwhite is lower than most other regions.*

THE EFFECT OF HIGHER SOLIDS ON SALES

If standards were raised in the manner suggested by NMPF to closely match those in California, would more milk be sold? Some would more specifically ask, would more SNF be sold? The first question that always comes up in this regard is the issue of taste. Will fluid milk products taste better and if so will consumers be willing to pay more for the improved products. Unfortunately, very little well-designed, objective research on consumers' taste preferences for high solids milk exists. Most of what is available has been done on either a very limited basis or was done many years ago. It would appear that consumers can detect taste differences when SNF test varies by one point or more and they prefer the higher solids product. In a 1963 Arizona study, 55% of surveyed consumers said they would be willing to pay up to 2¢ more per half gallon for this high solids milk [Hillman, Stall and Angus]. Total milk sales volume for the test and control distributors in the market experiment were unaffected. This maintenance of sales levels in the face of higher prices for the fortified

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* While California has enjoyed a racial mix favorable to milk consumption, large numbers of Southeast Asian immigrants since 1980 will reduce the state's demographic advantage.

product in some stores lends some support to the improved taste hypothesis. Given the age of the study, its limited scope, and most importantly, its design (both high solids and regular solids products were available for purchase in each store), I am reluctant to assume that total fluid volume would remain unchanged in the face of nationwide, comprehensive fluid product price increases. I choose the conservative approach of assuming that no taste effect would obtain and that consumption of fluid products would respond according to the applicable demand elasticities and product price changes. To the extent that a taste effect would obtain, the analysis which follows represents pessimistic sales projections.

Let's first look at some estimates of cost and price changes for three fluid milk products as a result of increasing the solids standards. Cost estimates vary, but within a fairly narrow range we can estimate that whole milk would probably increase in ingredient cost about 1¢-2¢ a gallon, lowfat about 10¢-12¢, and skim milk about 2¢-4¢ (Table 4) [see Ballard and Vitaliano; Goold; Jacobson; Stammer]. Translating these ingredient cost changes into price changes proves to be difficult for at least two reasons. First, there are cost changes arising from the higher standards other than from changes in ingredient costs. There would be changes in labor costs and equipment costs and these are a bit more difficult to factor in [see Ballard and Vitaliano]. But perhaps the factor making the prediction of price changes most difficult is the pricing strategies used by retailers for fluid milk products. If one looks at the current price differentials between these three products in most retail grocery stores, one will find that the price differences are much less than would be suggested by differences in ingredient costs. That is, based on ingredient costs, lowfat and skim milk would be priced considerably less than they currently are relative to whole milk. Consequently, some have suggested that, faced with a mandatory increase in solids, wholesalers and retailers would simply maintain the current price differentials among these three products [Stammer]. If they did this, price changes for all three products would be minimal, equal to about what the whole milk price change would be. In the process, the processing and/or retail sectors would have to absorb most of the extra ingredient cost. Others have suggested pricing mix changes which result in a spreading of the ingredient (and other) cost changes over all three products.

What I have tried to do here is to look at some reasonably conservative price changes and some fairly dramatic price changes to hopefully bracket those that might occur. The own-price elasticities of demand used here for these three fluid milk products are those estimated by Boehm and Babb in a 1975 study. The short-run elasticities in the last column of Table 4 are typical of those found in other studies of fluid milk demand. The long-run elasticities are quite large and atypical for what we usually think to be the case with fluid milk products. I have chosen to use those long-run elasticities as an extreme measure of the price effect.

Table 5 shows the changes in total fluid sales volume, butterfat sales, and SNF movement as a result of these four combinations of minimum and maximum price changes and long-run and short-run elasticities. In the first column of Table 5 are the projected decreases in total fluid sales volume. Assuming the biggest price increase and using the long-run elasticity, fluid sales are expected to fall almost 8% over the 1981 levels; at the other end of the spectrum examined,

TABLE 4. ESTIMATED COST AND PRICE INCREASES FOR FLUID MILK PRODUCTS

	INGREDIENT COST CHANGE ESTIMATES	PRICE CHANGE ESTIMATES	OWN-PRICE ELASTICITIES	
	------per gallon------		Long Run	Short Run
WHOLE	+1 - +2¢	+2 - +8¢	-1.7	-.38
LOWFAT (2%)	+10 - +12¢	+8 - +12¢	-1.33	-.55
SKIM	+2 - +4¢	+4 - +8¢	-1.82	-.12

TABLE 5. ESTIMATED CHANGES IN U.S. SALES OF FLUID PRODUCTS, BUTTERFAT AND SNF, COMPARED TO 1981 LEVELS *

		CHANGE IN TOTAL FLUID SALES VOLUME (percentage)	CHANGE IN BUTTERFAT SALES ** (million lbs.)	CHANGE IN SNF SALES (million lbs.)
NO CHANGE IN 1981 SALES		-0-	-0-	+296.5
SALES DROP (MIN. PRICE CHANGE)				
	LR	-3.5%	-27.7	+137.5
	SR	-1.2%	-8.3	+241.9
SALES DROP (MAX. PRICE CHANGE)				
	LR	-7.9%	-80.1	-49.7
	SR	-2.3%	-21.2	+191.2

* California excluded

** Lowfat milk assumed to contain 1.068% butterfat on average and skim milk to be 0.304% fat. These figures were average tests of final products in 15-market Federal Milk Market Administrator Service Unit No. 1 study.

a fairly modest but still significant sales loss of 1.2% occurs with the smallest price change and the short-run elasticity. The long-run butterfat sales drop from the maximum price change would be about 80 million pounds compared to 1981, while in the short run with the minimum price change, the estimated loss in butterfat sales is just over 8 million pounds. These losses in butterfat sales result not from changes in the butterfat standards (because virtually no changes in the current FDA fat standards were proposed) but rather because total fluid milk consumption would go down.

Proponents of higher minimum solids standards argue that some of the nonfat dry milk powder building up at a rapid rate in government warehouses could be used to fortify fluid milk products. As the data in the last column of Table 5 suggest, under most conditions more nonfat dry milk could be used commercially if the solids standards were raised, but at the expense of fluid and butterfat sales. The magnitude of the extra movement of SNF could be considerable but not of a magnitude sufficient to quickly reduce the current government stockpile. To put this in perspective, the largest change in SNF sales shown in Table 5 is just under 300 million pounds or a little less than a quarter of the current government stockpile. (This would be expected to obtain if the price effect was exactly offset by the taste effect, resulting in no change in sales from the 1981 level.) When no taste effect is assumed, the extra SNF sales are, of course, even less. Notice that in the case of the largest price increase and using long-run elasticities, sales of total non-fat solids actually decline rather than increase over the 1981 situation.

THE ENFORCEABILITY OF HIGHER SOLIDS STANDARDS

In 1982, the solids content of fluid milk products was studied in fifteen federal order areas in the central U.S. [Fed. Milk]. Among other things, it was discovered that 53% of the whole milk sampled did not meet the minimum butterfat requirement. Also, the SNF test of final fluid products was less than the test of producer milk in all of the nonfortified products tested. Finally, it was found that from 23% to 86% of the studied handlers in these 15 markets produced fortified products which did not meet their own fortification claims (based on comparisons with the test of the producer milk used). It would appear that there is some reason for concern regarding compliance and enforcement.

Apparently California has tighter control. Staff in their state agency responsible for standards enforcement believe they are getting about 85-90% compliance on fluid milk products [Lockhart]. They likely do a number of things a bit better than they are done in the rest of the country. On an unannounced basis, products are sampled and tested from every plant in the state at least four times every six months. The penalties for violations are apparently fairly effective. In my opinion, if mandatory higher standards are an idea whose time has come, the enforceability issue should not hold up the implementation of higher standards. It would appear that enforceability can be improved to the point where compliance is not a serious problem. Undoubtedly, this will be a more costly process than the current one.

SHOULD THE FEDERAL GOVERNMENT MANDATE HIGHER STANDARDS

I would like to address this issue apart from the question of any economic gains or losses. That is, regardless of the changes in sales of nonfat dry milk, butterfat, or total fluid products, does it make sense for the government

to mandate higher standards. There are at least three points to make in this regard. First, in some ways this is a philosophical question which turns on the issue of free markets and government intervention. Do we want to rely on the market to determine the product mix available or is it necessary for the government to mandate the type of products that are offered for sale? Related to this of course, is the freedom issue. Should consumers be free to choose from a variety of products or should fairly high minimum standards be mandated so that some consumers are not able to exercise their option to buy a lower solids product if they wish? Obviously, there is no simple answer to this question, but it is important to recognize that for some the issue turns on this question.

The second issue here is nutrition. Does it make sense to mandate better nutrition? To some it does but to others it does not. Unless the change in tastes is strong, it would appear that less fluid milk products would be sold. For some, the increase in price will cause them to stop purchasing fluid milk products. Will the aggregate level of nutrition in this case really be heightened by higher solids?

The third point--and it is related to the other two--is the question of market failure. That is, has the market failed to give consumers the kinds of products they really want? I would only offer this observation. In the period from 1969-1981, the percentage of fortified lowfat and skim milk products sold in federal order markets fell from 76% to 20% [MIF, p.35]. That is, the market was offering fortified lowfat and skim products but consumers support for them waned. This suggests to me that the market had a chance (and still does) to support high solid products but perhaps consumers do not prefer those products or at least do not prefer them enough to pay the required premium.

I am aware that there might be reasons to think that the market would have some difficulty supporting high solids milk, namely milk's homogeneous nature and the concomitant problems of informing consumers of product differences (establishing unique fluid product identities) in what is, in most localities, a very competitive environment. Notwithstanding these potentialities, the market did support high solids products well at one time, but these products lost ground due to the rising cost of fortification ingredients. To me this does not suggest market failure.

To this point the discussion has been at a very aggregate or general level. It might be well therefore, to point out that in all likelihood there is a market for high solids fluid products. Properly segmented and developed, fortified products could likely be effectively (read, profitably) marketed to that consumer segment desiring rich or gourmet-type products (as Borden's is apparently attempting to do now with their lowfat line). Creative marketing can be expected to turn up such opportunities and such aggressiveness is badly needed in fluid milk markets.

SOLIDS STANDARDS AND MULTIPLE COMPONENT PRICING

It seems to me that if either multiple component pricing or increased solids standards are to be mandated, they probably both should be. California raised their solids standards in 1962 and then in 1965 installed multiple component pricing for Class I milk. Multiple component pricing for the other classes came somewhat later. If either of these changes are made without the other, equity problems are likely to emerge and disorderly market conditions probably

are inevitable. If higher SNF are mandated, the nonfat solids standards should be set at or above the average test of producer milk, so that most handlers do not have to incur ingredient costs which are not recoverable in the wholesale/ retail market.

It seems to me that if we leave this issue of solids and multiple component pricing to the marketplace, more and more cheese plants will implement multiple component pricing (butterfat and protein, for example) with the gains being divided between the parties. In fluid product markets, multiple component pricing is unlikely to develop voluntarily. Any handlers who successfully market high solids products will not likely share their gains with producers via multiple component pricing, however, farmers would benefit whenever handlers used nonfat dry milk powder or condensed skim milk to produce fortified products.

Fluid milk processors are understandably concerned about increasing the solids standards. Three reasons are frequently mentioned. First they are concerned about the inequities that would arise if standards were raised without multiple component pricing. For example, one handler whose farmers deliver him milk that is very high in SNF might not have to purchase any additional SNF to meet the minimum standards. Another handler who does not receive high solids producer milk would have to purchase additional solids in the form of condensed skim or nonfat dry milk powder. A second concern is that some processors, as a result of retail pricing strategies and consumer preferences, might be forced to absorb some of the extra ingredient costs from fortification, as was suggested earlier. Third, a number of the fluid processors are concerned about a drop in fluid sales volume upon imposition of higher standards. It seems that a well-designed multiple component pricing plan could relieve the equity concern of processors, however, the other two concerns would likely remain.

CONCLUDING COMMENTS

I have attempted to address a number of questions related to the solids standards issue. I believe it is a very important issue and one which will come up again, if not this year, then in the next few years. I think there are a number of things the industry should think about before pushing for higher solids standards. I would hope that the industry would not be persuaded to adopt higher standards because of the government's current stockpile of nonfat dry milk powder. This is not a quick way out of that problem. Moreover, what these changes might do in the long run to fluid markets must be carefully considered. Finally, I think caution is in order regarding any assumptions about the improved acceptance of higher solids products by consumers.

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HEALTH AND DIET CONCERNS: IMPLICATIONS FOR DAIRY PRODUCT CONSUMPTION

Christine M. Olson

Today we will discuss diet and health concerns and their implications for dairy product consumption. I'm going to do this from a consumer point of view. I'm not going to make any judgements as to whether consumers' perceptions about diet and health are correct or incorrect. I just want to share with you what's on consumers' minds, particularly in regard to diet and health, and how some of these diet and health concerns may have recently been affected by economic uncertainty.

Within the last decade, consumers in the United States have demonstrated more vividly than ever before an increased awareness of the relationship between the food a person eats and the development of various diseases. This awareness has been documented in several surveys beginning in the early 1970's including surveys done by the Food and Drug Administration and surveys done by private research groups. What's more, Americans have reported that they are changing their diet because of these concerns about diet and health. Forty two percent in one survey reported they were reducing their calorie intakes in order to lose weight [1]. Half of the people in one study reported they were cutting down on cholesterol [2]. About the same proportion in another study reported stopping or cutting back on the use of high sugar foods [3].

One of the most recent of these national surveys that has been directed toward the health and diet concerns of consumers as they've been expressed in the '70's is a second Woman's Day FMI Family Food Study. The title of this survey is Nutrition Versus Inflation--the Battle of the '80's [4]. I'd like to talk to you about this survey because I think it will give you an idea of the nature of the health and diet concerns consumers have; and since this is one of the more recent of these studies, I think it would be useful to examine its findings. The research was conducted by the market research firm of Yankelovich, Skelly and White who, according to people in the business, is very good at doing this type of research. They've used a national projectable sample of consumers--twelve hundred and some men and women eighteen years and over. The female to male ratio of the sample was 75:25. The people were interviewed in the Winter of '79-'80 and this survey is referred to as the 1980 survey in the charts.

Generally the results of this survey show that people see the primary importance of nutrition as a way to avoid future health problems. More people say that than say they think the reason nutrition is important is because it makes you feel good now. Nutrition in most people's eyes is seen as having very long-term benefits. The type of health and diet concerns that were specifically mentioned are shown in Table 1. People were asked to pick as many as they wanted from the list of concerns and so the possible maximum response to any one of the listed items could be a hundred. I've listed only those that at least

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50% of the consumers stated as being important. Interestingly, at the top of the list is "making sure that food in the supermarket is fresh." Next and maybe it's representative of our times is "getting enough rest and being able to relax." I guess that indicates that we are, as a population, somewhat stressed and people see stress as being related to health. "Taking care of the teeth" is high on the list. Next we see "getting enough exercise" which is certainly part of the whole weight control area. "Eating a balanced diet and maintaining the right body weight" are next.

TABLE 1. TYPES OF HEALTH-RELATED CONCERNS

Concern	%
Making sure that food in the supermarkets is fresh	69
Getting enough rest	61
Being able to relax	60
Taking proper care of teeth	59
Getting enough exercise	59
Eating a balanced diet	57
Maintaining the right weight	56

SOURCE: Second Woman's Day/FMI Family Food Study. Nutrition Vs. Inflation: The Battle of the Eighties. New York: Woman's Day, 1980. 200 pgs.

FMI and Woman's Day do a similar survey about every two years and they asked this same question in a survey they did in '77-'78. In doing the comparison there were some big losers and some big winners in terms of change over time. One of the big gainers, but one which was big in '78 and even bigger in '80, was "maintaining the right weight." One concern that seems to be leveling off is the concern over cholesterol. In 1978 about 36% said it was an important health concern. In '80 about 38% said it was an important health concern. Also on these lists is "drinking enough milk" and consistently in '78 and '80 about 28% of the people said that drinking enough milk was one of their diet and health concerns.

The survey teams then asked the consumers which component or aspects of food they were particularly concerned about. Consumers could respond by stating they were very concerned about this aspect of food, fairly concerned, or not concerned at all. Again we see the "quality" aspect of foods as a primary concern. The "quality" of the food in the supermarkets was of primary importance to consumers. We see the "use of pesticides and additives in foods" as concerns. And then, and this would go along with the concern about maintaining the right body weight, about a third of the people said that the calorie content of foods was an important aspect of foods of concern to them.

Thus far we have seen that people have certain diet and health-related concerns and we have seen they have concerns about specific components or aspects of the food supply. The researchers then asked consumers what they were doing about these concerns. In other words they asked "Have you changed in any way because of your concerns?" And in 1980 people reported changing their habits in ways shown in Table 2. They said they were doing more to watch their weight and they were doing more to watch calories. These two, I think,--and also the third--getting more regular exercise would go together as part of being related to the whole concern for maintaining the ideal body weight. Not only are people concerned but they are doing something about it. They are also reading more nutrition books. So overall, if you put the information presented thus far together, one of the strong trends that emerges is a concern among the population for body weight--attaining and maintaining that ideal body weight.

TABLE 2. CHANGES IN EATING, DRINKING, SHOPPING AND PHYSICAL FITNESS HABITS IN COMPARISON TO LAST YEAR:

	%
Doing more to watch weight	42
Doing more to watch calories	38
Doing more regular exercise	26
Reading more nutrition books	25

SOURCE: Second Woman's Day/FMI Family Food Study. Nutrition Vs. Inflation: The Battle of the Eighties. New York: Woman's Day, 1980. 200 pgs.

This trend is supported by the numbers of dieters in both the '78 and '80 surveys. About 20% of the consumers reported that they had started or stayed on a weight reduction diet within the last two weeks. Dieters differed from consumers in general. Table 3 shows some of the specific ways that dieters differed from other consumers. Dieters were more likely to count calories. They buy and use low calorie soda. They use more skimmed or low fat milk products. They use special diet foods and they use artificial sweeteners. Certainly, I think, there's no way to ignore the fact that the weight consciousness of society does have some impact on the type of dairy products consumed and it shows up in consumer surveys.

TABLE 3. IN 1978 AND 1980, 20% STARTED/STAYED ON DIET IN LAST TWO WEEKS. COMPARED TO CONSUMERS IN GENERAL, DIETERS WERE MORE LIKELY TO:

Count calories
Buy low calorie soda
Use skimmed or low-fat milk
Use special diet food
Use artificial sweeteners

SOURCE: Second Woman's Day/FMI Family Food Study. Nutrition Vs. Inflation: The Battle of the Eighties. New York: Woman's Day, 1980. 200 pgs.

Going back to consumers in general, the Yankelovich, Skelly and White survey team asked people, "What are you eating more of, and what are you eating less of?" A few dairy products show up on the lists, namely in terms of eating more. Consumers report eating more cheese and eating more yogurt, as shown in Table 4. I don't know, that for weight conscious consumers that increased cheese consumption is entirely consistent with trying to lose weight. The increased cheese consumption has been shown in other kinds of studies too. The yogurt trend is interesting and it's been shown in other studies too.

TABLE 4. IN COMPARISON TO LAST YEAR, CONSUMERS REPORTED EATING MORE:

Chicken, Salads and Greens, Fresh Fruit, Fruit Juice, Cheese, Raw Vegetables, High Fiber Foods, Margarine, Fish, Yogurt, Rice, Coffee

SOURCE: Second Woman's Day/FMI Family Food Study. Nutrition Vs. Inflation: The Battle of the Eighties. New York: Woman's Day, 1980. 200 pgs.

Table 5 shows the kinds of things that people report eating less of. I think it's interesting that you're seeing less colas and soft drinks. At least in the youth market, I think you'd have to say these are competitors with milk. So it's interesting that in this study consumption was reported as being less. The only dairy product on the list is butter.

TABLE 5. THEY REPORTED EATING LESS:

Cakes and Cookies and Sweets, Potato Chips and Like Snacks, Bacon, Colas and Soft Drinks, Nuts, Butter, Frozen Dinners, Canned Fruits, Red Meat, Potatoes, Sandwiches, Bread

SOURCE: Second Woman's Day/FMI Family Food Study. Nutrition Vs. Inflation: The Battle of the Eighties. New York: Woman's Day, 1980. 200 pgs.

Although the logic may seem somewhat circular, the survey researchers wanted to see if consumers were consistent in their responses. Consumers said they had concerns; they said they'd changed. So to see if there was some consistency in the nature of consumer responses, the researchers asked the consumers, "Why did you make the changes that you were reported making?" And in 1980 the results showed that 40% making these changes to improve their diet; 34% to save money; 11% to save time and 16% weren't sure why they'd changed. Overall the results were consistent.

The researchers thought it would be interesting to see how these results on why consumers changed compared to 1978. In '78, 75% said the reason they'd made changes in their diet was to improve their diet and only 25% said to save money. Unfortunately in '80 they added other possible responses, but if you just look at only the people who said to improve diet or save money, in 1980 this is about

a 50/50 split here. So, it seems that between '78 and '80 the motivation of changing to improve your diet was lessening but the changing to save money was increasing.

Knowing this trend, when FMI and Woman's Day did their third semiannual survey, they focused on the impact of economic uncertainty on lifestyles, including dietary intake [5]. And, again, they used the same national projectable sample and Yankelovich, Skelly and White conducted the research. This survey was reported by Dr. Timothy Hammonds who works with Food Marketing Institute (FMI) at the 1983 Ag. Outlook Conference in Washington, DC. Two out of three consumers in this last study, reported that they had changed their diet in some very significant way. The major reason for change was to save money. So, I think Dr. Hammonds said it very well at the Ag. Outlook Conference when he said, "Saving money is the prime motivator today. This does not mean that health and nutrition concerns have been completely submerged. These concerns are indeed still motivating behavior changes and will continue to do so in the future. It simply means that the current has been overwhelmed by the tidal wave of economic uncertainty for the time being" [6].

In this survey researchers asked consumers what they were doing more of and what they were doing less of. I think you'll see some items in Tables 6 and 7 that have some definite implications for dairy product consumption. People report paying more attention to unit pricing, using coupons more, using a shopping list when they go to the grocery store. They report they're paying more attention to the nutritional label on food products and they're putting things back on the shelves when they look at the labels and discover the product isn't something they want. They report eating together more as a family. I think for families with children, milk is seen as an integral part of family meals. So this may have some implications for dairy product consumption. Consumers also report that they are doing less of some things. They said they were eating more family meals. They also say they are eating less at fast food restaurants. I don't think milk is necessarily viewed as part of a fast food meal so this trend has implications for dairy product consumption.

TABLE 6. IN 1982, CONSUMERS ARE DOING MORE OF THESE:*

Pay attention to unit pricing
Check newspaper and magazines for coupons
Go food shopping with a list
Pay attention to nutritional labeling
Eat together as a family
Buy unadvertised specials
Buy the stores' own brand
Try new products
Shop in same supermarket as previously
Buy no-name products
Have the same brand preferences

* Items are listed in order of importance

SOURCE: Hammonds, T. Understanding consumers in today's food marketplace: A research report. In: New Challenges for Nutrition. Fifth Food Policy Conference. Washington, D.C.: Food Marketing Institute and Community Nutrition Institute, 1982, pp 14-49.

TABLE 7. IN 1982, CONSUMERS ARE DOING LESS OF THESE:*

Buy gourmet foods
Eat at fast food restaurants
Serve pre-cooked foods bought at store
Serve any food at any meal
Send another family member for main shopping
Make an impulse purchase
Skip meals
Buy well-known advertised brands

* Items are listed in order of importance

SOURCE: Hammonds, T. Understanding consumers in today's food marketplace: A research report. In: New Challenges for Nutrition. Fifth Food Policy Conference. Washington, D.C.: Food Marketing Institute and Community Nutrition Institute, 1982, pp 14-49.

