TECHNICAL CONSIDERATIONS IN EVALUATING FLUID MILK SALES

A Report to
Market Research and Economics Division
AMERICAN DAIRY ASSOCIATION
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Texas Agricultural Market Research
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Texas A&M University
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THE TEXAS AGRICULTURAL MARKET RESEARCH AND DEVELOPMENT CENTER

An Education and Research Service
of the
Texas Agricultural Experiment Station
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The purpose of the Center is to be of service to agricultural producers, groups and organizations, as well as processing and marketing firms in the solution of present and emerging market problems. Emphasis is given to research and educational activities designed to improve and expand the markets for food and fiber products related to Texas agriculture.

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Randall Stelly, Ph.D.
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TECHNICAL CONSIDERATIONS IN EVALUATING FLUID MILK SALES

Robert Branson, John Nichols, and Randall Stelly*

STATEMENT OF THE PROBLEM

The rate of consumer product diversification