I want to pick up on one of the trends that was reported here - that consumers are doing more of and that is label reading. As many of you may know, the Food and Drug Administration is considering developing a new format for the nutritional label of food products. Since consumers are reporting that they're paying more attention to nutritional labels I think it would be very useful then to look at what's on nutritional labels and how consumers feel about these particularly in comparison to nutritionists and members of the food industry. The Division of Consumer Studies of the FDA [7] recently did a survey of all the members of the American Institute of Nutrition (AIN). AIN is the professional organization for experimental nutritionists in this country. They also polled some members of food industry organizations. The organizations they surveyed were the American Bakers Association, the American Meat Institute, the Food Marketing Institute, the Grocery Manufacturers of America, the Milk Industry Foundation, and the National Food Processing Association. The author of this research makes no claim that these industry groups are representative statistically of the food industry itself, but these were the groups that they surveyed. They also surveyed consumers. They had a small consumer panel in 1980, when they did the majority of the research. They also had a nationally representative consumer panel from 1978 of which they asked some of the same questions. One of the key questions the researchers asked was, "How useful are various components of the nutritional label from the perspective of utility to consumers?"

Table 8 shows how the items were rated. If an item on the label was considered very useful it got a score of a hundred; if of some use, it got a score of fifty; and if of little or no use, it got a score of zero. There were 531 people in the AIN survey. In general consumers tend to rate everything as being more useful to them than either the food industry did or the nutritionists that belong to AIN did. Now let's look at some specific types of information that are on the nutritional label. Not surprisingly, given what we've said about the weight consciousness of Americans, every group stated the calorie information on the nutritional labels was the most important piece of information. The consumers rated sodium information as being as useful to them

as calorie information. That was not true of the AIN membership or the food industry. And you can see that the importance of sodium information has changed from '78 to '80 in consumers' minds. Fat in consumers' eyes is just about as important as sodium and calories. It falls in the same order among AIN members. That's not quite true if you look at the order in the food industry group. That group puts protein as being the second most important item on the nutritional label.

TABLE 8. UTILITY OF NUTRITION LABEL INFORMATION TO CONSUMERS

Type of Info.	AIN	Food	Cons.	Cons. 1978
Calories	94	92	95	87
Sodium	81	70	95	73
Fat	80	73	88	77
Protein	78	76	87	81
Iron	70	54	75	74
Calcium	67	52	72	64
Carbohydrates	62	70	80	72
Polyunsat. Fat (%)	56	37	76	64
Saturated Fat (%)	53	40	77	63
Cholesterol	55	44	80	74
Mean	43	32	53	46
N	531	177	107	884

Very Useful = 100; Of Some Use = 50; and Of Little Use or Don't Know = 0

SOURCE: Heimbach, J.T. and Stokes, R.C. Nutrition labeling and public health: survey of American Institute of Nutrition members, food industry and consumers. American Journal of Clinical Nutrition 36: 700-708, 1982.

In regard to carbohydrates, polyunsaturated fats, saturated fats and cholesterol, consumers rate these as being much more important than either the AIN or the food industry did. I don't know who's right and who's wrong and I'm not going to even make any guesses, but I think it is interesting to note that there are some distinct differences across the groups. I do think the fact that the label format is being revised right now means that information like this will be used in whatever revisions are made. Label information could potentially influence the purchase and consumption of certain types of foods, including dairy products.

In summary, this is a time of some interesting changes. Like Dr. Hammonds, I don't think consumers' concerns about diet and health will disappear. However, it does seem that economic concerns are looming more important than they have earlier.

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7. Heimbach, J.T. and Stokes, R.C. Nutrition labeling and public health: survey of American Institute of Nutrition members, food industry and consumers. American Journal of Clinical Nutrition 36: 700-708, 1982.

STATUS OF MILK QUALITY IN NEW YORK STATE

David K. Bandler

In 1975, Class I sales dipped below 50 percent for the first time since World War II. With production fairly constant over that period, lagging consumption is the real culprit. While milk still remains the leading beverage with babies and young children, milk drinking falls off fast as people grow up. Among the total United States population, milk is the fifth place beverage. It is currently surpassed by: water, soft drinks, coffee and beer.

Why have fluid milk sales slipped? Many factors are cited, including the consumer's response to the cholesterol issue, advertising, price competition from other beverages and changes in population (demographics). Often overlooked is the consumer's response to flavor and keeping quality. These often enter into the decision to buy or not to buy fresh fluid milk.

The flavor of fresh, high quality milk is delicate and any change in this perception is generally termed an off-flavor. This may result in reduced consumption or outright rejection. Fresh milk is a dynamic biological system containing many active enzymes that can cause unwanted changes. It is also an ideal medium for bacterial growth that can result in quality loss. In addition, methods of handling milk may contribute to the decline along with the natural tendency for milk to deteriorate with time.

Proper processing significantly improves quality and extends shelf-life. However, the ever continuing changes in methods of collection, transportation and storage prior to pasteurization, together with variable handling procedures in the market place have resulted in a finished product that is often less than perfect. This may adversely affect consumption and perhaps totally negate any promotional efforts.

The current research-extension effort is a spin-off of a comprehensive (1973-75) Milk Quality Study in the New York Public School System. It was found that school children drank 30% less when the milk had high proportions of rancid tasting milk. Further investigations showed that the problem was wide-spread particularly as milk reached the end of its shelf-life period. This has been quantified by the use of the Acid Degree Value test and the American Dairy Science Association milk flavor scoring system.

The average acid degree value* for New York farm milk in 1981 was .92 (See Table 1). It has shown a steady increase since data was first collected in 1975. The principal causes are: 1) pipeline air leaks, 2) pipeline risers, 3) excessive foam and 4) freeze-on bulk tanks. High numbers of psychrotrophic microorganisms also contribute to elevated ADVs in pasteurized milk.

The author is an Associate Professor in the Department of Food Science, Cornell University.

* Normal ADV - 0.4 to 0.8
Rancid flavor to most people--1.5 and above

TABLE 1

AVERAGE ACID DEGREE VALUES OF MILK SAMPLES

Year	Collected at Farm	Collected at Transfer Station	Milk Pasteurized Milk	Shelf-Life Samples
1975	0.71	0.83	0.9	-
1976	0.87	0.93	1.03	1.5
1977	0.95	-	1.1	1.7
1978	0.90	-	1.1	1.6
1979	-	-	.9	1.8
1980	0.95	-	.95	1.7
1981	0.92	-	1.16	1.7

The major off-flavors affecting consumer acceptance are "lacks freshness", "psychrotrophic" (bacterial) and "rancid". Samples from 96 milk processing plants were examined for total bacteria, coliforms, and psychrotrophs, as well as flavor and acid degree value within 36 hours of pasteurization, and again at the "sell-by" date. Nearly 90% of the samples scored good-to-excellent (8-10) when fresh. When rechecked at the end of the shelf-life period, over 42% of the samples were rated poor (5.5-0) (Tables 2 and 3).

TABLE 2

FLAVOR EVALUATION - NEW YORK STATE PLANTS - May 1978-Dec. 1981

Flavor Criticism	Samples From Plant		Samples From Store		Samples at Sell-by Date	
	No.	%	No.	%	No.	%
Good	322	53.1	56	42.7	14	2.0
Cooked	104	16.6	13	9.9	10	1.4
Feed	83	13.3	12	9.2	3	.4
Lacks Freshness	65	10.4	31	23.7	274	37.9
Psychrotrophic	1	.2	3	2.2	228	31.5
Rancid	16	2.6	15	11.5	185	25.6
Oxidized	24	3.8	1	.8	9	1.2
Totals	625	100.0	131	100.0	723	100.0

TABLE 3

FLAVOR CLASSIFICATION OF FLUID PLANT SAMPLES - May 1978-Dec. 1981

Flavor Score	Samples From Plant		Samples From Store		Samples at Sell-by Date	
	No.	%	No.	%	No.	%
Good to Excellent (8-10)	551	88.2	95	72.5	89	12.3
Fair (6-7)	55	8.8	18	13.7	324	44.8
Poor (less than 6)	19	3.0	18	13.7	310	42.9
Totals	625	100.0	131	100.0	723	100.0

Fresh pasteurized milk in New York State had an average acid degree value of 0.99. This increased to 1.7 when stored at a constant 44°F (6.7°C) until the product "sell-by" date--an average of 10.7 days during 1981 (Table 4).

Bacteria counts were generally less than 1,000 (SPC) when fresh and averaged 19,000,000 at the "sell-by" date (Table 5). Psychrotrophic bacteria counts confirm that large numbers of psychrotrophs are present in aged samples, even though the counts were low in freshly packaged milk. Samples with coliform bacteria consistently spoiled faster than coliform free samples (Figure 1).

TABLE 4

ACID DEGREE VALUES OF FLUID MILK SAMPLES - May 1978-Dec. 1981

ADV Range	Samples From Plant		Samples From Store		Samples at Sell-by Date	
	No.	%	No.	%	No.	%
≤ 1.0	348	69.5	48	53.6	48	7.5
> 1.0 ≤ 1.4	136	27.1	51	46.4	167	26.0
> 1.4	17	3.4	11	10.0	426	66.5
Totals	501	100.0	110	100.0	641	100.0
Range	.54-1.50		.64-2.20		.60-4.80	
Average	.99		1.10		1.70	

TABLE 5

STANDARD PLATE COUNTS ON PASTEURIZED MILK FROM PROCESSING PLANTS, RETAIL STORES AT SAMPLING DATE AND AGAIN AT SELL-BY DATE
May 1978-Dec. 1981

SPC/ml	Plant Samples			Store Samples			Sell-By Samples		
	No.	%	Avg.	No.	%	Avg.	No.	%	Avg.
Less than 20,000	620	99.2	840	125	88.0	1,600	115	14.6	7,300
More than 20,000	5	.8	27,000	17	12.0	180,000	671	85.4	19,000,000
Totals	625	100.0	-	142	100.0	-	786	100.0	-

Swabbing and line check sampling techniques were utilized to isolate sources of contamination. Examples of problems relating to age of sample (Figure 2), length of run (Figure 3), and location of contamination (Figure 4), pinpoint the problem.

Supermarket studies indicate poor rotation and stocking of display cases in many marketing areas. Of the stores surveyed, over 55% offered milk for sale which was over a week old. It was also found that milk in clear plastic containers had a significantly higher incidence of light induced off-flavor (oxidized) than the same brands in paper cartons.

Conclusions

For the most part, off-flavors are not caused by consumers, but are created during production and/or processing. These off-flavors are becoming more severe and are often caused by new methods of mechanical handling and the subsequent automatic cleaning. It appears that the present techniques of quality assurance are not sufficient to meet marketing demands. It is obvious that better sanitation and shorter "sell-by" dates are needed to maintain fresh taste--and that the current level of quality has a negative impact on milk consumption.

Figure 1

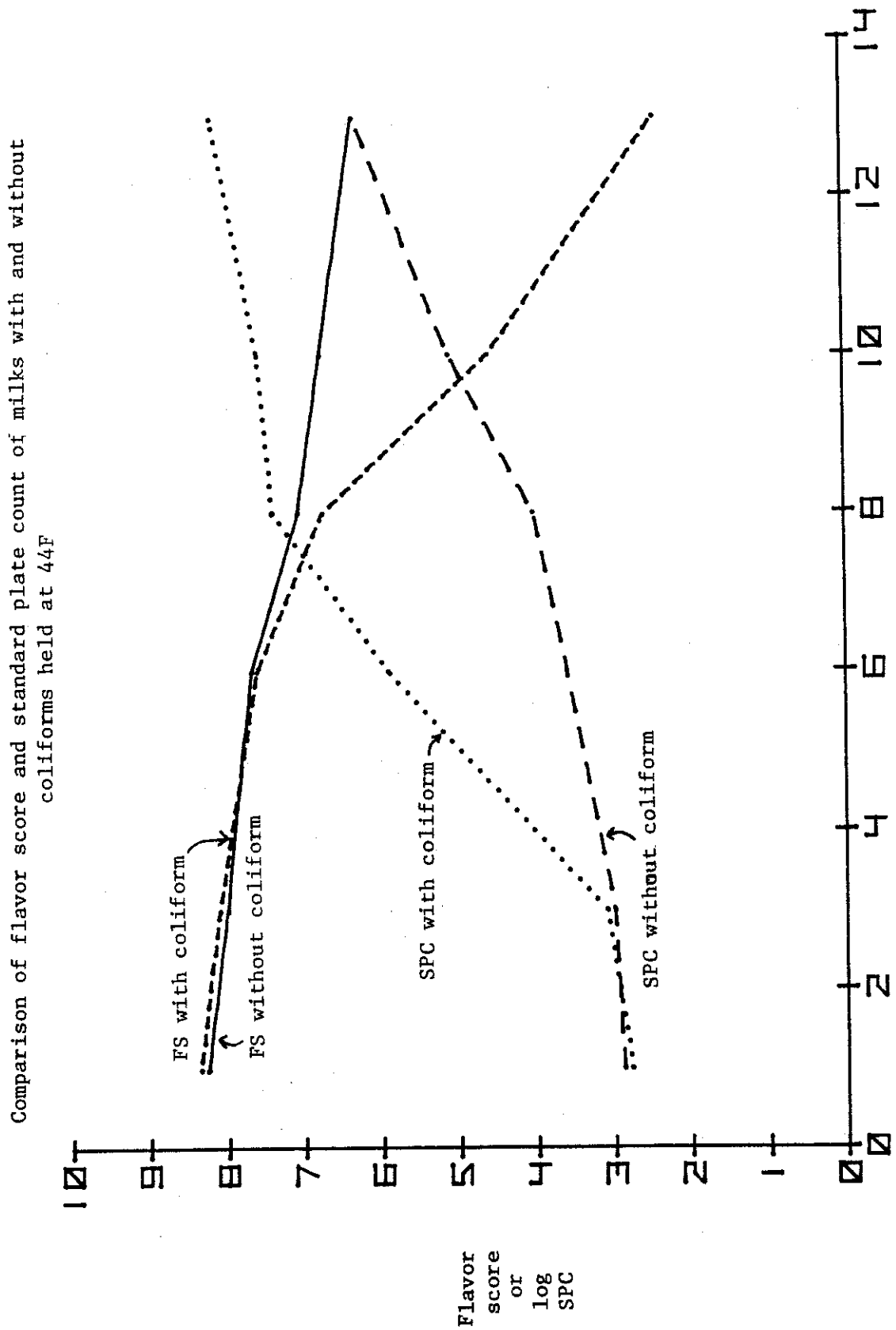

Comparison of flavor score and standard plate count of milks with and without coliforms held at 44F
FS with coliform
FS without coliform
SPC with coliform
SPC without coliform
Flavor score or log SPC
DAYS
0
1
2
3
4
5
6
7
8
9
10
0
2
4
6
8
10
12
14

Figure 2

MILK QUALITY PROGRAM

CORNELL UNIVERSITY -- DEPARTMENT OF FOOD SCIENCE -- 11 STOCKING HALL, ITHACA, NY 14853 -- PHONE: 607-256-3027

FIRM _____ CONTACT _____ PHONE _____

STREET _____ COLLECTED AT Plant ON 9/8/81 &

CITY _____ ZIP _____ PROCESSED ON _____ on 10/21/81

TEST DATE	LAB NO.	DAY	SAMPLE IDENTIFICATION	CODE	STANDARD PLATE COUNT	COLIFORM	RAPID PSYCHROTROPHIC COUNT
9/9/81	106	1	Homogenized - gal.	SEP 20	700	50	10
9/15/81		7			8,100,000	35,000	6,700,000
9/18/81		10			53,000,000	4,700,000	49,000,000
10/21/81	115	1	Homogenized - 1/2 gal.	NOV 02	11,000	< 1	-
10/27/81		7			10,000,000	90	-
10/30/81		10			180,000,000	3,600,000	-

Age of sample -- 1, 7, and 10 days

Figure 3
MILK QUALITY PROGRAM

CORNELL UNIVERSITY -- DEPARTMENT OF FOOD SCIENCE -- 11 STOCKING HALL, ITHACA, NY 14853 -- PHONE: 607-256-3027

FIRM _____ CONTACT _____ PHONE _____

STREET _____ COLLECTED AT Plant ON 10/21 & 10/22/81

CITY _____ ZIP _____ PROCESSED ON 10/21 & 10/22

TEST DATE	LAB NO.	DAY	SAMPLE IDENTIFICATION	CODE	STANDARD PLATE COUNT	COLIFORM
10/23/81	116	1	Homogenized - gal. plastic	OCT 30A	1,100	<1
10/29/81		7	Homogenized - gal. plastic	OCT 30A	41,000	<1
	117	1	Homogenized - gal. plastic	OCT 30A	1,100	<1
		7	Homogenized - gal. plastic	OCT 30A	240,000	<1
	118	1	Homogenized - gal. plastic	OCT 30B	3,200	<1
		7	Homogenized - gal. plastic	OCT 30B	12,000,000	15,000
	119	1	Homogenized - gal. plastic	OCT 30B	2,700	<1
		7	Homogenized - gal. plastic	OCT 30B	12,000,000	15,000
	120	1	Homogenized - gal. plastic	OCT 30C	4,000	<1
		7	Homogenized - gal. plastic	OCT 30C	13,000,000	15,000
	121	1	Homogenized - gal. plastic	OCT 30C	4,800	<1
		7	Homogenized - gal. plastic	OCT 30C	52,000,000	18,000

Length of Run -- Plant Operates 20 hours per day

Code A = First Shift
Code B = Second Shift
Code C = Third Shift

Figure 4
MILK QUALITY PROGRAM

CORNELL UNIVERSITY -- DEPARTMENT OF FOOD SCIENCE -- 11 STOCKING HALL, ITHACA, NY 14853 -- PHONE: 607-256-3027

FIRM _____ CONTACT _____ PHONE _____

STREET _____ COLLECTED AT Plant ON 5/28/82

CITY _____ ZIP _____ PROCESSED ON 5/28/82

TEST DATE	LAB NO.	DAY	SAMPLE IDENTIFICATION	CODE	STANDARD PLATE COUNT	COLIFORM	TIME
6/4/82	518	7	Homogenized - HTST	Line	3,000 est.	< 1	11am
	519		Homogenized - PMST #1	Line	4,000 est.	< 1	11am
	520		Homogenized - PMST #2	Line	3,000 est.	< 1	11am
	521		Homogenized - Valve Cluster to H-90	Line	3,000 est.	< 1	11am
	522		Homogenized - Valve Cluster, Gal.	Line	5,000 est.	< 1	11am
	523		Homogenized - Valve Cluster Q.80	Line	5,000 est.	< 1	11am
	524		Homogenized - Valve Cluster-Bag	Line	4,000 est.	< 1	11am
	525		Homogenized - 1/2 gal. paper	JUN 09	8,000 est.	< 1	11:15am
	526		Homogenized - gal. plastic	JUN 09	150,000	< 1	11:15am
	527		Homogenized - qt. paper	JUN 09	30,000,000	55,000	11:15am
	528		Homogenized - Bag in Box	JUN 09	10,000,000	10,000	11:15am
	529		Homogenized - 1/2 pt. paper NEP	B JUN 09	3,600,000	11,000	11:15am

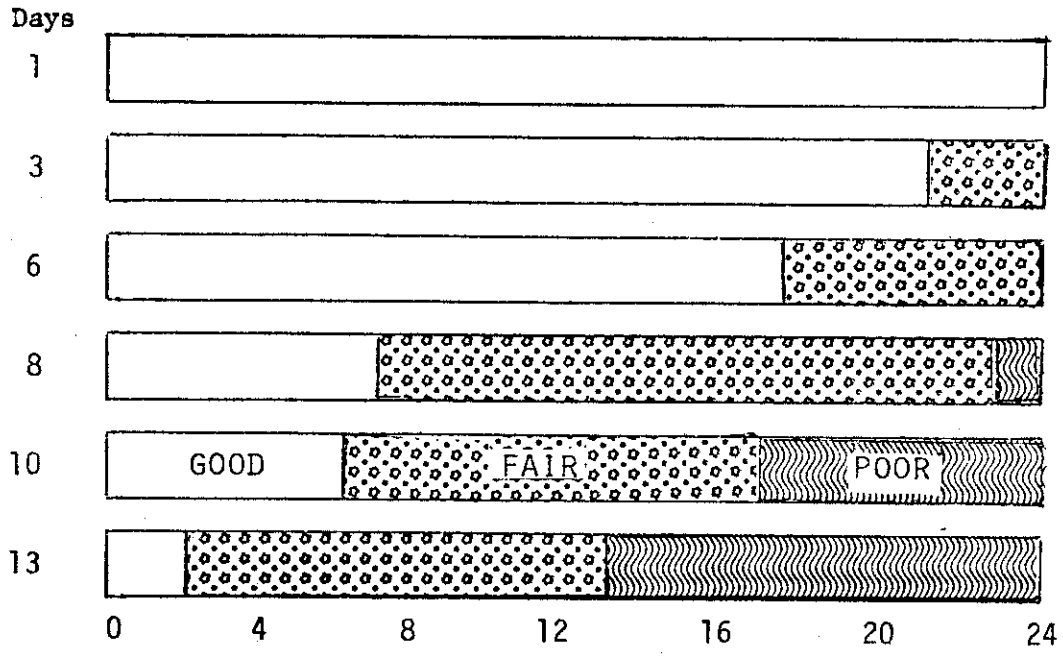
Line Samples -- Shows Contamination at Filler

IMPROVING THE QUALITY OF MILK

W. Frank Shipe

As Professor Bandler has pointed out, most of the off-flavors found in milk develop during storage. The magnitude of the aging effect is illustrated in Figure 1. These results were based on samples obtained from 24 of the largest New York State milk plants.

FIGURE 1. Effect of Age on Milk Quality



These samples were classified into three flavor categories, namely: good, fair and poor. It is worth noting that none of the samples were rated poor on days 1, 3 and 6, but by the 13th day 11 samples were classified as poor. A previous study indicated that samples classified as poor by the trained panel were considered unacceptable by a consumer panel. Obviously, milk, like all biological materials undergoes changes on aging. We cannot stop the biological clock, but we can slow it down. We can also speed it up, and unfortunately, we do sometimes. In order to improve milk quality, we need to know how to control this clock.

To aid in evaluating the rates of change in quality we decided to divide the samples into two groups based on their acceptability after 13 days of storage. As previously noted, there were 11 poor or unacceptable samples and 13 acceptable ones. The relative rates of flavor change for these two groups is shown in Figure 2. The rate of change for the acceptable group was relatively slow, whereas it was rapid for the unacceptable samples. Incidentally, a flavor

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The author is a Professor in the Department of Food Science, Cornell University.

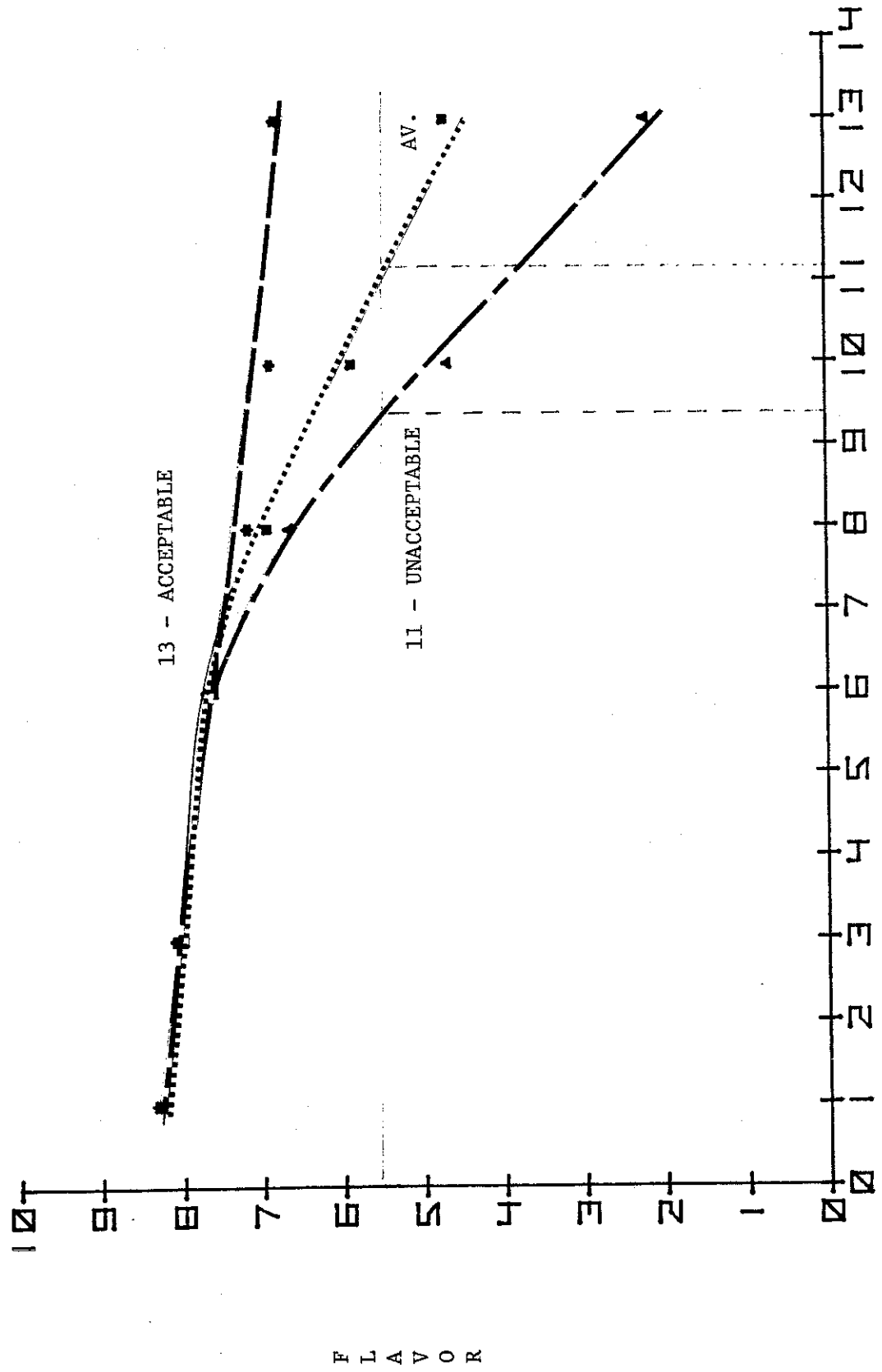
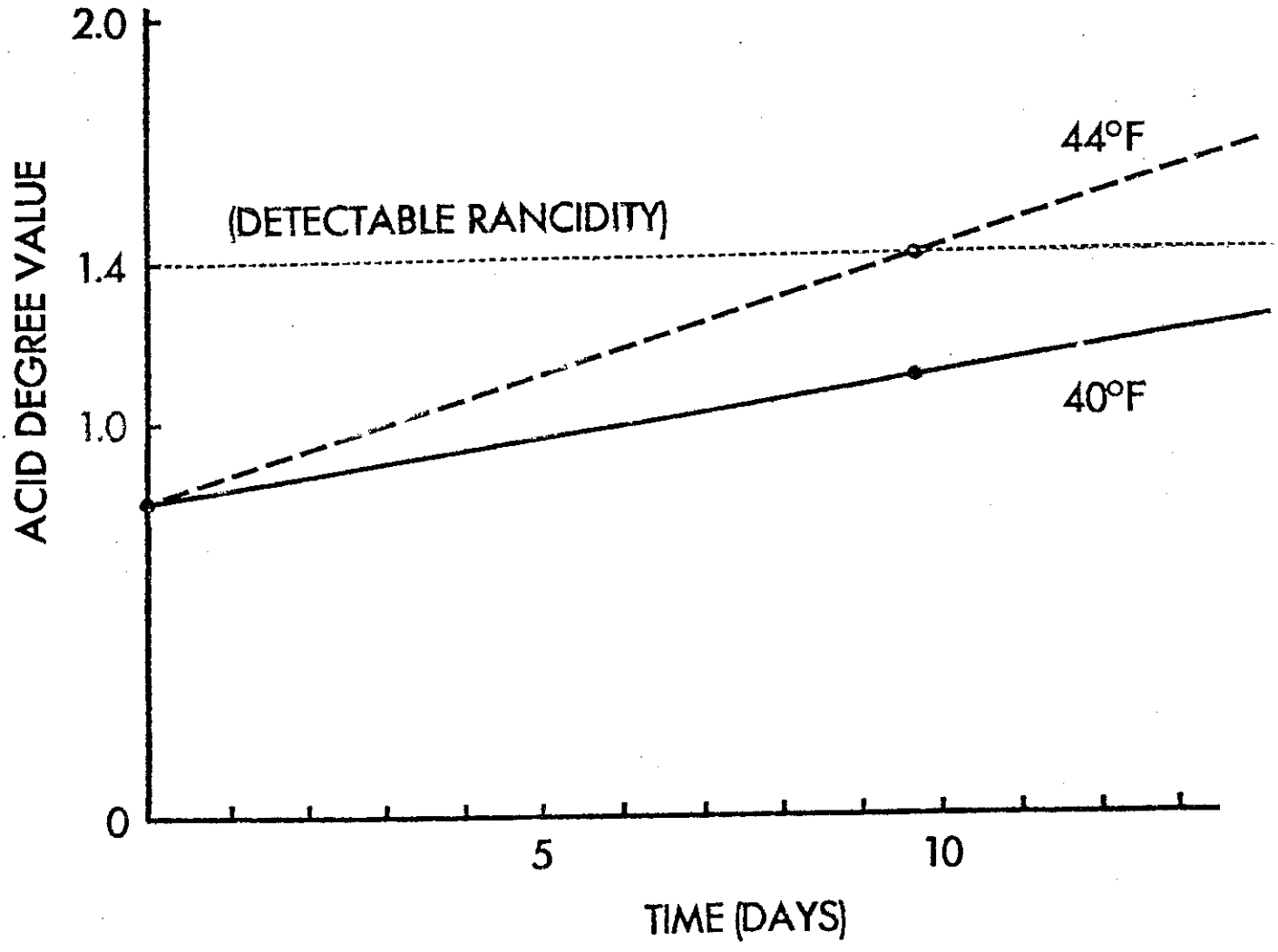


Figure 2. Comparison of the rates of change in quality of two groups of milk samples.

score of 5.5 was found to be the dividing line between acceptable and unacceptable samples. If we express shelf-life in terms of time it takes the samples to drop to a flavor score of 5.5., the unacceptable group had an average shelf-life of about 9½ days compared to just over 11 days for all samples. The extrapolated shelf-life for the acceptable samples would be about 24 days. A trained taste panel described the off-flavors in the 11 unacceptable samples as fruity and fermented, or rancid or oxidized. Other studies at Cornell and other universities have confirmed that these are the predominate off-flavors in unacceptable milks. Therefore, slowing down the development of these off-flavors did contribute a great deal to prolonging the shelf-life of the milk from the 13 "good" plants.

The development of either fruity-fermented or rancid flavors can be reduced significantly by lowering the storage temperature. For example, the rate of development of rancidity was markedly reduced by lowering the storage temperature from 44 to 40°F (Figure 3). The results are expressed in terms of acid degree values. When the acid degree value exceeds 1.4, the rancidity becomes detectable. As may be seen, milk stored at 44°F reached this critical value at 10 days, whereas it would have taken 18 days to reach this value if the storage temperature had been 40°F.

FIGURE 3. Effect of Storage Temperature on Development of Rancidity.



As is shown in Figure 4, processing temperature can also affect the development of rancidity. For example, increasing the processing temperature from 162 to 170°F increased the time it took to reach the critical 1.4 acid degree value from 4 to 13 days. Of course, the time it takes to reach this value also depends on the initial value. Milk that has been properly handled before pasteurization should have an acid degree value of 0.8 or lower. Any mechanical abuse of raw milk such as excessive agitation or pumping will increase the acid degree value.

Lowering storage temperatures and increasing pasteurization temperature also reduces bacterial growth which cause such flavors as fruity, fermented and unclean. Of course, these off-flavors could be avoided if it were practical to completely eliminate bacterial contamination. Thorough cleaning of equipment and utensils does eliminate most, but not all contamination. Some equipment currently in use is difficult to clean and/or does not provide much protection against environment. For example, our results indicate that milk packaging equipment is a primary source of post-pasteurization contamination of milk. Some of this equipment is difficult to clean, but this task is not insurmountable. Some of the newer equipment is easier to clean and also is protected against air or water-borne contamination.

Studies at Cornell and elsewhere have revealed considerable variations in the amount of bacteria in the air in milk plants. Contamination from the air can be avoided by air filtration. In the next month, we will be installing a new packaging machine manufactured by Ex-Cell-O Corporation. This equipment will allow us to filter the air and/or operate the equipment in a controlled atmosphere. For example, we will be able to replace some of the oxygen surrounding the packaging unit with nitrogen or carbon dioxide. Laboratory tests indicate that this will enable us to reduce bacterial contamination. This new equipment is also designed to protect the packaging unit from contamination with water condensate. Research will be conducted to determine the effectiveness of these new features in reducing the development of off-flavors.

As mentioned earlier, some of the unacceptable samples had oxidized flavor. The observed oxidized flavor was of the type produced by the exposure of milk to light. Homogenized milk is particularly susceptible to this type of oxidation. (Oxidized flavor can also be caused by metallic-induced oxidation. However, this type of oxidized flavor has practically disappeared from the present U.S. homogenized milk supply.) The incidence of light-induced oxidized flavor is increasing because of longer storage and increased exposure to light.

The exposure of milk to light is of special concern because it affects nutritive value as well as flavor. The rate of flavor and nutrient degradation depends on the intensity and wavelength of light. Fluorescent lights do more damage than incandescent lights. Both riboflavin and vitamin A are sensitive to light. Added vitamin A is particularly sensitive to light as is shown in Table 1 The rate of loss is greater in low-fat milks because they are more transparent and the added vitamin is more exposed.

TABLE 1. Effect of Fat Content on Loss of Added Vitamin A in Milk.

Time	Type of Milk			
(hrs)	Whole (3.4%)	2% Fat	1% Fat	Skim
2	18	26	28	31
4	37	44	49	57

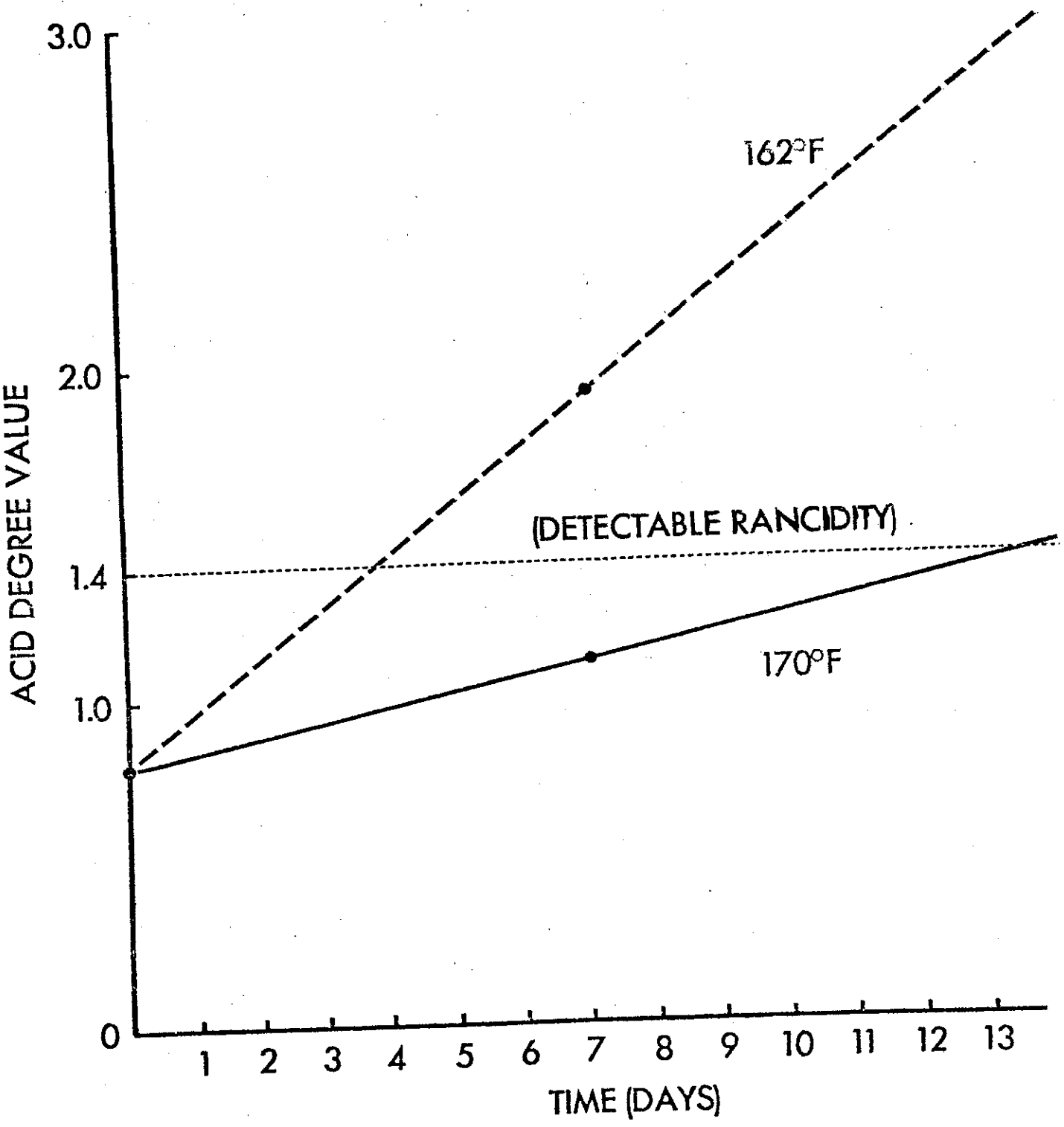


Figure 4. Effect of pasteurization temperature on development of rancidity.

The rate of loss is also dependent on the transparency of the container (Table 2). The fiberboard or cardboard container is the least transparent, whereas the PE nonreturnable container is the most transparent.

TABLE 2. Effect of Type of Container on Nutrient Loss in Skimmilk Exposed 24 hr to Fluorescent Light (200 foot/candles).

Containers	Vitamin A	Riboflavins
Fiberboard	15%	2%
"Vitagold"*	33	1
Glass	80	9
Polycarbonate	87	16
PE (returnable)	79	15
PE (throw-away)	90	14

* Polycarbonate container which has a gold tint to partially block the light.

The transparency of plastic containers can be reduced by the addition of compounds such as titanium dioxide (TiO_2). The protective effect of this compound is shown in Table 3. Although 10% TiO_2 gives very good protection it makes the container more brittle and expensive. Pigments can also be added to plastic containers (e.g. the "Vita Gold") to provide protection. We are currently testing the protective effects of various combinations of pigments with titanium oxides.

TABLE 3. Losses of Riboflavin in Whole Milk After 24 and 48 Hours Exposure to Fluorescent Light (200 foot-candles) in Containers With and Without Titanium Dioxide (TiO_2).

		% Riboflavin Loss with Exposure of:	
Sample	TiO_2 Conc. (%)	24 hrs.	48 hrs.
Unexposed control	--	0	0
PE	0	6.1	15.2
PE	1	4.9	11.7
PE	5	2.3	5.8
PE	10	1.4	2.0

The results of the taste test that you just completed demonstrates the effect of flavor on consumer preference. We gave you a good, fair and poor example. Of the 67 people ranking these samples, the majority of you preferred the good sample, only one person put it in third place. The fair sample, which had a slight rancid flavor, was placed second by the majority. The poor sample, which had a strong light-induced oxidized flavor was rated last by 82% of you. Only 5% of you gave it first place. Incidentally, this sample, which came in a one-gallon clear plastic jug, was picked up yesterday in one of the local grocery stores. Certainly samples like this will not help to increase milk consumption.

In an address on consumer attitudes towards processed foods in the 1980's, Anne J. Nielson of Arthur D. Little, Inc. indicated that consumers will be less capricious and inconsistent and somewhat more predictable. She suggested that they are becoming more quality conscious. Therefore, to be successful, processors would have to provide extra value such as sensory satisfaction, nutritive benefit, convenience, or added shelf-life. The dairy industry can provide all of these.

Unquestionably, milk is the most nutritious beverage on the market. Unfortunately, it is also the most perishable beverage. Therefore, we have to work harder than our competitors to preserve the excellent qualities of properly handled fresh milk. So let us beat the competition by maintaining the superiority of high quality milk. To accomplish this, we need to keep it clean, cool and in the dark - but we must not keep it too long.

THE TECHNICAL FEASIBILITY OF DEVELOPING NEW DAIRY PRODUCTS

Robert R. Zall

Introduction

The most serious drawback we have in achieving a more meaningful measure of technical growth for developing new dairy products will probably be overcome when we stop using petty legislation to protect so-called traditional products against competition. The dairy industry needs to produce and market a wide range of products, some of which may not be derived entirely from milk. My view substantially agrees with some of the thoughts expressed by others at an earlier symposium on "Milk Products of the Future"* held in the U.K in 1974. Then as now, researchers met with members of the dairy industry and others to discuss how to improve the utility and marketability of milk and milk products.

Technical Capabilities

Some of the tricks we can use to develop new dairy products are already in hand and just a sampling of these might be as follows:

-- Heating - using ultra-high heat or to process milk products in pouch containers

-- Electrodialysis - to modify salts

-- Gel filtration - to fractionate

-- Ultrafiltration - to fractionate

-- Reverse osmosis - to concentrate

-- Resin bed hydrolysis - to cause a conversion of lactose into glucose and galactose

Now as never before, it's possible to separate, concentrate or even fractionate milk into an almost endless number of chemical constituents. Most changes need little or no heat so delicate substances like proteins, for example, can be rearranged into all sorts of structures which can be used to improve the functional or nutritional qualities of dairy products.

Some of the tools at our disposal can be described as follows: Traditional heating has moved into a new area when combined with ultra-high heat and pouch retorting methods. What this means is that we can heat hotter and quicker to

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* Proceedings of the Symposium on Milk Products of the Future, Society of Dairy Technology, United Kingdom, 1974.

reach thermal stability with minimum product degradation. In general, we're better off but heat stable proteases continue to be troublesome and long shelf-life products still face defects caused by chemical spoilage.

Electrodialysis can be used to modify wheys, demineralize ultrafiltrates and, in general, be used as a selective technique to remove different salt ions in milk and milk fractions.

Gel filtration is best characterized as being a process which is the reverse of filtration. In filtration, the medium is built to retain larger particles or molecules but in gel filtration, the small molecules are retained while the larger ones pass through void spaces in a packed bed. Proteins, for example, will be eluted from a bed while salts and lactose are retained. Sephadex is perhaps the most commonly used bed packing material. At this time, many different bead-like materials can and are being suggested.

UF and RO systems are essentially similar in principles of operation. Both use supported semi-permeable membrane films and use pressure (and/or velocity) to force water and molecules smaller than membrane pores through the membrane. Operationally, RO and UF are simple processes; the major differences between them is membrane pore size and pressure required to drive molecules through the pores (an oversimplified explanation of the concept). The feed solution under pressure flows over a supported membrane. Most water and product molecules, smaller than membrane pores, pass through the membrane and its porous support. The filtrate which is called permeate or ultrafiltrate can be collected. Retentate or concentrate consisting of larger molecules can be recirculated back through the membrane plant many times so as to concentrate liquid material by removing smaller molecules such as milk sugar, salts and water from circulating systems. The driving force used to concentrate milk in a membrane system is a pump, and moisture separation from solids takes place at a temperature of about 40°C (120°F).

What this means to the food processor is that it is possible to concentrate milk solids without injuring heat sensitive components which denature partially when milk is condensed or dried by the more conventional dehydration schemes. Undenatured proteins can react with other components in food systems and provide different characteristics to the structure and physiochemical properties of foodstuff.

Ion exchange is not a new breakthrough to us as most of us know of its use in water softening work. However, special ion exchange resins or similar material are put together with greater affinity for selecting positive or negative ions to alter milk products sent across or through ion exchange resin beds. Ion exchange equipment is used together with resin bed operations containing bound enzymes to hydrolyze lactose to glucose and galactose. The popular press and trade journals, of late, have been reporting of the Corning Glass - British/French connections. My own colleague, Professor W. Frank Shipe, was a very early worker in this whole area and deserves much of the credit for using bound enzymes to hydrolyze lactose.

Developing New Products

According to a February 1983 article on the food industry outlook in "Food Processing", a Putnum Publication, the dairy products sector is said to be made

up of five industries which are: 1) fluid milk, 2) cheese, 3) condensed and evaporated milk (I suspect powder), 4) ice cream and frozen desserts, and 5) butter. We can expect an overall increase in production within these areas of about 0.1% from 1982 to 1987. The article goes on to state that innovative technology and product development may change the dairy industry's prospects by the mid-80s. Aseptic packaging, UF and whey permeate conversion may help invigorate the dairy sector enough to put more products into day-to-day use. I tend to agree with crystal ball statements and have even suggested that RO permeate which is almost pure water is valuable too and we can even look to utilizing the aqueous phase from milk as a toxic free liquid because it has been passed through a living filter; in this case, the cow. Imagine selling billions of pounds of water now being wasted for which the industry pays about thirteen dollars a hundredweight.

Where Are We?

Here we sit, for the most part, a fairly efficient dairy industry with operating food plants, on-going distribution systems, access to almost every major food store in the world and just waiting for some outsider to literally take away more of the industry business. We are told that in 1982, it has been estimated that so-called imitation dairy products had already captured about 70% of the butter market, 50% of the cream market, 15% of the flavored milk market, 5% of the cheese market, and about 2% of the ice cream market.

Technical Abilities

Even though we have the technical ability to produce and market superior dairy products, we hesitate. Take, for example, butter blend products; we failed to exploit the market. It seems as if we really had to wait until the Swedes and the British showed us on their side of the pond that butter blends increased the overall consumption of butter. In fact, from data I studied, the information showed that it was margarine products that lost ground when consumers were offered a smooth, easy-to-spread, tasty butter enriched vegetable fat product.

We are seeing situations where technical innovations create new food ingredients and factories are actually built to make product but, unfortunately, without sufficient effort applied towards developing uses for the new product. Poorly thought out strategy such as making a commodity but not knowing what to do with it hinders efforts to take advantage of the new technical breakthrough. A case in point appears to be that of whey protein concentrates (WPC).

"At this time, only approximately 8% of the whey solids processed in the United States is fractionated by ultrafiltration as WPC. The current market for WPC is still unfamiliar and immature and ample room exists in the marketplace to product more WPC providing producer and end users learn how best to market WPC products".*

European milk product companies are dealing with WPC and other new kinds of product and appear to be more advanced technically than most of the dairy firms doing business in the U.S. at this time. In fact, British and Dutch firms are

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* From Whey Protein Concentrate Market Enhancement, NYS ERDA Report 82-89, prepared by R.R. Zall.

buying into the American industry because they seem to see opportunities for growth. Substantial sums of funds of European dairy firms annually go into research and development projects and, from where I sit, they are not afraid to put their money where their mouth is.

The only restriction we seem to have with our technical feasibility to develop new dairy products is the inability of senior executives to be willing to venture very far from uncharted courses. We're short on imagination and long in regulation. Most people seem to have lost the enthusiasm to move ahead into a revolution of technology that threatens basic dairy traditions. What we need to do more often State side might be to use knockdown brainstorm sessions much like the one I was invited to attend in Ireland just a couple of years ago. A major milk company doing business in the U.K. brought together a dozen or more scientists from Europe's universities and research stations. We were wisked from Cork Airport via helicopter to a remote hotel in Parknasilla, Ireland and kept isolated for three days. Our task was to look at milk as a biochemical refinery with no holds barred. Topics ranged from "Enzymes and their activity in biological membranes" to "Industrial prospects for genetically engineered microorganisms".

What were the tangible results from this meeting? For one, this company invaded the States via Vermont, has spread to the West coast and infiltrated the South. In my opinion, they will demonstrate outstanding technical ability to develop new dairy products and with good luck, some firms may be able to copy the better ideas. While for some it may be the best they do in life is to be a follower, for myself it's invigorating to lead, even if only occasionally.

THE ECONOMIC FEASIBILITY OF DEVELOPING NEW DAIRY PRODUCTS

Albert J. Ortego, Jr.

I am not sure why I have been asked to talk about the economic feasibility of developing new dairy products. As far as Dairymen is concerned, we have limited experience in new product development. For those of you who are not familiar with Dairymen, let me describe it briefly. Dairymen is a dairy farmer cooperative with about 8,000 members in 17 states. Dairymen operates 22 milk processing plants, 7 manufacturing facilities, and one UHT milk plant. Dairymen has made one significant attempt at new products--the introduction of UHT milk to the U.S. market. Maybe this recent experience and our newness to the field caused the program planners to feel that we could relate our experiences.

When considering the economic feasibility of development and introduction of new products, there are two things that hit you: 1) the numbers introduced, and 2) the successes obtained. For example, in 1982, 1,510 new products were introduced in the food, health, and beauty area. This is the highest number in 19 years, despite a recession. The projection is that the number introduced will increase in the future, because more are being developed as technological improvements create more ways to make new products. Unfortunately, the percentage of new products that succeed is low. Between 1970 and 1979, approximately 6,700 new food products were introduced. Of these 6,700, only 93 achieved sales of $15 million or more annually. This indicates that the introduction of new products is a <u>risky venture</u>.

Given such high risks, pre-introductory research and experience (knowledge of what you're doing) is extremely important. New product introduction is risky and costly from the broad perspective of all products, and it certainly applies to dairy products. However, as you have heard earlier today, the dairy market trends strongly support the need for new product development. The decline in per capita consumption of fluid products has been influenced by the extensive non-milk beverage advertising and the changing population makeup. Consumption of fluid milk products in the future will have to contend with these.

A number of studies show that new product successes must appeal to consumers' needs--either real or perceived, their desires, or their life styles. Recent research shows that today, successes are higher when the new product appeals to at least one of the following criteria:

1. The consumers feel the product is "good for me"; today, nutrition, good health and diet are "in".

2. The item offers convenience. It fits in with a pastime, hobby or life style.

3. It's natural and can be promoted as being natural. People are turned-off by additives, preservatives or imitations.

4. The quality of the product, whether real or perceived. Today consumers want premium quality--not just a low price.

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New product introduction must first meet consumers' needs and desires--not only today, but also the trends into the future. Does the product fulfill the needs of a group of consumers large enough to warrant its production, sale and distribution? Will there be a large enough market from the group of consumers who are willing to buy? The projected changes in population characteristics of the group: the age, the family size, the lifestyle, disposable incomes, etc., must be considered. The degree of penetration of the product and your market share must be evaluated.

Secondly, the product must fit relative to the other corporate operations. In other words, if the new product fits in the product line you're already marketing, chances for success are better. Questions to be raised are: Will it help the company's marketing and distribution setup; that is, contribute to what the company already has? Will it fit in with the corporate philosophy? In the case of Dairymen, will it sell more members' milk in Class I? Will prior experience help the new product's success? Can the experience of the company help the product succeed? There is an old adage, "You do a better job in dealing with things with which you are familiar."

Thirdly, will the product fit into the current production capabilities of the company? Does it fill a specific need of the company in terms of utilizing certain of its raw resources, its capacity, its labor, or any resource that may be under-utilized?

When introducing a new product, the company must evaluate the ease of entry by potential competitors. What is the probable competition and how soon will it come about?

Another factor to consider is the extent of government regulation to be dealt with. I was surprised at Dr. Zall's comments on this. I agree strongly with him that this is a factor restraining the development and the introduction of a new milk product into a market. I'll return to the subject of regulations later.

Why did Dairymen introduce UHT milk to the U.S. market? Everybody looked at it; it's been in Europe for a long time. Other traditional dairy processing firms rejected introducing the product. Why then did Dairymen decide to go into it when everybody else turned it down?

Dairymen is a cooperative organization. It's member producers have primarily one product to sell--milk. They saw a possibility to expand the sale of their milk. It offered an opportunity to recapture, at least partially, the market that had been lost to other beverages. Secondly, it is perceived as a product whose time has come. For the total processing, storage, and distribution functions it saves energy. It meets the needs of a segment of the consumer market.

Being first in the market has some advantages. If the product is to succeed, being first allows you to develop a brand that becomes associated with the product. Evaporated milk is generally referred to as PET milk. Being first allows better control of marketing strategies for the introduction, development and pricing of the product. Some additional gains arise from being the only supplier.

Introducing UHT milk into the U.S. market was not free of problems. There were no approved plants in the United States from which we could produce the product for market testing. We had to make decisions on less market information than was needed. We had to build a plant before we could test market the product. Limited consumer tests were made with product processed by North Carolina State University. That plant was not licensed for interstate commerce. So we decided to build a highly specialized plant without knowing if the product would succeed in the commercial market. Our member farmers took a lot of risk.

On what did we base our decision? We made consumer surveys. We used focus groups on the UHT concept, on the package, and on the products' taste. In-home tests were run in Florida with the cooperation of that State. Florida allowed us to place milk, without charge, in selected homes to have people use it. Here we tried to determine acceptance, uses, and consumption by age of person consuming the product.

We surveyed potential customers at retail and in the food service industry. Potential customers provided information as to how the product might fit into their operations, and how it would be best handled and merchandised.

Based on this initial research the decision to go ahead was made. Initial roll-out, target audiences, the positioning of the product, and the media commercials were developed on this limited information. After initial roll-out, commercial test marketing began and is still going on.

There are some regulatory restraints on the introduction of new dairy products. Regulatory agencies involved and required actions included: Food and Drug - process approval by the Low Acid Canned Foods Division; U.S. Public Health Service - amending the PMO; the State Health Departments - approval of the revised PMO and obtaining permits from each; USDA - changing Federal Marketing Orders; State Milk Commissioners - getting licenses; other - approval of labels, export approvals, etc. Container size requirements kept us from going to the metric system. Getting equipment for quart and half-pint packages was easier than tackling those regulations. Regulations to be met just to introduce one product are numerous!

These are examples of the perils of pioneering, or put another way, pioneering is painful. Those who enter the market after us will not have to go through a lot of this. The point is, that in our opinion, the extensive regulations that must be met are deterrents to the development of new dairy products.

We began marketing this new product and test marketing it simultaneously. We employed Adtel Test Marketing Group, Inc. to test market the product. We used Orlando, Florida and Evansville, Indiana because both of these had split cable television capabilities and supermarkets with scanner checkouts. With the scanner, the name, volume purchased, and the price of each product is recorded and printed. This allows data to be compiled on an individual family basis. In these markets, Adtel has established a representative group of consumers. Selected families have a card that is passed over the scanner and that specific data is kept in the computer. All demographic and economic data on each of these consumers is also in the computer. For a fee, Adtel provides its client with data for six months prior to the research and during the research period. You can then evaluate whether the product replaced other milk, other beverages, or was added sales. Advertising can be tested through split cable television. Certain messages can be aired only to certain homes. One message can be limited to certain homes while another message can be sent to other homes. The level of advertising intensity can similarly be tested.

We have learned that we have two products: 1) FARM BEST white milk and 2) SIP UPS flavored milk. Five flavors are being sold: banana, fruit punch, vanilla, strawberry, and chocolate. The flavored milk drinks don't compete closely with the regular milk and the white milks do not effectively compete with beverages. We have targeted our products that way. We're going after a segment of the market to meet special needs and desires of consumers. The product is not going to take over the bulk of the regular fluid milk market. Our objectives are to expand the total market for white milk and to recapture part of the market by making flavored milk an exciting drink that competes well with beverages.

We have made a concerted effort and commitment to these products. The risk was and still is high. The investment is substantial. It is a costly project to the members of Dairymen, Inc. The Board of Directors is being very foresighted because it will be some time before we penetrate the market sufficiently to make the plant a profitable operation. The payoff is to be long term. We are more optimistic today than when we decided to build a plant. We know that we have a big job ahead but we believe that the convenience, the special uses, and the beverage character will make it a successful product.

Traditional fluid milk products will continue to decline on a per capita basis. Our population is getting older; there are fewer children; more one and two person households; and, life styles have been and are changing. These changes do not support higher per capita consumption. It is our opinion that the bulk of our market will continue to be the regular fluid milk products. We need, however, to develop special products for different segments of the market. New products that will satisfy specific needs of specific groups can expand our total market for milk and dairy products.

Raw milk is a basic raw material to be combined with something else, separated into its components, modified or recombined with any other product or in any fashion that will result in a product that can be sold to expand the total market for milk.

GROWTH IN THE FOODSERVICE SECTOR: WILL DAIRY PRODUCTS BENEFIT?

Nancy Kruse

Foodservice industry sales currently approach $140 billion annually. Today, away-from-home food consumption accounts for one of every five meals eaten in the U.S. and $1 out of every $3 spent by consumers on food. Foodservice represents a staggering 187 million individual transactions each day. In short, the foodservice industry is huge; it deserves our best promotional efforts.

Let's look at the overall foodservice industry in some detail before we focus on dairy products' role in the industry. Foodservice is the nation's largest retail employer. As a leading economic indicator, foodservice outperforms two of our major growth and glamour industries--electronics and aerospace. Foodservice's sales growth over the last five years has been exceeded only by the computer and oil and gas industries. Of the over half-a-million foodservice establishments nationwide, three-quarters are commercial, while the remaining quarter are non-commercial--mainly schools. There are twice as many foodservice as retail grocery outlets.

Marketing to the foodservice trade differs in key ways from marketing to the retail grocery trade. The foodservice marketing environment is unique in at least six ways.

1. Foodservice marketing is commodity or generic marketing, rather than brand-oriented marketing. Brand identity is lost as recipe ingredients are combined out of the view of the final consumer.

2. Foodservice marketing is "push", not "pull" oriented. In this industry, outlets must be "pushed" into using the foodservice manufacturer's product, in contrast to retail marketing where advertising can convince the final consumer to buy ("pull") it, dictating the products the retailer stocks. This distinction means that foodservice marketing is sales, not media, intensive. It also means it's indirect marketing and establishes promotion as a key ingredient in the sales strategy.

3. The foodservice industry is involved in mass feeding, not individual (or family) consumption. Foodservice products must lend themselves to batch-preparation, often by unskilled labor under widely differing conditions.

4. Foodservice operators' purchase criteria are different than those of individual consumers. To the foodservice operator, cost per serving, yield, nutritional content, and technical product characteristics are of prime importance.

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5. Foodservice marketers have very few marketing management tools available to them. Market share data, industry trends, and statistics on the nature of competition are scarce. Intuition and personal selling skills are vital to the foodservice manufacturer's marketing success.

6. The distribution function in foodservice is unique too. The distributor salesman is usually the manufacturer's only link to the foodservice outlet and each product is but one of thousands the distributor handles.

Within the foodservice industry there are major differences in how business is done. This presents another set of challenges to the foodservice marketer. To some foodservice outlets such as schools and hospitals, nutrition is a key product concern while to other segments, the profit margin a product offers is its most important attribute. Bulk packaging is required to satisfy some foodservice outlets but others demand portion control. In the non-commercial segments of the market, selling is by bid system but in the commercial segment the open selling system predominates. Finally, foodservice manufacturers must cope with a different kind of consumer in the away-from-home market. Having chosen to eat away-from-home, the consumer expects a "psychological reward", something different. The consumer is giving himself/herself a special treat and quality may take on new importance in this environment.

In the face of this myriad of challenges, many manufacturers and industries have been slow to exploit foodservice opportunities. The dairy industry is no exception. While the following figures might sound impressive, many foodservice opportunities remain for our industry to exploit. Thirty-three percent of total U.S. milk utilization is in foodservice. Sixteen percent of fluid milk is consumed in foodservice outlets--but 10% of that volume goes into schools. Only 6% of milk consumption occurs in the remainder of the industry. More than half of all butter sales occur in foodservice for application, both in the kitchen and on the table. Cheese has shown the best overall dairy product growth in foodservice; more than 30 percent of all cheese is consumed away-from-home. Surprisingly, only 20 percent of ice cream sales are made in foodservice establishments--a clear example of under-promotion.

The dairy industry has some advantages it should capitalize on in the foodservice market. Dairy products are the second most purchased commodity in foodservice, behind the meat/poultry group, but more can be done. Dairy products enjoy almost universal distribution, a situation many other commodities can only dream of enjoying. Dairy products are merchandisable in both the dining room and the kitchen. And consumers exhibit a preference for our industry's high quality, nutritious, good-tasting products.

Dairy products' opportunities in foodservice are enhanced by the growth in away-from-home breakfast consumption, offering potential to increase milk and butter usage. The vigor of the ethnic restaurants in the U.S. market (especially Mexican and Italian food) means increased cheese sales. Only the popularity of Oriental cuisine presents no viable dairy product opportunity. Dairy products' image also helps position them well to address the major trend in the industry today: lighter and healthier eating.

Dairy product manufacturers must meet several challenges in order to increase their foodservice sales. One of these is in the beverage category where atypically for foodservice, brand preferences have been successfully

established--principally for soft drinks. The beverage category is especially promotion-sensitive and new product introductions help register gains for competing beverages. Perhaps our biggest challenge is from imitations, however. Estimates place our losses to imitations at 6 percent in the cheese market (35 percent for mozzarella, mostly in foodservice). Butter "blends" threaten tabletop use in foodservice, the remaining stronghold of domestic butter sales. Perhaps as much as 80 percent of the sour cream foodservice market has been lost to imitations. This latter development is particularly unfortunate since the popularity of Mexican food has made the sour cream market a fast-growing one. Since there is no federal or state ingredient labelling requirement for foodservice, the substitution of an imitation in a recipe is simple for eating establishments. Why have imitations been so popular in foodservice? Primarily because they sell for 30-60 percent under the cost of real dairy products. In a minority of cases the technical/nutritional qualities of imitations have endeared them to foodservice operators.

What can we do to turn this situation around and capitalize on this fast-growing, profitable market for dairy products? We need three things to get the job done.

1. We need commitment from all segments of our industry. Foodservice experts, not retail specialists, must be employed to sell in this market. Promotion dollars must be allocated to the foodservice segment commensurate with its size and potential.

2. We need more research, research on new products, packages, technical improvements to existing products, strategic product positioning, and basic market information and intelligence.

3. We need to communicate the advantages of real dairy products to foodservice operators. These advantages lie in the business benefits of using only real dairy products: their profit opportunity, their consistent quality assurance, and the satisfaction consumers derive from having been served real dairy products.

ADVERTISING DAIRY PRODUCTS FROM A MANUFACTURER'S POINT OF VIEW

James E. Tillison

Increasing Milk and Milk Product Consumption is truly an important issue facing the dairy industry in the 80's. April 1, Farmers face a $1 per hundredweight assessment because, in part, consumption has not kept pace with production. Regardless of what program is adopted to control supply, increasing the demand for milk products is a vital part of the long-term healthy solution to the current crisis.

I have been asked to give you the manufacturer's point of view on dairy products advertising. You know, a person's point of view, his perspective when looking at something depends on his situation and his experience. It's like the Wisconsin farm boy who was proudly showing his cousin from Texas how big his father's farm was. Upon finishing the tour, the Texas boy was obviously unimpressed. He said, "Shoot, my daddy can get in his pickup in the morning, drive all day, and never leave our spread." The Wisconsin boy, obviously peeved, thought for a moment and then responded, "Yeah, my dad had a truck like that once too."

Rather than cite numerous statistics and so forth, I would like to talk to you about dairy product manufacturers, the marketplace, dairy products promotion, and finally tie it all together to give you what I believe is their point of view.

Basically, manufacturers of dairy products can be categorized by the way they market and therefore manufacture their products. The first, and most common type, manufactures what I call bulk type products. In the case of cheese, this manufacturer markets the one or two types of cheese he produces to a processor-wholesaler like Sargento, Kraft, Borden, or Schreiber Foods. These processor-distributors in turn take his bulk product, process it further into processed cheese, or cut and package it for sale.

The bulk type manufacturer has no sales force since he usually deals directly with his one customer. Because of this marketing situation, the bulk manufacturer spends virtually nothing on advertising and promotion. A Purdue University study completed in 1980 "Cost and Financial Performance of Wisconsin Cheese Plants" found the typical plant spent about three-hundredths of one percent of gross sales on advertising. His profit margin is relatively small, but payment for products is fast and there is little credit risk. Obviously, their perspective on advertising is a reflection of their product marketing.

The second type of manufacturer makes what I will call consumer type products. This is a growing group in the cheese industry. He has decided to leave the relative security of 'one customer bulk sales' for the promised land

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The author is Executive Director, Wisconsin Cheese Makers Association, Madison, Wisconsin.

of increased profits through more direct marketing. The consumer in this case could be a retailer, a distributor, or a manufacturer of prepared foods such as pizzas. This type of manufacturer has invested in additional packaging equipment, a sales force (either in house or a paid broker) and spends considerably more on advertising than the bulk manufacturer. A phone survey I did to a few of these types showed their advertising investment was anywhere between one and four percent of sales. They also indicated that they planned to invest more in advertising and promotion in 1983. Their investment in advertising is 33 to 100 times greater than the bulk manufacturer.

The third, and a growing class, combines both marketing strategies. They do some manufacturing primarily for one buyer and market consumer type products as well. What they spend on advertising tracks pretty much the same as the two types of manufacturers described above. There is almost no investment in advertising on bulk sales and substantial investment on consumer sales.

There is a trend that I see emerging in the cheese industry that I will call a dividing of the marketplace and it is based on size of the plant.

Plants running less than 500,000 pounds of milk per day are turning more and more toward producing specialty, high quality cheeses and aiming at more direct sales. This is, I believe, a result of the surplus situation which has made dealing with bulk buyers less certain, severe tightening of what they are paid for their cheese, and competition for milk primarily on pay price. Of course, there is also the promise of more profitability.

Plants running more than 500,000 pounds per day are taking over the bulk product market. Their profitability and ability to pay for milk is dependent on the efficiencies of scale their larger plant enjoys.

The Purdue study showed that while these large plants did not get as much yield from their milk as the small plant, they produced twice the pounds of cheese per hour of labor and labor cost per pound of cheese produced was only two-thirds that of the small plant. And, their utilization of plant capacity was 66 percent compared to the small plant's 40 percent. These plants will provide the barrel cheese needed for producing processed cheese and the forty pound blocks for large cutting and packaging operations.

The trend outlined above will continue as small bulk producers get caught in the crunch between price received for cheese and price they must pay for their milk.

Before I leave this discussion of manufacturers, I would like to describe to you a phenomena that I believe exists only in the dairy industry. I believe it, in and of itself, makes a strong case for farmer participation in generic advertising. It is the implied contract that exists between the farmer and his milk handler.

The implied contract says that the handler will pick up and pay for whatever amount of milk the farmer produces, no questions asked. That is really quite a guarantee. To increase his sales, all the farmer has to do is increase his production.

Now, if I was a manufacturer of golf tees, selling about 1,000 tees per day, and needing two trees per day to produce those tees, that is all I would buy. If my tree supplier increased his production so that my truck rolled in with three trees on it, I would call the producer and tell him "Sorry, I will only buy two trees per day."

A cheese plant on the other hand can't call the farmer and say "Hey, look, you increased your production 20 percent, but I don't need the additional milk", we all know where the farmer would be the next day, and it wouldn't be at the same plant.

Now, there are those of you sitting in the audience saying to yourself, so what, he can sell the cheese he can't sell commercially to the government. No problem. Sorry, it is a big problem if the plant isn't making 40 pound cheddar blocks or cheddar fiber barrels. The government buys only cheddar cheese. If you are making mozzarella, swiss or brick cheese, you are out of luck. And, they only buy minimum lots of 36,000 pounds, aged 10 days before grading. The average plant in Wisconsin produces 9000 pounds of cheese per day. And, from the day of receiving milk to getting paid by the government for cheese sold, they have to wait 45 to 60 days. Farmers expect to get paid a little sooner than that for their milk, I believe. So the government really does not alleviate the burden on the handler of the implied contract.

Years ago this was not such a big problem because most plants had an implied contract with the processor-wholesaler who would take all the cheese produced from farmer milk. Given the surplus situation we are now in, the cost of carrying inventory, and changes in government surplus purchase policies, this contract between manufacturer and processor is becoming extinct. And, the trend of smaller plants toward direct marketing is definitely a factor.

The information about manufacturers just provided should give you some insight into their point of view on advertising.

Another factor in advertising dairy products, and who does it, is the marketplace, where dairy products are sold. How milk is currently utilized and how dairy products are sold and reach the public are important also.

Rough estimates on the utilization of milk are that about 49 percent of the milk marketed commercially goes into the bottle, 25 percent is sold in the form of cheese, and the remainder in butter, yogurt, ice cream, etc.

These products reach the consumer directly in retail stores, packaged and sold on their own, or as an ingredient in prepared foods such as frozen pizza, vegetables with cheese sauce, those sort of products. The consumer also gets dairy products through foods served at restaurants, fast food chains, school lunch programs, and this is a large part of the market.

One thing I believe everyone in the dairy industry must recognize, if they have not already, is that the consumer does not have to buy dairy products. There are all kinds of alternatives to drink, eat, and snack on. Simply put, we are competing for the consumer's food dollars against many other products. The fact that milk is nature's most perfect food doesn't really carry that much weight. Just because it is good for you doesn't mean you will buy it; just as if something is bad for you, like cigarettes, doesn't mean you won't buy it.

The average American citizen is eating 35 percent of their meals outside the home. Kids can be served milk at home, but when the choice is theirs, how many ask for milk at McDonalds? And, when was the last time you were asked if you wanted milk in a restaurant?

I was pleasantly surprised to see that dairy product sales increases in 1982 actually exceeded the increase in production by about 500 million pounds milk equivalent. Cheese sales increased 3.2%, butter 1.2%, and skim and lowfat milk about 1.1%, ice cream was up 1.8%. And, when you factor in the government giveaways on cheese and butter, cheese consumption increased 6.6%, and butter 4%.

Turning to the promotion of dairy products, I would like to share my view of the current situation, and then try to relate to you what I think all this information indicates is needed.

Currently, the promotion is centered in two areas. State programs enjoy the most participation by farmers. Thanks to a number of state mandatory check-off programs, such as what you have here in New York, dollars are being spent. Naturally, the dollars raised by these state programs are spent in promoting the state's products. That promotion is usually limited to regional type advertising.

While the UDIA is making a valiant effort, they do not enjoy consistent, adequate, wide-spread support.

There is little participation in generic programs by manufacturers. One reason for this is that I am not aware of any ongoing solicitation of financial support from dairy plants. Yes, some of these plants, or their trade associations, occasionally donate funds to state ADAs, but I am not aware of any organized effort to get them financially involved. Also, as the trend in manufacturers marketing continue, plants marketing direct are investing a healthy amount in private brand advertising and promotion. The Wisconsin Cheese Makers Association is seriously considering remedying this situation by bringing back to life the Wisconsin Cheese Foundation. It would exist only to give manufacturers a place to contribute to generic advertising. These funds would then be distributed by the Foundation to State and National programs.

And, frankly, the dairy industry has shown about the same ability to get together on advertising and promotion as it is presently demonstrating in cooperating on developing a surplus reduction plan.

It's like the man who died and went to heaven. When greeted by Saint Peter he said, "I'm sure glad to be here, but frankly, I would really like to see what Hell is like." Down they went and they arrived in a huge banquet hall where tables were filled with all kinds of wonderful foods and yet the people sitting around the tables were starving. When the man asked how this could be, Saint Peter said they were given four foot long chop sticks to eat with and couldn't get the food into their mouths. On the way back up, Saint Peter told the man that they ate with four foot long chop sticks in Heaven, too. Noting the look of surprise and dismay on the man's face. Saint Peter said, "Don't worry. The difference is that in Heaven we feed each other."

Changes have to be made in the near future if advertising is going to have a significant impact on dairy products consumption.

First, there must be an organized effort by all dairy states and the UDIA to develop and fund a solid national generic advertising campaign. I do not believe the best way to go about this is a national mandatory check-off program, but rather mandatory state check-off programs.

While I personally am opposed to anything that is mandatory, I make the exception when it comes to dairy farmer participation in advertising and promotion programs. My reason for this is the implied contract situation that the farmer has with the milk handlers I discussed earlier. Every farmer benefits from this situation and therefore every farmer should participate in the efforts to sell dairy products.

If each state would adopt a 1 percent check-off, $176 million dollars would be raised. I would propose that a percent of this money, not less than 20 percent, would be channeled to the national program.

Every segment of the milk marketing chain should be involved in advertising and promotion; the farmer, the plant-handler, the wholesaler-distributor. If the plant does not spend much on advertising, he can contribute to either the state or national program.

Generic advertising of dairy products is an absolute must and an important part of industry advertising efforts. Generic advertising will compliment the private brand advertising done, plus provide advertising nationally that is not done by private brand advertisers.

Look at fluid milk and how it is marketed. The nature of the product dictates that generic advertising is a must. First of all, fluid milk sales are regional because of the perishability of the product. Add to this the fact that due to the very narrow margins involved in selling bottled milk, little private brand advertising goes on. Therefore, generic advertising done both regionally and nationally can certainly boost sales.

There are those in the industry who will say that generic advertising does not have a place and that farmer funds should be funneled into brand advertising. I must strongly disagree.

Generic advertising can and should do things that private brand advertising cannot, or will not do.

First, there are numerous concepts the consumer has about the cholesterol factor in dairy products and other health concerns raised by various medical research done on rats. I personally have never seen a private brand ad address and disspell these concerns.

Secondly, one has to look at the eating patterns of Americans and the growing trend toward meals taken away from home. Ads directing the consumer to order milk, eat dishes with cheese in them, and have ice cream on pie must be done, and generic advertising can do that.

The current Real Seal ads being run advising consumers to be aware of products containing artificial dairy products and to look for the Real Seal are another good example of the consumer education function of generic advertising.

Generic advertising, co-ordinated nationally and regionally, will compliment private brand advertising extremely well.

Now, how does all this tie into the topic I was supposed to present--the manufacturer's point of view on dairy products advertising.

Philosophically, more and more manufacturers are realizing the importance of marketing of which advertising is an important part. Financially, I believe they would be willing to get involved with generic advertising if they have not already made a substantial commitment to brand advertising their products. One common concern they have with farmers is that funds are being invested properly. In Wisconsin, a common question I hear is how come the ADA of Wisconsin is spending so much on 'Drink Milk' ads and so little on cheese advertising when nearly 70 percent of all Wisconsin milk goes into cheese? The answer is that 85 percent of all milk produced in Wisconsin has to be sold in one form or another out of state, so naturally the greatest portion of promotional funds are being spent out of state. And, sales promotion is not just TV, radio, and newspaper ads, but involves other things like Wisconsin Cheese Festivals, point of purchase ads, and other displays and brochures. Better communication will certainly help quiet these concerns.

Those manufacturers doing private brand advertising will probably not participate as heavily in generic advertising, but will perhaps be more willing to participate because they have a better feel of what advertising can do.

And, should a way of channeling their participation be established, such as the Wisconsin Cheese Foundation, it would certainly seem that solid manufacturer participation is likely.

In closing, let me tell you that I believe the best years for the dairy industry lay ahead, if as an industry we all get better at marketing our product. Marketing is not just advertising and selling, but includes product development, packaging development, etc.

Manufacturers must continue to develop new types, varieties, and flavors of products. Better packaging, more attractive packaging must also come. And, we must re-educate the consumer to the benefits of dairy products as well as advertise them effectively.

All members of the dairy industry must participate and get involved in the needed increased marketing efforts. And those spending money on advertising must demand that those dollars bring results.

Yes, the dairy industry is presently in less than desirable circumstances with the current surplus situation. Financially there may be some tough times ahead especially for farmers depending on which turn the support program takes. But, let me urge you to make a firm commitment to promote dairy products aggressively and effectively. When things get tough the first tendency is to cut back on advertising. I have seen this happen in companies and invariably their recovery in sales lags far behind those who maintained their commitment to advertising.

I hope my comments have made some sense and been clearer to you than was the attorney who asked a witness, "Now, sir, did you, or did you not, on the date in question, or at any other time, previously or subsequently, say or even intimate to the defendant, or anyone else, alone or with anyone, whether a friend or mere acquaintance, or, in fact, a stranger, that the statement imputed to you, whether just or unjust, and denied by the plaintiff, was a matter of no moment? Answer the question yes or no." To which the witness replied, "Yes or no to what?"

SOME VIEWPOINTS ON BRANDED ADVERTISING OF DAIRY PRODUCTS

Albert J. Ortego, Jr.

A discussion of advertising branded products requires comparison with the alternative of non-brand advertising, often called generic advertising. Views expressed are my own, and are presented as such.

The basic concept behind brand advertising is that its basic objectives differ from those of non-brand advertising. Brand advertising is directed toward expanding the share of the market held by that brand or to be able to obtain a given sales volume at a higher price than that of competitors. Brand advertising has a volume objective or a price objective, or both. Brand advertising is directed toward other brands of the same product. In the case of non-brand advertising, the basic objective is to expand the total market for a commodity. As an economist would say, "...to shift the demand curve upward or to the right." There is no concern for which brand is taken. Additional sales of the industry product at the expense of some other industry's product (such as other beverages) is the goal being sought. Because of demographic changes, changes in lifestyles, and other changes previously covered at this Conference, maintaining per capita sales may be just as reasonable an objective for fluid milk as is expanding sales. Without an effective program to maintain per capita consumption, the forces at work against us will certainly reduce it.

With brand advertising, the idea is to increase your market share or to get a higher price without loss of volume. In my opinion, the objective of brand advertising is to make the firm's demand kinked so that when it raises its price, the consumer preference would be so strong that the firm would lose no sales. If the firm lowered its price, it would result in consumers shifting from other brands to its brand.

Research on the effectiveness of non-brand advertising has been done. Studies were done by Michigan State, UDIA and others. These studies show that advertising can effectively generate an acceptable return on expenditures. The funds must be adequate and spent in an effective program. The question then becomes: What would be the effect of spending the same amount of money in brand advertising. How do total market sales respond to brand advertising? There is a lack of research on the effect of brand advertising.

Why has the dairy industry done so much non-brand advertising? Research shows it pays. The dairy industry is not alone--The Florida Citrus Commission, the cotton producers, and recently the International Coffee Association have commodity advertising programs. The International Coffee Association has set up a program to spend $24 million advertising coffee in the United States market to try to offset the downward trend in coffee consumption.

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There are many who advocate that brand advertising would do as much for total sales as non-brand advertising. Good research is needed to get the answer to the question of "brand or non-brand--which is better?" Until then, we have only opinions. The econometric model used to evaluate non-brand advertising can be modified to evaluate brand advertising. If a study showed that both were effective, then there is the problem of determining the right combinations. Brand advertising must provide a net return to the company doing the advertising. There are a number of deterrents today in the marketplace against brand advertising of fluid milk.

First, the "private label" or store brands have become more prevalent. Private label milk is sold primarily on price. It's used as a loss leader to get people in the store, not only to purchase that product but to increase the store's total sales. When advertising is done on private label products, it's not generally product specific. For example: an ad featuring the store labels may include milk, but it will not be advertising milk as such. It features all of the store labels.

Secondly, the plastic gallon has made milk more of a commodity. It doesn't permit much distinction in the package. Package distinction and recognition is needed for product differentiation. The plastic jug, to date, has not lent itself to package distinction. This may be the industry's fault. There has been too much concern for "making it cheap" rather than making it attractive and protecting quality. The gallon is where the largest volume of sales are and that container has been a deterrent to brand advertising.

Thirdly, advertising cost versus the market share or Average Consumer Visibility (ACV) is an important factor. Private labels leave brands with a small total share of the shelf space and the market. Even if you're 30 percent of a market but only in 30% of the retail outlets in an advertising area, consumers will not readily find your brand (it won't be in 70% of the stores) even if your advertising message is very effective. Lack of visibility raises the cost of brand advertising. Many companies will not advertise in an area unless they have a certain level of average consumer visibility.

Fourthly, the low net margins prevalent in milk processing discourage brand advertising. Excess processing capacity, along with excess milk production, has kept profits low in fluid milk processing and distribution. When margins are low there is a tendency to cut advertising. In fact, there are no funds generated to sustain an effective advertising program. Not only have the advertising expenditures been low, but other market and product development funds have been almost nonexistent.

Dairymen has done a lot of advertising on a brand basis as well as on a non-brand basis. Flav-O-Rich is a wholly-owned subsidiary of Dairymen. It processes and distributes refrigerated milk and dairy products. In 1977, a concerted, planned brand advertising program was initiated. The objectives were to make Flav-O-Rich the number one brand in consumer awareness over the Southeast. A total program was planned to do this. The total program consisted of media advertising, public relations, package design, logo, etc. In five years the Flav-O-Rich name changed from almost '0' in awareness to the Number One brand in awareness in the Southeast. Once awareness was achieved, the objective changed. The promotion and advertising program had as its new objective: To get the consumer to purchase the brand. In other words, in addition to being

aware of the brand, cause the consumer to buy it. It was an action program. As the official milk and ice cream of the Knoxville World's Fair, Flav-O-Rich embarked on a sweepstakes program. It was called "The World's Fair and Beyond." In conjunction with Delta Airlines, the grand prize was a free trip to the World's Fair and Beyond--any place Delta flew. Entry blanks were on the carton panel. Hence, it was easier to enter the Sweepstakes by buying Flav-O-Rich milk. I might add that this advertising program got the highest award given by the Milk Industry Foundation this year.

Our brand advertising is developed to coincide and fit in with non-brand advertising in the area. Promotion Services, Incorporated, a subsidiary of Dairymen, handles the planning and execution of all advertising and promotion programs. The program objectives are developed, followed by creation of a program that will meet the objectives. The budgets are then determined for non-brand advertising, for Flav-O-Rich advertising, and for FarmBest and Sip Ups advertising. The entire program development and implementation is coordinated through PSI. The components are designed to complement each other.

In summary, first, non-brand advertising has had analytical research that shows it is economically feasible if properly funded and properly programmed. Secondly, research on the effectiveness of brand advertising is needed, not only for the brand itself, but its impact on the total market. Brand advertising can build on the efforts of non-brand advertising.

Also, a brand may be advertised with an impressive program and with intensity; yet, if that brand has not secured shelf space in many stores, then the advertising will not sell the branded product. This makes two points: 1) the sales program must be a part of the total program, and 2) the sales effort must tie-in with the advertising effort. Your marketing and sales people must work in concert. Today, private labels are merchandised primarily on price. These labeled products are a significant part of the total market. Private labels are seldom advertised. Hence, dairy farmers cannot limit their efforts and depend on brand advertising alone to maintain or expand the sales of milk and dairy products. We believe that both are needed.

GENERIC ADVERTISING OF DAIRY PRODUCTS IN THE UNITED STATES: HOW EFFECTIVE ARE THE VARIOUS PROGRAMS AND WHY IS JAPAN INTERESTED IN THEM?

Donald Kullmann

About twenty-five years ago I took an advertising class at Central Missouri State University. A few phrases and quotes I remember from the class are: "It Pays to Advertise," "Sex Sells," and quotes such as: from a Proctor & Gamble executive, "Fifty percent of the cost of our products is spent on advertising and promotion;" from a General Motors executive, "We know that fifty percent of what we spend on advertising is ineffective; the trouble is, we don't know which fifty percent."

For the past sixteen years, I have served on various Dairy Council and Federal Order advertising and promotion boards and committees. I have helped determine how to spend millions of dollars of primarily dairy farmer monies for generic advertising and promotion. Each year the per capita consumption of milk fell and the explanation that was used to justify the expenditures was "Just think what would have happened if we had not spent what we did." I admit that I have thought to myself several times, "At the level of promotion that is being done, I wonder if results would have been any different if we would have done nothing."

When one compares the expenditures used to promote milk to those made to sell non-milk beverages, one gets the feeling that perhaps we are doing next to nothing (See Table 1). If you look at the per capita figures, you tend to get depressed (See Table 2). When one looks at studies, however, done on dollar returns on milk advertising, one gets encouraged to invest more and feels that there is hope (See Figure 1).

Does Non-Brand or Generic Milk Advertising Sell Milk?

Three studies of the relationship between advertising expenditures and milk sales conclude that "advertising does pay."

1. The six-market study conducted by American Dairy Association and USDA in 1963-1965 found that increasing milk advertising expenditures from 2 cents per person to 17 cents caused milk sales to go up 4.5 percent. Dairy farmers got back $1.68 for each dollar invested in advertising - a 68 percent return.

2. Cornell University studies, conducted in New York City from July 1976 to June, 1977, showed that milk sales rose 4.9 percent at 8.5 cents per capita advertising, compared to what they would have been with no advertising. Dairy farmers earned $2.69 for each dollar invested in non-brand milk advertising - a 169 percent net return.

3. Ten-market study by UDIA showed the average 1979 media expenditure in the ten-market study was 10.4 cents per capita which resulted in sales increases

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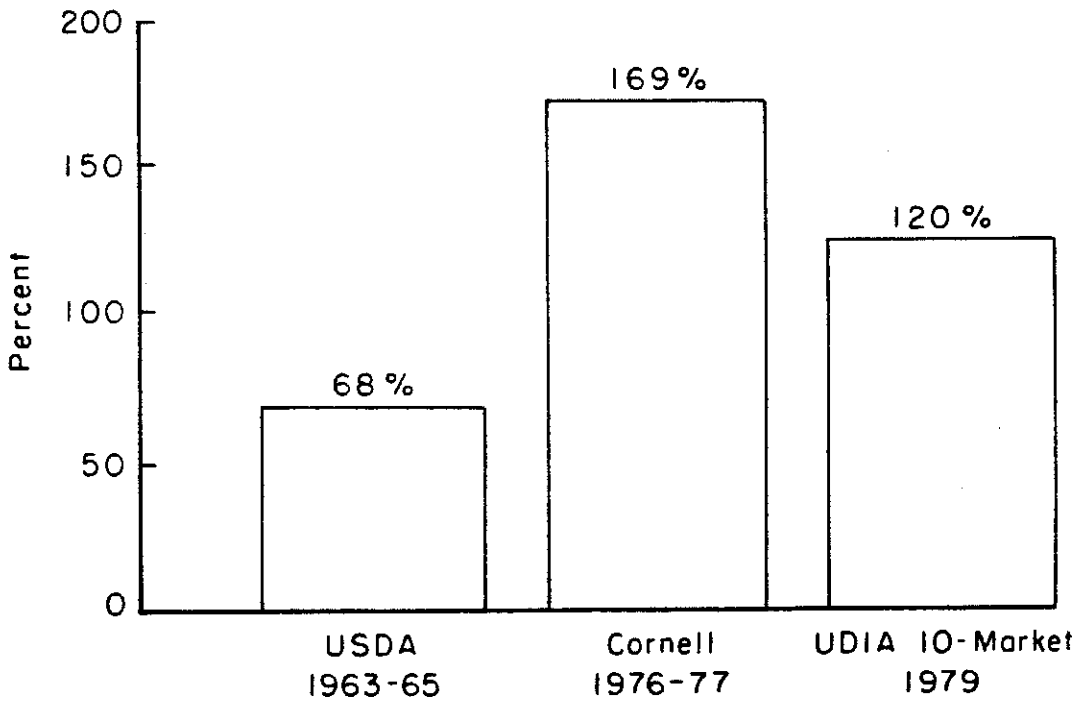
TABLE 1. Beverage Advertising Expenditures

Expenditures	1975 (millions)	1981 (millions)	% change
Non-Alcoholic Beverages	$262.3	$658.9	+151%
Soft drinks, powdered drinks, juices, coffee tea, bottled water			
Alcoholic Beverages	319.3	938.3	+194%
Beer, wine, liquor			
Milk	18.3	32.4	+77%
Total Beverage Advertising	$599.9	$1,629.6	+172%
Proportions of Expenditures			
For Every $1 Spent on Milk Advertising			
The Following is Spent for:			
Non-alcoholic beverages	$14	$20	
Alcoholic beverages	17	29	
TOTAL Beverages Besides Milk	$32	$49	

TABLE 2. Per Capita Sales of Individual Fluid Milk Products in Federal Milk Order Marketing Areas, with Comparisons, 1970 and 1980.

Fluid Milk Product	1970 (pounds)	1980	Change 1980 over 1970 (percent)
Total Whole Milk	211.20	144.73	-31.5
Total Lowfat Milk	32.59	72.08	+121.2
Total Skim Milk	11.40	11.44	.4
Total Lowfat and Skim Milk	51.42	94.38	83.5
Total Fluid Milk	262.62	239.11	-9.0

FIGURE I. STUDY RESULTS NET RETURN



averaging 3.6 percent compared to what they would have been with no advertising. Dairy farmers received $2.20 for each dollar invested in non-brand milk advertising - 120 percent net return. Americans drink nearly 6 billion gallons of milk a year. If we would drink 3.6 percent more as in the ten-market study, that would mean an increase of 209 million gallons or 1.8 billion pounds. If everyone in the USA would consume an additional 4 ounces of milk per day, this would generate about 25 billion pounds more consumption, and we would soon have a shortage of dairy products.

When I was asked to appear on this program, I told Dr. Kinnucan that I would take the Japanese approach to my presentation, which basically means: Let's have an open mind--Let's look at the facts regardless of whether it steps on someone's toes--Let's seek out how things are done elsewhere in the world--Let's analyze how they are being done elsewhere, and if more effectively done than what we do, Let's copy it! Now that I'm aware that there are representatives from ADA's advertising agency and someone from California's Milk Advisory Board in the audience, I may be initiating another Pearl Harbor.

Over the past many years, I feel we have had some developments take place in the dairy industry that, in my opinion, have contributed to loss of milk consumption:

1. The dairy industry is willing to spend only $1.00 against $49.00 spent on other beverages.

2. The dairy industry has not priced their product to allow advertising and promotion expenditures.

3. Supermarkets have forced dairies out of their own brand or label.

4. The dairy industry has been lulled to sleep believing milk will sell itself.

5. Advertising in the past has been bland and not motivational.

Today, in the brief time I have, I wish to review the current UDIA television program and two other advertising programs in two areas of the United States where there apparently have been some statistical success stories--California and St. Louis, Missouri. Also, I will briefly reflect on my recent trip to Japan and discuss why the Japanese are interested in our milk advertising and promotion and show some of the things they have done. In the next few minutes I want you to be the judges of how effective generic advertising has been. In my opinion it is very difficult to measure.

The ADA Approach

Nearly one-half of all monies spent by the dairy industry to promote dairy products is associated with the United Dairy Industry Association.

Currently the ADA national theme is "Milk - The Fresher Refresher." The rationale behind the strategy emphasizes the fact that milk is a beverage and not a food. The advertising agency conducted a study that found that people rate beverages on three broad dimensions:

1. Nurturance or various aspects of energy and strength and is associated with home and family with assurances of well being and vitality.

2. Sociality - appropriate to hospitality, pleasures, relaxation, as subject to peer influences and personal and social values.

3. Sensory gratification - suggests a set of beverage drinking pleasures: flavor and flavor variety, coolness, lightness, smoothness, sweetness, aroma, color, viscosity, texture, extending even to container design.

The agency found that milk has a very favored position on nurturance, but is low on sensory gratification and sociality. The creative strategy of "Fresher Refresher" is to strongly position milk on the sensory gratification dimension and raise its level on this dimension. Tracking results show (according to the agency) that this commercial is accomplishing this.

Currently the ADA advertising strategy for fluid milk is as follows:

1. Single target audience: Persons 12 - 34 years old.

2. Schedule television as the primary medium on prime time.

3. Utilize radio to maximize frequency of the advertising message on weekends and weekday evenings.

Not all areas of the country have accepted the national ADA advertising and promotion program. I will discuss two of these areas. The first area is California.

California Milk Advisory Board (CMAB)

In the summer of 1969, a group of California dairymen met with the Department of Food and Agriculture to find a way to reverse declining fluid milk sales. The dairymen agreed to an automatic .5 percent revenue levy checked off their milk checks. This generated $2.5 million with $1.5 million to be used for advertising. In its first year, the CMAB's aggressive "Every Body Needs Milk" advertising and promotion campaign was launched. The "bikini girl" became famous, including lawsuits, but it did generate "awareness".

According to CMAB, in their first year they were able to stop the per capita milk consumption decline they had experienced since 1950 (See Figure 2). I am aware that there is some controversy over what is really affecting per capita milk sales in California--some claim advertising, some claim high milk solids, and some claim illegal aliens.

Some research findings by CMAB over the past decade include:

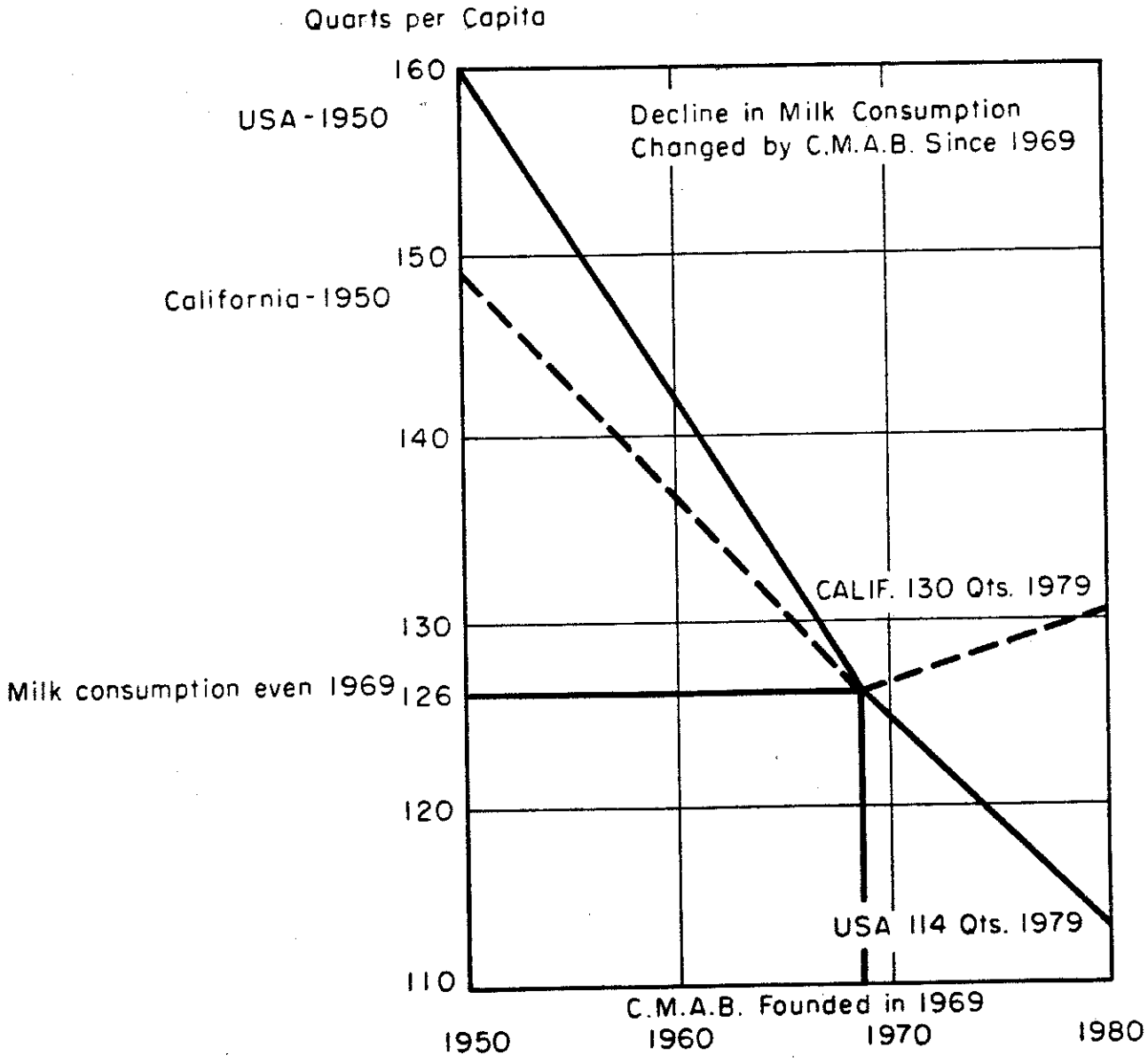
1. Milk is perceived as an "energy food and beverage".

2. Milk is not perceived as being in direct competition with soft drinks.

3. Milk is not a "social" beverage or food.

4. Milk's enemy is perceived to be "fat and calories".

FIGURE 2. MILK SALES - NATIONAL VS. CALIFORNIA



5. Price/value is not a major factor in purchasing milk.

6. Cholesterol is not a major issue among teens and young adults.

7. There are a number of consumers concerned about spoilage and running out of milk (before their next trip to the store).

Results like these help guide the advertising team in planning commercials, print advertisement, and billboards.

The California group is continually reviewing new research findings and developing new approaches to sell more dairy products. The group has changed advertising agencies several times in order to get the right program as they saw it.

Beginning in July of 1971 the CMAB turned to celebrity spokespersons touting the value of their milk drinking habits. The slogan has changed from "Every Body Needs Milk" to "Milk Has Something for Every Body" to "Any Time is the Right Time for Milk" to "There is Nothing Like Something With Milk" to the present campaign, "Drinking Milk for Good". The CMAB's success in turning around negative per capita consumption of fluid milk trends indicates what is possible. The California group also shows me that they are not bashful about changing advertising agencies or themes if they feel that a certain approach is losing its effectiveness. Their budget is about $16 million per year - 100 percent participation.

St. Louis, Missouri, Dairy Farmers

Dairy farmers in the St. Louis, Missouri area also became disenchanted with the national ADA advertising and in the Fall of 1981, they secured their own advertising agency to see what they could do. They reasoned, if California could do it, why not St. Louis. Some assumptions and observations that the St. Louis agency made were:

1. The competition for the youth market is fierce--there are more drinking alternatives and less parental direction in terms of enforcing milk consumption.

2. Milk falls into a drink category you leave behind. It's not that people reject milk because of taste or consistency; it's just that age moves them into different life styles.

3. Milk is not a social drink--it's a personal drink.

4. The case for milk does not have to be argued; communication should use the knowledge of milk's goodness as a point of advancement, not stop to explain it.

5. We're dealing with a healthful, natural product, always consumed in childhood.

6. The feeling is that the most realistic task is to expand the market in terms of numbers of milk drinkers rather than to get current drinkers to drink more.

7. The feeling is that we should not be talking directly to children, but rather to those people who not only affect purchase but also have merely grown away from the "habit" of drinking milk.

8. Advertising strategy:

   a. The target audience is defined as women, age 25 - 49. This target is viewed as the primary purchasing agent for the family. She's the one who generally puts the food on the table, including the beverage, and the one who brings it into the house. Experiences indicate that adult female pressure gets the job done.

   b. Television is the primary medium to be recommended, with some radio support. The level of television pressure should be significant, enough to be felt in the market place. The hard earned advertising dollars should not be fragmented to provide a little for everybody. They should be concentrated to do the job.

   c. Use the most cost-efficient "time of day" to reach the woman purchaser--daytime TV. Fifty percent of women are homemakers and can be reached most efficiently in this way. Add evening viewing times to reach the working mother, but only use "early and late fringe times" steering clear of "prime time".

   d. Message should be directed to one individual--don't let anyone off the hook. Make <u>you</u> responsible for <u>you</u>.

The current annual budget for the St. Louis area is $850,000 per year. The program started in February, 1982 at a $615,000 annual level. The annual level was increased to the $850,000 on October 11, 1982. For the sales results see Figure 3.

Why Are the Japanese Interested in United States' Advertising and Promotion?

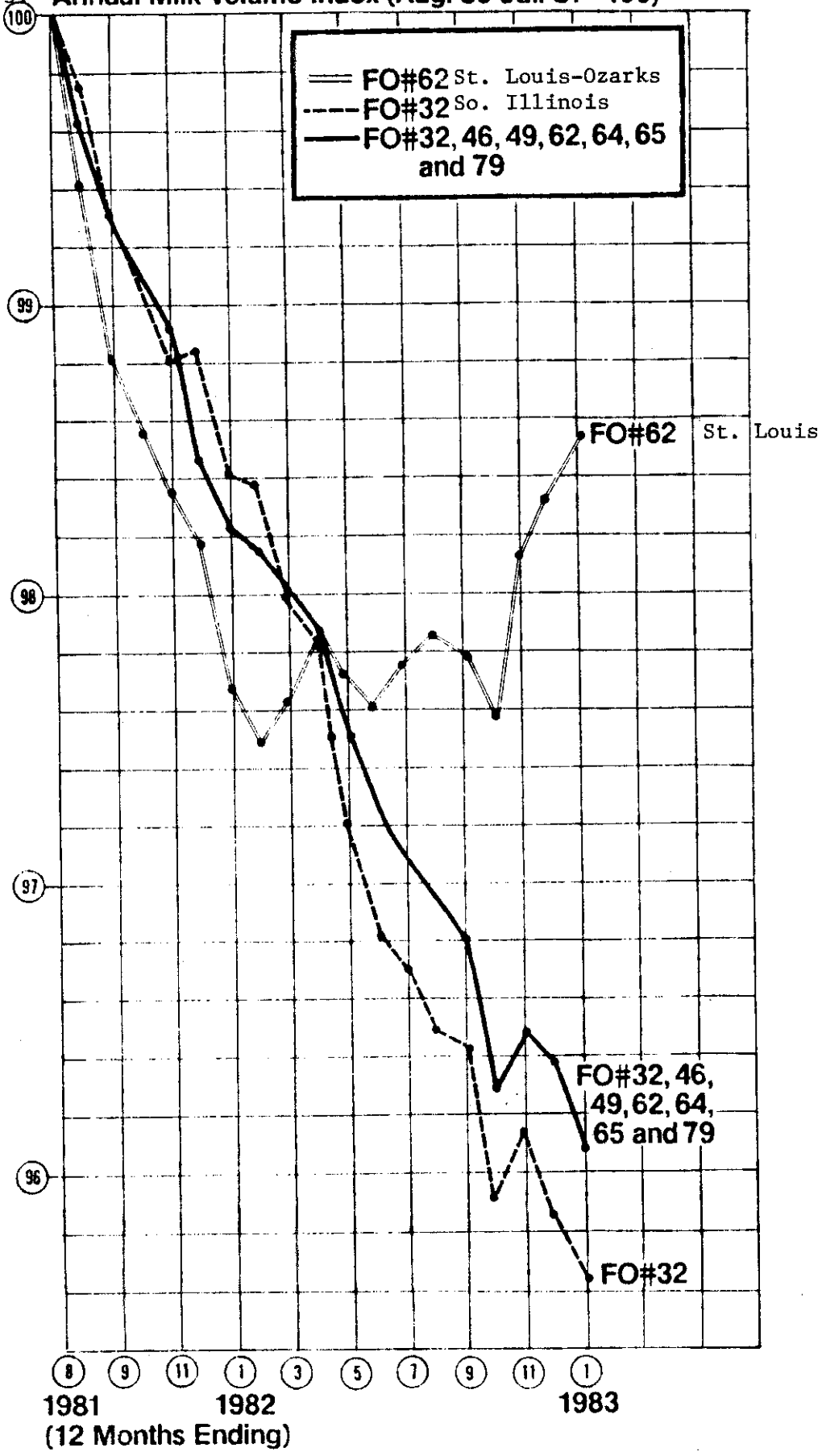
In my opinion, the Japanese are interested in what we are doing in the USA regarding advertising and promotion because of the following personal observations:

1. They have learned to breed, feed, and milk cows. They have the highest milk production average per cow of any country in the world--in fact, 1,500 pounds higher than the United States.

2. They will protect their agriculture against all outside influence and must assure its existence. Dairying is one of the best agricultural enterprises for them when one looks at their land base and their comparative disadvantage in producing grain and meat. They can not and will not be dependent on the world for their food supply.

3. Per capita consumption of fluid milk is about 70 pounds compared to the United States' level of about 240 pounds. Potential is there.

FIGURE 3. Annual Milk Volume Index (Aug. 80-Jul. 81=100)



4. Per capita consumption is increasing about 4 percent per year; however, per capita production is increasing at about 7 percent per year, so they foresee dairy surpluses which will force curtailment of this important agricultural enterprise.

So the Japanese dairy industry is looking for ways to increase milk consumption in Japan. What is the Japanese approach?

1. They are sending people out into the world and bringing people to Japan to explain how others are advertising milk.

2. They enlist various companies who are bringing products into Japan to help find ways to sell more dairy products. Case in point: American Soybean Association and Donald Kullmann. It was pointed out to the American Soybean Association by the Japanese that Japan is one of the largest importers of United States soybeans, and that dairy cows consume a lot of soybeans. If more milk is consumed, there will be a need for more dairy cows, and if there is a need for more dairy cows, they will need more soybeans. So you can see why the American Soybean Association paid my way to Japan last December.

Since milk is a relatively new food in the Japanese diet, they have spent much of their effort on milk awareness. Apparently the Japanese took the same advertising class I did twenty-five years ago, because they seem to use the principle that "Sex Sells" (nude models). These two awareness posters were developed by the Kumamota Federation of Dairy Cooperatives on the south Kyushu Island in Kumamoto Prefecture. The cooperative claims this promotion boosted milk sales by 15 percent; however, it created much controversy among the wives of the dairymen. Now that they have pursued the awareness approach, they are also concentrating on the other aspects of milk, such as the health and nutritional values of dairy products (See the list of ads and promotional materials in Table 3).

Some results of milk promotion in Japan are shown in Figure 4. The Hokkaido Island produces about 4.3 billion pounds of milk annually. The population is 5.5 million people. The $8.9 million advertising expenditure in 1979 and 1980 represented annually 21 cents per hundredweight on all milk and $1.62 per person. After this intensive promotion, they plan to spend about $2.2 million annually beginning in 1982, which represents about 5.1 cents per hundredweight of milk produced and 40 cents per person.

In summary, I am not sure how effective generic advertising has been in the past. It appears that it can be effective if done right and financed at a level to do it right. Perhaps the dairy industry should consider what some have proposed; that is, take the current monies spent on generic advertising and give, on a matching fund basis, to any operating dairy that will use the money to promote milk, even if it's their own brand. Maybe a local or regional approach is better than a national approach. I do believe we should also use the Japanese approach and send out, seek out, and review what is being done in the world and then analyze and copy it if it is better than what we have. We need to be more innovative in trying to find a more effective way to sell milk. The perfect way apparently has not been discovered as yet.

I challenge Cornell or any university to go to California and St. Louis, Missouri, and study what is happening there and determine what really were the significant factors that turned around declining milk sales in these two geographic areas. During my academic career, universities were always looking for situations to study--it would appear that these two areas would be quite interesting to study.

TABLE 3. Japanese Posters

Shake Up! - Young Power - Shape up with milk shake - Mix milk with your favorite vegetable juice for new taste.

Girl and Rope: Keep up your balance - Physical balance comes from balance of nutrition - Have milk every day with your meals.

Pregnant Woman: While you are knitting baby booties and waiting for the big event, don't forget to drink milk every day.

Father and Son: I like it - That's why I'm healthy.

Two Kids and Cow: Let's become healthier with milk - one glass of milk is full of good health.

Girl in bibs: Milk is Great.

Milk T-shirt: It is milk - So I'm healthy - Have you forgotten the balance of nutrition?

Athletes: We are in the early 20's - Top condition, mentally and physically, comes from milk - Have you forgotten the balance of nutrition? Of Course, Milk's the One.

Pamphlet for new pupils of primary schools - over 2,000,000 copies distributed.

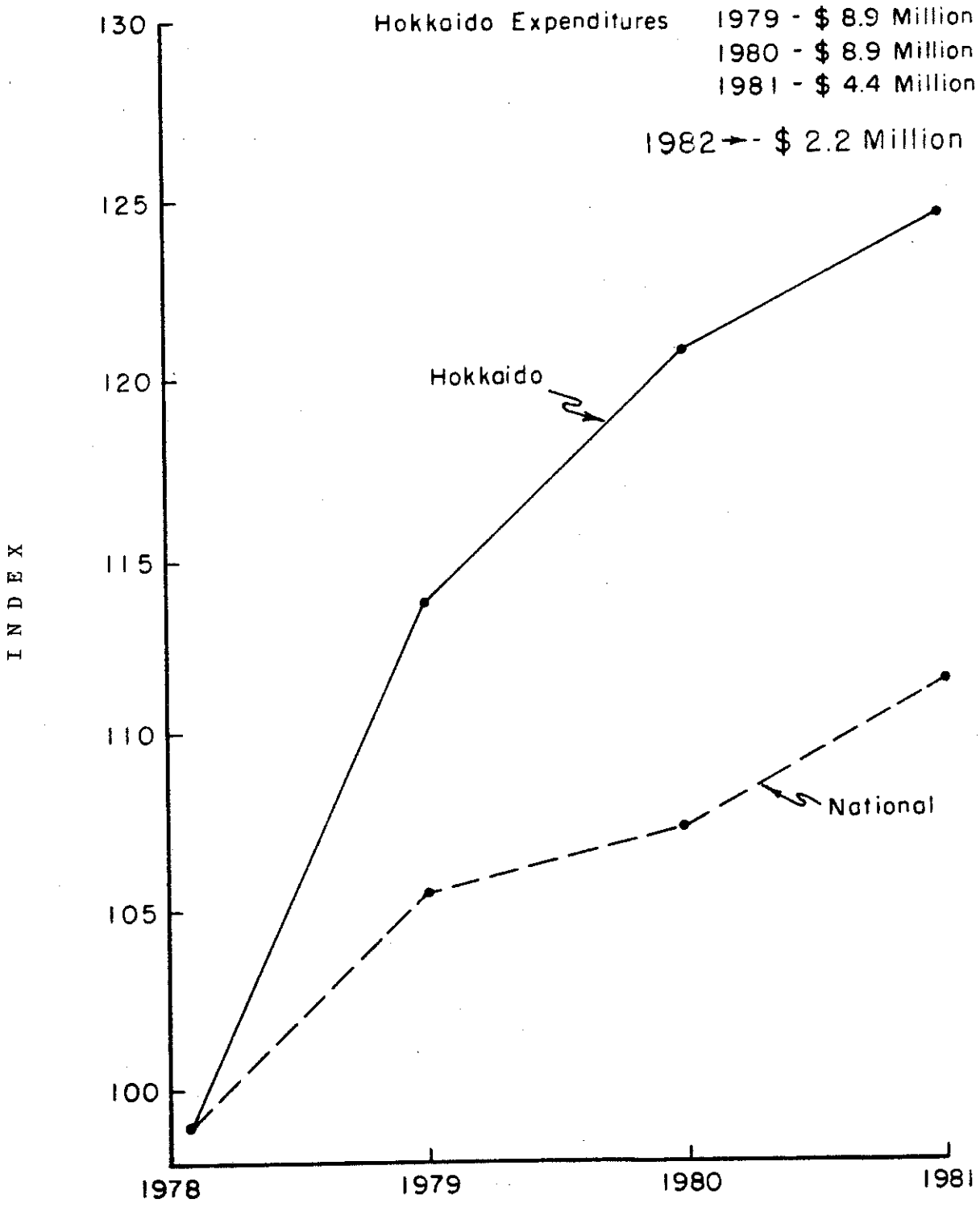
Book: "Milk and Calcium."

Pamphlet: "Milk Book" - The story of milk from farm to consumer and pointing out the food value of milk.

Cooking pamphlet: "The Milk Dishes Fit For Rice."

Pamphlet: "Milk Shakes."

FIGURE 4. PER CAPITA CONSUMPTION OF MILK- HOKKAIDO ISLAND VS. TOTAL JAPAN (1978=100)



WHY AREN'T WE SELLING MORE MILK: THE VIEW FROM BORDEN'S

William Baar

Bob Kirby, Group Vice President for the Borden Dairy Group, was planning to attend; however, a last-minute change made it impossible for him to do so. He is my boss, in fact, he has been my boss twice. Once while I was with the Continental Grain Company, and now with Borden. I spent a number of years with the Continental Grain Company, during which time we made a number of acquisitions of bakeries. I don't know how much of this will come out today, but there are many parallels between the industries. They are plagued with some of the same problems.

In any event, my background is a little bit different than most because I've spent really my entire life in grocery products. I'm not, unfortunately, or fortunately, a longtime dairyman so I don't know all the things that we can't do yet, and it seems that there is, in every industry, a certain mentality with which we must contend. So we'll look at it from a few different perspectives, things that I think are relevant, and some things that you may or may not consider to be so.

As all of us who are here know, but not all people throughout our grocery product business understand, the dairy business is enormous. I could stand here and quote hundreds of businesses that are in the hundred million dollar range that are very successful and very important. So many companies are measured by the hundreds of millions; however, our business is measured by the tens of billions. When you talk in dairy terms of tens of billions of dollars, it is clear that we are dealing with a tremendous business. And I guess I'd have to stop and really pay tribute to those who have been around a long time, and who have taken it to those particular levels. We have been talking about sliding per capita consumption and so forth, but someone, a long time ago, must have done an amazing job to take it to where it is today. So we've got an awfully big heritage that we have to respect and take care of as well.

Over the years, dairy has been an important part of American history. The positive image of dairy products has continued; and the consumer perceives our products as being wholesome, highly nutritious, and a source of energy. Dairy products are thought to be good tasting and good for you. In fact, milk is often characterized as nature's most nearly perfect food, and is largely consumed because of its nutritional content. We can debate that all we want to, but research will prove these basic things to be factual.

Dairy is, unfortunately, commodity oriented, with a declining per capita consumption in certain key categories. Dairy does, however, present many exciting opportunities for continued growth; but it will require redirected objectives and changed attitudes.

The author is Vice President of Sales in the Dairy Group, Consumer Products Division, Borden Inc., Houston, Texas.

These changed attitudes that I speak of can best be explained by comparing today's dairy industry with another agriculturally-based industry, California wine. So for the next few minutes bear with me. I spent a few years with Ernest Gallo in the wine business and the things that took place there over the years, I think, have some application and I feel we should take the time to reflect on them.

One of the healthiest and fastest growing agriculturally-based product categories is California wine. Per capita consumption has increased every year for more that 15 years. Prices have increased at an even faster rate, and the profits, believe it or not, are going primarily to farmers and processors. Total wine consumption in 1980 was double that of 1970. Bottle prices of standard table wines have nearly doubled from 98¢ a bottle to $1.80. Moreover, the average price for a bottle of wine has increased during the same period from approximately $1.10 to $2.50. Premium priced products have exceeded that of standard priced wines. This healthy and profitable growth in the wine industry closely parallels, and in a large part is the result of, the growth of branded competition which increased dramatically in the 60's and 70's.

Following the repeal of prohibition in 1933, the United States wine industry began a long, slow period of rebuilding. During the 30's and 40's the products were predominately low priced, high alcohol, sweet and dessert wines which returned little profit to the farmers and processors. For those of us who are old enough to remember the 30's and 40's, there were only two kinds of people who drank wine - the wealthy and the wino. That's basically the way the wine business was divided in those years. But as you can see, to quote the cigarette commercial, we have come a long way, baby, as far as the way in which wine is universally used today.

In the mid-30's, the California Wine Advisory Board was created to promote California wines. It was funded through a per-gallon tax on wines produced, and was designed to build public awareness for California wines through advertising, especially table wines as a food accompaniment.

The results of this program were mixed. Per capita consumption of California wines grew slowly but prices generally lagged behind. As late as the early 1960's, the wine industry could be characterized as sluggish in growth and only marginally profitable. Total brand advertising was at a very low level and done by only a few processors. The dominance of advertising by the Wine Advisory Board caused consumers to perceive California wines as "cheap", "undistinguished", and "all alike." Only a handful of California aficionados were aware that quality wines could be, and were being, produced in California.

In the mid 1960's, the marketers such as Seagram, National Distillers, and others entered the wine business through acquisitions. At the same time, a number of small wineries emerged producing high quality varietal wines. Then wine began to be marketed strongly on a product differential basis, focusing on traditional table wines. At the same time, the total amount of money spent for advertising grew from less than $30 million in 1970, to more than $200 million in 1980, as brands fought for an increased share of the market.

The processors were literally picking themselves up by their boot straps. Meanwhile, as the awareness of California wines was changing, the consumer perception of wines was changing. No longer was price the thing. It was taste,

quality, variety, size, usage and pride of service. This brand competition, while profitable for wineries, also changed the market share at the processor level. The two largest wineries now have significantly lower shares of the total market.

There's a message here for the dairy industry. The present trend toward commodity marketing in the fluid milk industry shows a pattern similar to that of the wine industry in the 30's and 40's. Just as the wine industry reversed this trend through strong brand competition, it is quite possible that strong brand competition would be equally beneficial for the dairy processor and farmer.

It's alarming to me that the dairy industry as a group has been unwilling or unable to spark a campaign for its own products. In contrast, other beverage industries, especially soft drinks, wine, beer, coffee and tea, have done an excellent job. Milk has enormous underlying strengths. It is a product with high quality, integrity, and nutritional attributes.

A short time ago, Borden owned a number of soft drink bottling operations, which we disposed of last year. It gave me an insight--although I've been exposed to it for many years--into all the negative aspects every other business seems to have to overcome (milk's cholesterol and fat problems notwithstanding). I don't know how anyone could promote and sell a product like soft drinks. If you could tell me one socially redeeming factor soft drinks have other than their so-called sociability, I don't know what it is.

If you read their manuals, you wouldn't believe it when they talk about how to handle sensitive questions like caffeine. It's an overwhelming negative that they have to address. Coffee certainly isn't one of the great answers to everybody's prayer. And that goes many times over for beer and wine. We possess something that is so fragile, but so beautiful, that it seems strange that we can't do a better job than we have in selling our products to this country.

Milk has an enormous underlying strength. It's a product with high quality, integrity, and nutritional attributes. The importance of this is obvious when the volume, history, and per capita consumption are viewed relative to the advertising that has been placed against it. I have figures here that say soft drinks spent over $300 million in advertising last year. There may be other estimates around that may vary by $5 or $10 million dollars. The beer industry spends close to $400 million.

I don't know if you are aware of it, but the most unbelievable studies have taken place in the beverage industry. They can be called share of stomach studies. Up to this point the only thing they have not included is water as a beverage; but I think it is being included in this year's confidential publication. It is literally what you put into your stomach in the way of liquids. And they break it out demographically as well. It's done in the most minute detail you can imagine. And when you find out at what ages we start consuming milk and where we lose it and where coffee comes into play compared to soft drinks and teas and juices, it's an amazing thing. I personally feel that anything you put into your stomach in the way of a beverage is competition to milk. So when we're out there competing for that consumer, I perceive that anything that is basically sold as a liquid is in competition with fluid milk products.

Comparatively, the dairy industry as far as I estimate, does about $30 million of advertising of which about $23 million is used for generic products. I think that those who represent branded products ought to be ashamed of the amount of advertising dollars that are applied against the consumer. The way I phrase it here is that the dairy industry has been whispering the message while other beverage industries have been shouting their's. In reality, milk has done a miraculous job, as I said earlier, in holding on in light of the competitive barrage of advertising levelled against it. I do take exception to the fact that generic milk advertising says, milk is milk. This is simply not enough and it communicates a message that it is uniform and ordinary. In increasing numbers, executives are becoming convinced that the virtues of branded advertising and the weakness of generic advertising can live very compatibly. There is a base of advertising but that doesn't relieve us of the responsibility of picking up the gauntlet and applying our dollars where we think there is the growth potential. I'm really extending the challenge to people in positions such as mine, to move toward a position where we can have matching funds (farmer and processor) or to put money where we think our growth should be and that's in the future of dairy products.

The objective, and I think this is critical to what I want to say, must be to differentiate the product so that each can better meet the needs of the specific consumer group that it is positioned for. In almost every business in which I have been associated, we spent considerable dollars in segmentation studies. I am amazed at the mature businesses, and we found this when we got into the bread business, where there literally was no work done as far as segmentation. What the soft drink, beer, and cigarette people have done with segmentation studies and the way that they apply it to their resources for those particular segments, is exactly what I am talking about. People can say milk is milk and milk is good. I think that's terrific, but there comes a time when we have to say, our milk, our particular kind of milk, is better than any other, for these particular reasons, and get into that kind of competition.

For example, in our advertising, Borden has blended the time honored Elsie imagery with a new fast growing low-fat category in those markets where we sell a product called Hi-Pro, a low fat milk with added milk solids. On our commercial, the actor takes a drink and says, "Elsie, how did ya do it?" And what they're amazed about is that good old Elsie can make a low fat milk with a whole milk taste. That's what I am talking about when I refer to positioning something towards a particular segment.

I was involved thirty years ago in selling the first shelf space for pet food. And if you don't think that was funny, going into a supermarket chain with pet food. They threw me out! Can you believe that. They said an animal food in a food store, you gotta be crazy! Would you like to guess what kind of shelf spread you would have in a supermarket today. I'll give you a hundred dollars for every store that you find that does not have a gondola from the beginning of the store to the end of the store of solid pet foods. And the dog can't even read, write or hear the commercial--do you believe that? Can you believe the shelf space that pet food has in relation to dairy. Dairy products represent 10% of store sales. Someday, if you're really interested I'll tell you how much space dog and pet food have, but look at the space they occupy. They don't have the kind of returns or anything else that dairy has, but it comes back to your ability to carry it off from a sales point of view.

The dairy industry has to realize that advertising is an investment in the future. Many processors are falling all over themselves to sell their products on price alone. This usually leaves no margin for advertising, thus there's no real brand commitment or category development. This is exactly what was happening in the wine industry before it changed direction. It will take the dairy industry a number of years to turn itself around. And even more importantly, it will take an entire industry working together to do it. A single company like Borden, Dairymen, Inc., etc. cannot do it alone. Some encouraging signs are already appearing though. There is more advertising between boards and various milk industry advertising groups. Occasionally you hear comments about sharing a pool of funds with proprietary fluid handlers for advertising fluid milk; we at Borden would like to see a program whereby funds are shared by processors and producers. As I said earlier, possibly a matching fund program could be developed to kick off the brand advertising program. And when I say that, I'm talking about new dollars--not just a redirection but new dollars for matching funds.

In addition to brand advertising, the industry should give more attention to the total quality perception of their products by consumers. This not only includes the inherent technical quality of the product but cleanliness and things that we haven't really spent a great deal of time and money on. Graphic container design is the way we broke out of it in many other businesses. Those are critical issues. We must do a better job of understanding the consumer and her expectations of milk, and that is what segmentation studies are all about. Different people have different objectives. Some may want refreshments, others nutrition, others a social drink. Consumers fall into segments. The dairy industry has viewed groupings of consumers over the years, however, differences have largely been regarded as demographic and geographic. Most food industries today are looking more deeply into the consumer. They search for different perspectives to describe consumer groupings. These segments are increasingly characterized by their life styles, attitudes, and buying habits. They cluster consumers in new ways to give marketers new dimensions for gaining awareness and obtaining trial and reinforcing brands to stimulate business. We should be striving for new products and changes in existing products that are geared to meet consumer needs.

At Borden, research and development is one of the most critical aspects of the business. Much of our basic research is done right here at our Syracuse, New York Research Center. But many of our new ideas, as it is with businesses like dairy that have many plants, come from the local operation. The plants are where many new ideas are generated. They can be refined at Syracuse, but many times they come from the field. Our Borden Pudding Bars were developed in our Syracuse lab. You may not know it but Borden was the first to market aseptic orange juice in the U.S., and we too are studying all aspects of UHT fluid milk, recognizing perceived flavor differences, increased packaging costs, etc. And we applaud people who move out into different and dramatic things.

The last thing I want to comment on is that we are spending our money in a different way today and we will be in the future. Borden must realize that we have 56 or so plants and we have had to develop 56 or so different advertising approaches. We find every market different. All objectives are slightly different as well as how they match up. So we are doing a great deal of that. What you will see this year and next year is a dramatic shift in the way in which we at Borden are going to be addressing the marketplace from an advertising and promotion point of view.

Borden believes the dairy industry is fundamentally very healthy and has good growth potential. On this basis, we are committed to continue to grow with the industry. We will perform within the objectives of our shareholders for profit, growth, quality and integrity. Within these boundaries, we will help develop a more vital dairy industry by re-introducing the United States to premium dairy products through branded advertising. We will support this objective by introducing new products, by effective cost reductions, by sponsoring continued education, and by keeping in touch with the changing consumer. We recognize that the product mix in the dairy business is expanding and we must constantly adjust to this. We will continue to decentralize our commitments, placing more responsibility on our general managers at the local level. We look for possible mergers and/or joint ventures. We are looking for acquisitions, we are looking for growth. We believe in the business and we will continue to do that. Most importantly, we at Borden believe in the future of the industry.

RESEARCH FINDINGS RELATING TO GENERIC ADVERTISEMENT OF FLUID MILK IN NEW YORK STATE

Henry W. Kinnucan

At Cornell we have been investigating the effectiveness of generic advertisement of dairy products off and on for about eleven years. I would like to spend some time briefly summarizing the major findings of this research as it relates to fluid milk advertising in New York State.

The first question we sought to answer was a very basic one: Does media advertising, which is of a nonbrand nature, sell milk? To shed some light on this question we began conducting sales response studies in a number of markets throughout the State of New York where dairy farmers were funding media advertising campaigns for fluid milk. The results of these studies suggest that nonbrand media advertising does sell milk but there are tremendous intermarket differences in the ability of milk advertising to influence sales. For example, the studies suggest that a media campaign for fluid milk conducted in New York City produces a ten times larger sales response than does a similar campaign conducted in Albany or Syracuse and about a 3.3 times larger response than that obtained in Rochester (Figure 1). Moreover, the studies conducted so far suggest that not all Upstate markets are less responsive to milk advertising than New York City. A study recently completed of a producer-funded milk advertising campaign conducted in the Buffalo market over the period January 1978 - June 1981 found the sales response there 2.2 times larger than the New York City response.

The reasons for these apparent large intermarket differences in the ability of advertising to influence milk sales are not well understood. One might speculate that they are due to differences in the average levels of milk consumption that exist across the markets. For example, per capita milk sales in New York City are typically much lower than in Upstate markets. It may be easier to increase sales in a market where you are starting from a lower base level of sales than in a market where sales are already approaching a "satiation" level. This principle may be part of the reason why milk advertising in New York City was found to be so much more effective than in many of the Upstate markets.

Another factor that may be responsible for the apparently large intermarket differences in the sales response to milk advertising is the level of investment in advertising. According to the data we have, Buffalo receives more nonbrand media advertising of fluid milk than another market in New York State - about 2.2 times more on a per capita basis than the next most heavily advertised market New York City. A tenet of the advertising profession is that a certain minimal level of exposure is necessary for an advertising campaign to have any effect at all and beyond that threshold additional expenditures are required before the maximum sales response can be achieved. To the extent that present levels of investment in milk advertising are below the level required to achieve a maximum sales response one would expect to find larger response rates in markets where milk advertising levels are higher, other things being equal. The

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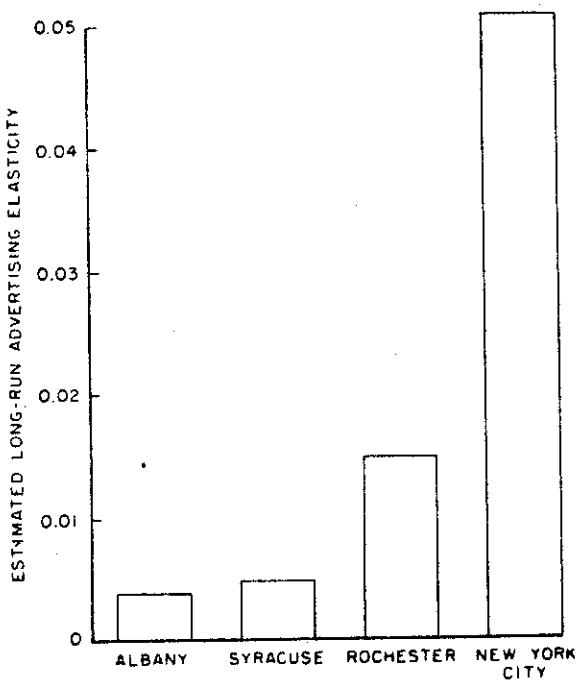
fact that the estimated sales response in the Buffalo market is 2.2 times larger than the estimated sales response in the New York City market does not necessarily mean that the 2.2 times larger per capita milk advertising investment in Buffalo is responsible for this difference. However, it may be a factor, especially when one considers the fact that per capita milk sales in the two markets are not greatly different (10.5 ounces per day in Buffalo compared to 9.0 ounces per day in New York City).

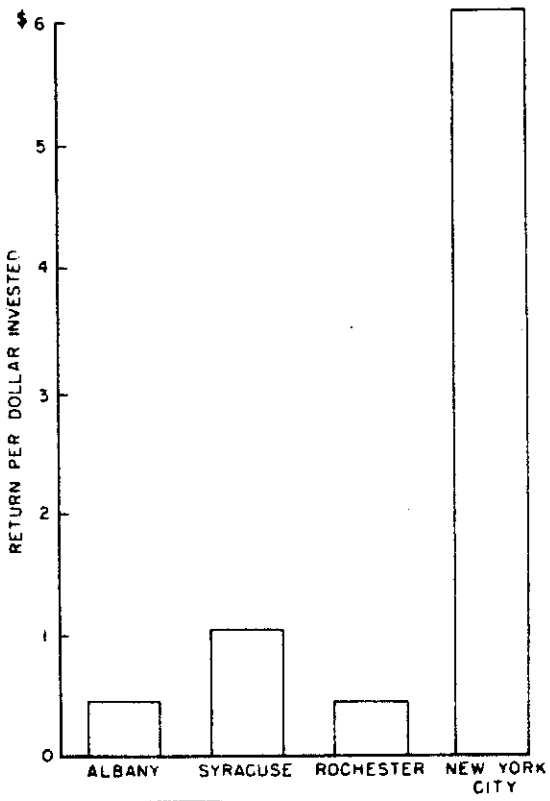
FIGURE 1. SALES RESPONSE DIFFERENCES TO MILK ADVERTISING ACROSS MARKETS



SOURCES: Thompson, S.R., "An Analysis of the Effectiveness of Generic Fluid Milk Advertising Investment in New York State," A.E. Res. 78-17, Cornell University, September 1978. Thompson, S.R., "The Response of Milk Sales to Generic Advertising and Producer Returns in the Rochester, New York Market," A.E. Staff Paper 79-26, Cornell University, June 1979. Kinnucan, H.W. "Demographic vs. Media Advertising Effects on Milk Demand: The Case of the New York City Market," A.E. Staff Paper 82-5, Cornell University, March 1982.

The next question we sought to answer in our research was: Is generic advertising of milk a profitable activity for dairy farmers to be involved in? The fact that advertising increases sales is not, in and of itself, a sufficient reason to engage in the activity: the sales increase must be large enough so that it compensates for the cost of the investment. The results of our research to date on this question indicates that nonbrand media advertising of fluid milk is profitable, but there are tremendous intermarket differences in the rate of return producers realize from their media advertising investment. For example, we found that over the period 1972 - 1979 producers realized an annual average net return of $6 for each dollar invested in New York City (Figure 2). By comparison, our studies show that the same dollar yielded a net return of one dollar in the Syracuse market and net returns from advertising milk in the Albany and Syracuse markets was only about one-half of the return realized in the Syracuse market.

FIGURE 2. INTERMARKET DIFFERENCES IN PRODUCER RETURNS FROM MILK ADVERTISING

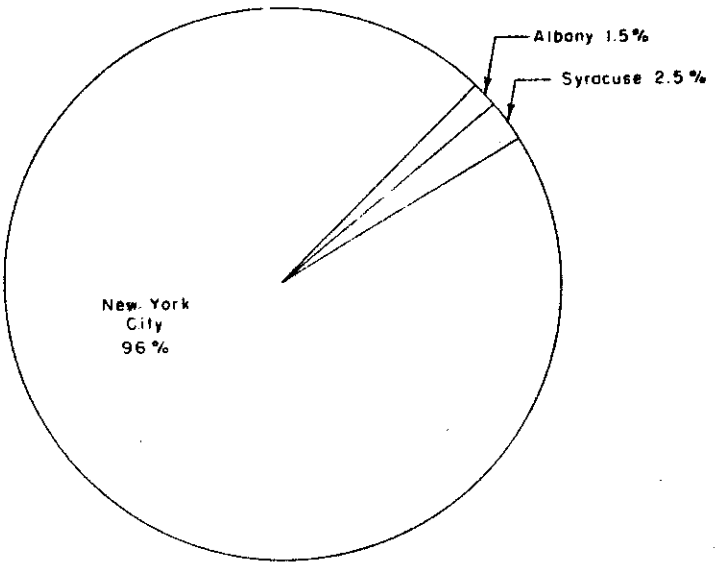


SOURCE: Thompson, S.R., "An Analysis of the Effectiveness of Generic Fluid Milk Advertising Investment in New York State," A.E. Res. 78-17, Cornell University, September 1978. Thompson, S.R., "The Response of Milk Sales to Generic Advertising and Producer Returns in the Rochester, New York Market," A.E. Staff Paper 79-26, Cornell University, June 1979. Kinnucan, H.W. "Demographic vs. Media Advertising Effects on Milk Demand: The Case of the New York City Market," A.E. Staff Paper 82-5, Cornell University, March 1982.

Knowledge of these intermarket differences in the profitability of advertising milk allows managers of milk promotional funds to allocate scarce promotional dollars more effectively. For example, to maximize producer returns from the advertising investment we have recommended that 96% of the annual media advertising budget be placed in New York City, 1.5% in Albany, and 2.5% in Syracuse (Figure 3).

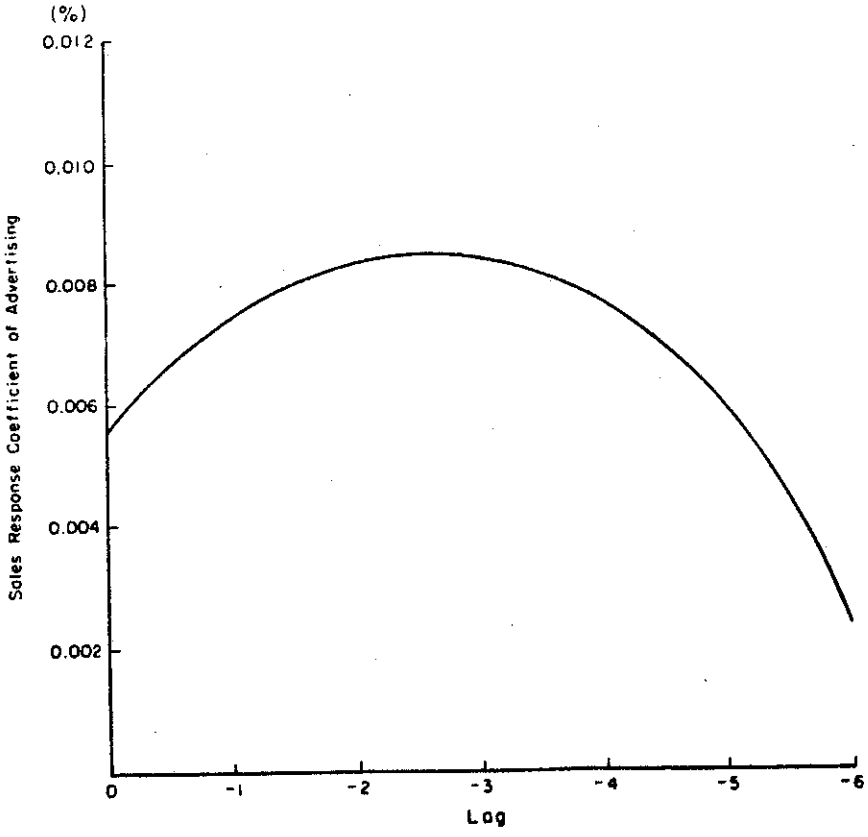
In addition to acquiring information about sales response levels and profitability levels associated with nonbrand media advertising of fluid milk, we have also learned more about other issues relating to advertising that are of some importance. For example, our studies suggest that milk advertising has carryover effects. In particular, our studies show the effect of advertising milk extending two to six months beyond the initial period of expenditure (Figure 4). Furthermore, the initial effect of a milk advertisement is usually found to be small relative to the total effect. This means that the maximum effect of advertising on milk sales may be delayed by one to four months. Understanding the nature of milk advertising carryover effects improves our ability to accurately measure the effect of advertising on sales. We can also use this information to improve decisions regarding the best timing of milk advertising expenditures and I will say more on this topic in a minute.

FIGURE 3. OPTIMAL GEOGRAPHIC ALLOCATION OF GENERIC ADVERTISING BUDGET FOR FLUID MILK, Three New York Markets, July 1976 - June 1977



SOURCE: Thompson, S.R., "An Analysis of the Effectiveness of Generic Fluid Milk Advertising Investment in New York State," A.E. Res. 78-17, Cornell University, September 1978.

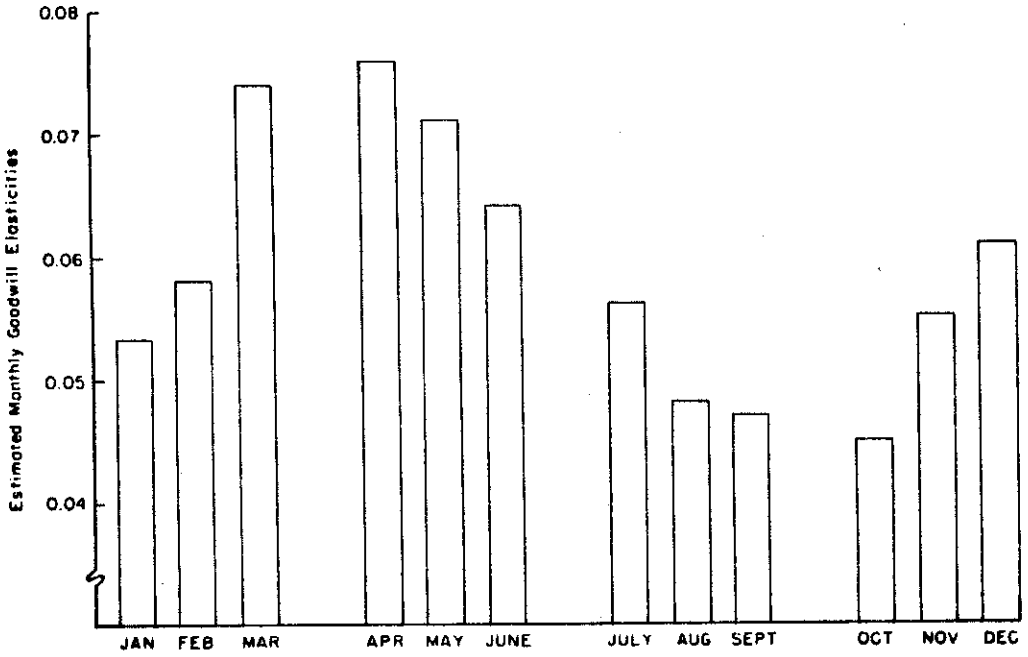
FIGURE 4. SALES RESPONSE PATTERN FOR GENERIC ADVERTISEMENT OF FLUID MILK, New York City



SOURCE: Kinnucan, H.W. "Demographic vs. Media Advertising Effects on Milk Demand: The Case of the New York City Market," A.E. Staff Paper 82-5, Cornell University, March 1982.

Our research also suggests that milk advertising is more effective in some seasons than others. A study of the January 1971 - June 1980 nonbrand milk advertising campaign conducted in New York City revealed a seasonal pattern in sales response to advertising that mimics, with a lag of a month or two, the seasonal demand pattern for milk. In particular, advertising milk appears to elicit the largest sales response in the months of March, April and May and the smallest sales response during the months of August, September and October with the sales response in the intervening months rising and declining in a regular manner (Figure 5). In New York City per capita milk sales are usually greatest during the Spring months and smallest during the summer months. Thus, it seems that advertising milk is more effective when consumers are more interested in drinking milk and less effective in seasons when consumers' interest in the beverage declines.

FIGURE 5. SEASONALITY OF CONSUMER RESPONSE TO MILK ADVERTISING, New York City Metropolitan Area

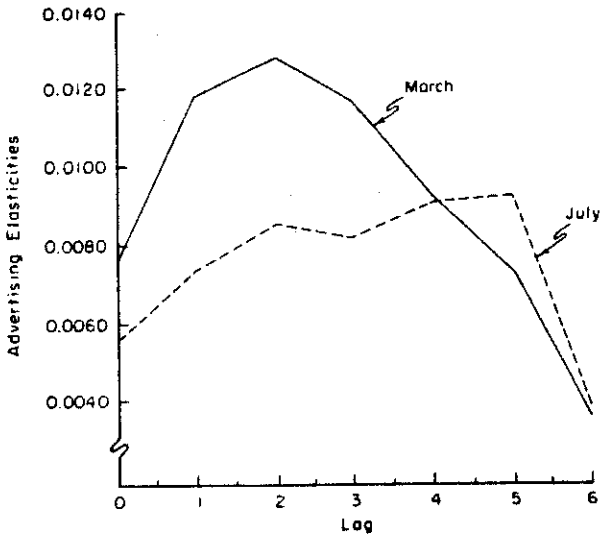


SOURCE: Kinnucan, H.W. and O.D. Forker, "Seasonality in the Consumer Response to Milk Advertising: Implications for Milk Promotion Policy," A.E. Res. 82-29, Cornell University, September 1982.

An interesting aspect of this seasonally varying response rate to milk advertising is the implied underlying differences in the pattern of the carryover effects. We find that a milk advertisement placed in March - a month of relatively high milk consumption - has a greater initial, peak and total effect on sales than does an advertisement placed in July - a month of relatively low milk sales (Figure 6). In addition, the peak effect occurs much quicker for the March advertisement (two months after the original expenditure) than it does for the July advertisement (five months later). This suggests that the mechanism responsible for carryover effects is interacting with the mechanism responsible for seasonally varying response rates to milk advertising. I suspect that some

interesting theoretical work could be done in this area that would assist us in understanding these complex phenomena of seasonally varying preferences for food and advertising lag structures.

FIGURE 6. ADVERTISING LAG STRUCTURES FOR MILK ADVERTISEMENTS PLACED IN MARCH VS. JULY, New York City Metropolitan Area

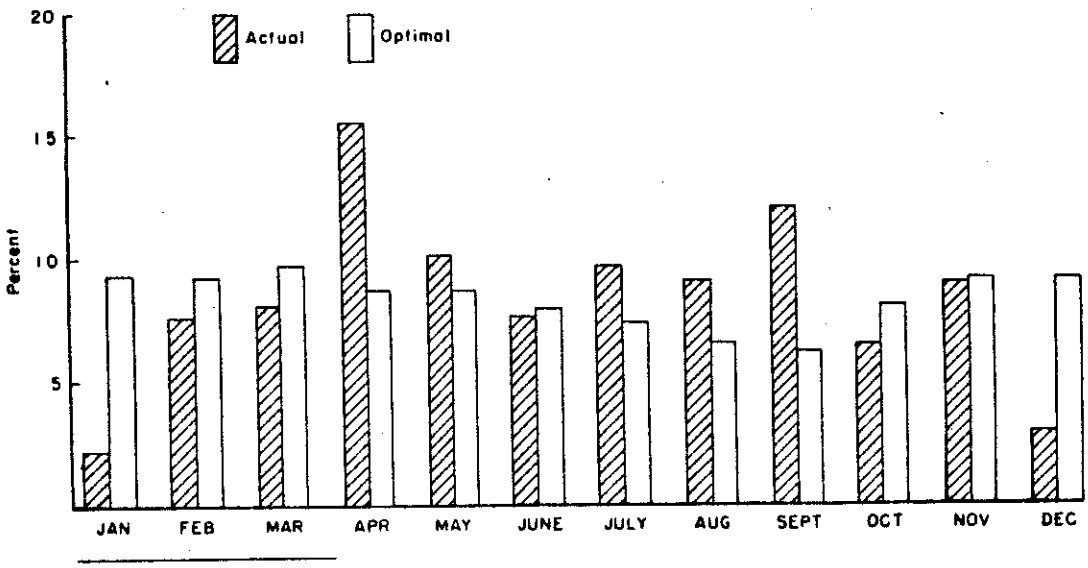


SOURCE: Kinnucan, H.W. and O.D. Forker, "Seasonality in the Consumer Response to Milk Advertising: Implications for Milk Promotion Policy," A.E. Res. 82-29, Cornell University, September 1982.

Seasonal variation in the ability of milk advertising to influence sales means that the milk advertising investment can be made more effective by the appropriate timing of advertising expenditures (Figure 7). For example, it was found that if milk advertising expenditures in New York City over the period January 1978 - June 1980 had been allocated throughout the year to take advantage of seasonal shifts in advertising effectiveness, per capita milk sales would have been increased by an estimated 0.78 percent. Corresponding benefits to producers would have increased an estimated nine percent ($4.1 million) over this eight and one-half year period.

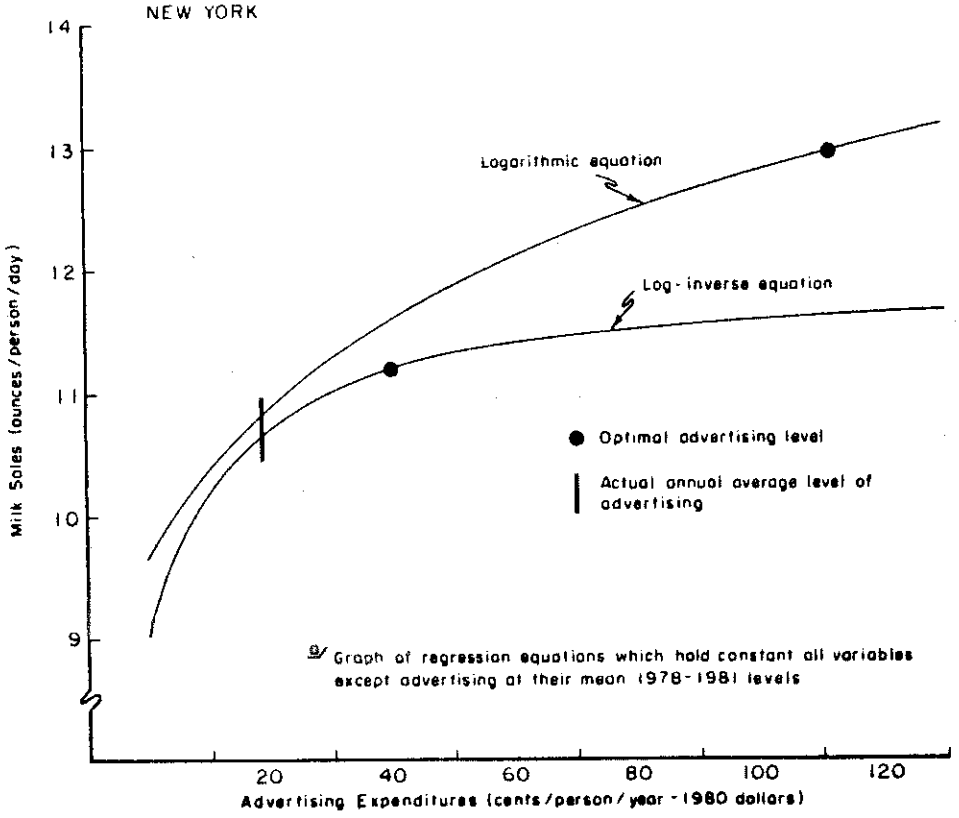
Our research also suggests that milk advertising is subject to fairly rapidly diminishing marginal returns. This means that beyond some point as the level of advertising increases the incremental effect on sales becomes smaller and smaller. For example, results from the Buffalo study show that when a log-inverse equation is used to measure the sales response to advertising an increase in per capita advertising from 20¢ to 40¢ increases milk sales 7.8% (from 10.2 oz/person/day to 11.0 oz/person/day) (Figure 8). By comparison, when advertising is doubled again, from 40¢ to 80¢ the resulting sales increase is only 4.5% (from 11.0 oz/person/day to 11.5 oz/ person/day). In other words, sales do not increase proportionally to advertising. What this means is that advertising levels must be carefully monitored to avoid wastefully high spending levels.

FIGURE 7. ACTUAL VERSUS OPTIMAL MONTHLY ALLOCATION OF ANNUAL GENERIC ADVERTISING BUDGET FOR FLUID MILK, New York City, 1979



SOURCE: Kinnucan, H.W. and O.D. Forker, "Seasonality in the Consumer Response to Milk Advertising: Implications for Milk Promotion Policy," A.E. Res. 82-29, Cornell University, September 1982.

FIGURE 8. MILK SALES - ADVERTISING RESPONSE SURFACES[a/] GENERATED BY ALTERNATIVE FUNCTIONAL FORMS OF THE ADVERTISING RESPONSE FUNCTION, BUFFALO, NEW YORK

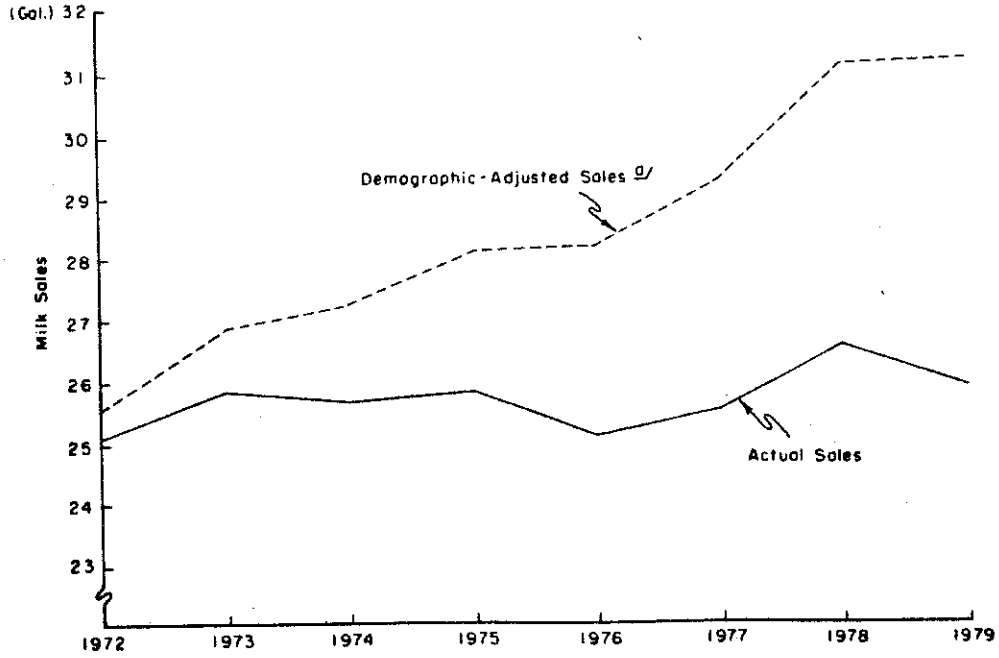


[a/] Graph of regression equations which hold constant all variables except advertising at their mean 1978-1981 levels

SOURCE: Kinnucan, H.W., "Media Advertising Effects on Milk Demand: The Case of the Buffalo, New York Market," A.E. Res. 83-13, Cornell University, February 1983.

A final and very important point I would like to discuss relative to our research on milk advertising has to do with the danger of superficial analysis. In the evaluation of advertising efforts it is tempting to simply look at raw sales figures and, depending on whether sales have increased or remained steady, decide whether advertising has had an effect. This approach can be dangerously misleading because sales, at any point in time, are generally responding to a complex array of forces unrelated to advertising. To ascribe a movement in sales, under these circumstances, solely to advertising is unwarranted. What is required is an approach that isolates the influence of advertising on sales. Unfortunately this generally means the use of fairly complicated statistical procedures. But this is the only way in which meaningful results are possible. Let me illustrate with an example. Between 1972 and 1979 dairy producers invested over $12 million in a media advertising campaign for fluid milk in New York City. Yet, per capita milk sales in this market remained virtually unchanged over this eight year period. Does this mean that the advertising program was unsuccessful? Not at all. An indepth analysis using appropriate tools of analysis revealed that other factors, primarily demographical change, were obscuring the effect of advertising. In particular, the nonwhite proportion of the population in New York City increased 20% and the less than age 20 population decreased 13% over the study period. When the effects of these demographic changes are removed, the study showed the advertising campaign in New York City increasing per capita milk sales by 10% on average each year over what would have been realized had no advertising occurred. In fact, the analysis showed that if demographic changes had not occurred, per capita milk sales would have increased steadily over the period (Figure 9). Thus an effective advertising campaign can be consistent with a flat or even declining trend in sales.

FIGURE 9. DEMOGRAPHIC-ADJUSTED VERSUS THE ACTUAL TREND IN PER CAPITA MILK SALES, New York City Metropolitan Area, 1972-1979



a/ Holding age and race factors constant at January, 1972 levels

SOURCE: Kinnucan, H.W. "Demographic vs. Media Advertising Effects on Milk Demand: The Case of the New York City Market," A.E. Staff Paper 82-5, Cornell University, March 1982.

By the same token, an increasing sales trend does not necessarily mean a successful advertising campaign. During the decade of the 70s, per capita cheese consumption in the U.S. increased on average 6% per year. It would be fantastic to ascribe all this increase to advertising.

In conclusion, generic advertising can sell milk and it can be a very profitable investment for dairy producers. Our research suggests that there are substantial intermarket differences in the ability of advertising to influence sales, that seasonal difference in the size of the consumer response to milk advertising may exist, and that the media advertising investment is subject to diminishing marginal returns. Incorporating this knowledge into decisions on how best to allocate scarce promotional dollars helps insure that dairymen receive the maximum possible returns from their advertising investment.

THE ECONOMICS OF ADVERTISING MANUFACTURED DAIRY PRODUCTS

Henry W. Kinnucan

In looking at the economics of advertising manufactured dairy products the question quickly becomes "will such advertising increase the price the producer receives for his milk?" Because of the dairy price support program the answer to this question is not at all obvious. To see why, let's consider what happens when manufactured dairy products are advertised under a surplus situation.

In the short run dairy farmers would receive no direct benefits from the advertising of manufactured dairy products. This is so because effective advertising would simply replace government purchases with commercial purchases. Total quantity demand would remain unchanged and therefore prices would not change. Without a price increase producers realize no benefits.

In the long run manufactured product advertising may benefit producers, but in a surplus situation this depends on the extent to which the resulting increased commercial demand reduces pressure to lower support prices. Another factor to consider is whether the savings realized by a potentially smaller cut in support price is sufficient to offset the cost of the advertising campaign. If not, then the advertising is not a profitable enterprise. Even if the advertising campaign was deemed profitable, this would not be cause, in and of itself to support the concept of advertising manufactured products. What must be determined first is whether the savings from the potentially smaller cut in support prices, net of advertising costs, exceed the benefits that would have been realized from spending the money on fluid milk advertising.

To answer this last question we need to know the relative effectiveness of fluid milk versus manufactured product advertising. Because milk sold for fluid use is more valuable to the producer than milk used in the manufactured dairy products, a minimum condition for manufactured dairy product advertising to make sense (from the producer standpoint) is that a dollar spent in manufactured product advertising elicit a greater sales response than the same dollar spent on fluid milk advertising. In other words, the sales increase obtained from advertising the manufactured product must be large enough not only to cover the cost of the advertising campaign but also to compensate for the loss of fluid sales that would occur as a result of diverting money from fluid milk advertising to manufactured product advertising.

How large a response can we expect from nonbrand advertisement of dairy products? The evidence relating to this question is scant but does provide some clues. A USDA study conducted in eight markets throughout the U.S. in the early 70s found that a 6¢ per capita expenditure on generic media advertisement of cheese increased sales 18.1% over baseline sales at a 3¢ per capita level (Figure 1). The same study found butter sales rising 4.3%, compared to baseline sales, when butter advertising was conducted at a 9¢ per capita level. These sales increases, especially that of cheese, are quite large relative to that

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found for the generic advertisement of milk in an earlier USDA study. This 1963-65 study conducted in five Federal Order and one State Order market found fluid milk sales rising 4.5% over baseline sales when advertising was increased to 15¢ per capita and rising to 5.9% relative to baseline sales with a 30¢ per capita investment. Thus, it appears that substantially higher levels of investment are necessary to achieve a given increase in fluid sales vis-a-vis manufactured dairy product sales.

FIGURE 1. RESULTS OF A USDA STUDY ON THE EFFECTIVENESS OF NONBRAND MEDIA ADVERTISING OF CHEESE AND BUTTER

Product	Advertising Level	Sales Response
	(¢ per capita)	(percent)
Cheese	3.0	1.2
	6.0	18.1
	9.0	15.5
Butter	3.0	0.0
	6.0	-4.4
	9.0	4.3

SOURCE: Henderson, P.L. "Butter and Cheese: Sales Changes Associated With Three Levels of Promotion," USDA-ERS, Agr. Econ. Report No. 322, January 1976.

Additional information on the relative effectiveness of advertising manufactured dairy products comes from a Cornell study of yogurt advertising in California. This 1979 study looked at both generic and branded advertising effects on yogurt sales. It found that each 1¢ per capita increase in generic advertising increases yogurt sales by 0.5 oz./person whereas when branded advertising increases by 1¢ per capita sales increase 1.3 oz./person (Figure 2).

FIGURE 2. RESULTS OF A CORNELL STUDY ON THE EFFECTIVENESS OF GENERIC VS. BRANDED ADVERTISEMENT OF YOGURT, 1979

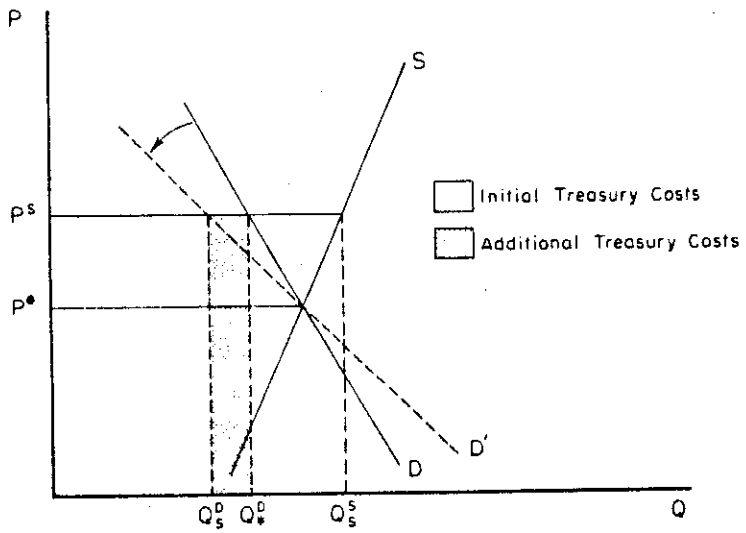
Type of Advertising	Sales Response to a 1¢ Per Capita Increase In Advertising	Carryover Effects	Percentage of Total Sales Attributable to Advertising
Generic	0.5 oz./person	5 months	2%
Branded	1.3 oz./person	7 months	17%

SOURCE: Hall, L.L. and I.M. Foik, "The Effectiveness of Generic vs. Brand Advertising for Manufactured Milk Products - The Case of Yogurt," A.E. Staff Paper 82-4, Cornell University, April 1982.

In addition, the study suggested that 17% of the total volume of yogurt sales was attributable to branded advertising and 2% of the volume to generic advertising. This study further supports the notion that advertising can significantly influence the sales of manufactured dairy products. To the extent that this is true, it provides some prima facie economic justification for advertising these products.

A more subtle point bearing on the decision to allocate promotional dollars to the advertisement of manufactured dairy products is its potential effects on price support program costs. The logic of a simple static supply and demand curve analysis of dairy price support program cost dictates that as the demand for farm milk becomes more elastic treasury costs rise (Figure 3). There is good reason to believe that shifting the emphasis from fluid milk advertising to manufactured product advertising will, over time, make the farm level demand more elastic. In particular, most empirical studies show the demand for cheese, butter, ice cream, etc. as being much more elastic than the demand for fluid milk. As manufactured product advertising increases the Class II utilization rate, these more elastic demands will be felt more prominently at the farm level, placing an added pressure on price support program costs as indicated by Figure 3.

FIGURE 3. POTENTIAL EFFECT OF AN INCREASED CLASS 2 UTILIZATION RATE ON DAIRY PRICE SUPPORT PROGRAM COSTS



In conclusion, a number of questions must be answered before we can say conclusively whether dairymen gain from investing in manufactured product advertising. These are: 1) Will the price received by the producer rise as a result of the advertising effort? 2) If the price does rise (or if the advertising leads to a smaller cut in the support price, is the advertising-induced price rise sufficient to compensate for the costs of the advertising program? 3) Would producer prices have risen even more if those same dollars had been spent on the promotion of fluid milk rather than on the promotion of manufactured products?

All this is not to say that we should not invest in manufactured product advertising. Rather we should use that experience to begin to shed more light on some of the questions raised above.

SOME FINAL THOUGHTS ON INCREASING MILK AND MILK PRODUCT CONSUMPTION: ISSUES FOR THE 80s

Andrew M. Novakovic

During the course of this conference we have discussed a broad range of topics related to the consumption of dairy products:

-- economic factors affecting consumption.

-- demographics, nutrition, quality, and other such factors affecting consumption.

-- products that compete with milk or dairy products for the consumers dollar.

-- the relationship between existing or possible new regulations that do or may affect consumption.

-- the potential for increasing sales of dairy products through promotion, marketing innovations, product development and the like.

As one would expect we have heard some pros and cons regarding the various topics, and we have heard good news and bad news. For example:

-- imitation cheese products (or other imitation dairy products) are here to stay but perhaps their sales potential is limited, and perhaps they would become even more limited if prices of manufactured dairy products were not held to such artificially high levels under the dairy price support program.

-- for nutritional or price reasons, sales of some dairy products will likely continue to decrease or at least will be hard to increase, but other existing or new products offer considerable hope for continued or expanded growth.

-- increasing the required level of nonfat solids in fluid milk products may increase the total use of nonfat solids and have benefits in relation to dairy price support purchases, but the longer run potential for enhancing sales of fluid milk seems questionable, and I would add the question, do we really want to try to increase the use of nonfat solids by regulation?

-- promotion seems to work, especially in the short run, but some still have doubts about its long-run effectiveness. There are also many questions about what products to promote, how to promote them, and who should bear the cost of promotion.

-- milk quality, or the lack of it, is important, but identifying or creating economic or other incentives to enhance quality and other less tangible or visible characteristics of milk can be frustrating

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-- the dairy industry is awakening to the need for greater product variety and new products, but it is doing so very slowly.

Perhaps the theme for this conference was best expressed by Professor Zall when he encouraged us to redirect our efforts from regulating milk to marketing milk. As I recall a similar comment was made at the Midwest Milk Marketing Conference last week--"let's concentrate on marketing milk not pricing milk". I believe what these speakers are telling us is, "let's get on the offense and get off of the defense." Many of us have focused our efforts on protecting dairy farmer programs instead of taking the initiative to reduce the need for protection. We need a more positive approach. We often lament our industry's problems, but what of its great strengths and virtues. I am not the first to point out what a wonderful product we have to sell. How is it that others can sell products that are far less healthful and wholesome? We also have a good marketing system, and we have a regulatory superstructure that can be helpful when it is not abused.

This does not mean that it's easy. It is anything but easy. It is hard, hard work; it takes initiative and imagination. It means taking risks. It does not mean instant riches. In fact the long run gains may be good but are probably not spectacular. But, what is the alternative? An increasingly welfare oriented dairy sector - one that tries more and more to maintain income or net returns through government programs? I hope that is not our choice.

Programs that provide stability to inherently unstable markets and that provide reasonable rules of trade to an industry that has not conformed well to the model of perfect competition are good, but they should be in the background not the foreground. They should be as unobtrusive as possible. They should not dominate our thoughts for months on end.

It would be far better for the dairy industry to focus on striving to continually increasing production and marketing efficiency and on developing new markets and new products. We know the potential exists to increase market efficiency--to reduce transportation costs and to increase plant efficiency. We know that many new products or production technologies are within our grasp or are just a short reach away. We know that we have not stretched our creative abilities to develop or improve markets for dairy products.

Is promotion the answer? Is product development the answer? Are improvements in the marketing system or marketing strategies the answer? Perhaps we need to first ask "what is the question?" If the question is how can I protect myself from the vagaries of the marketplace or how can Uncle Sam bail me out, then there are other answers. But if the question is how do we survive in a competitive marketing system--how can I survive through my own initiative?--then I think we should look to these kinds of answers.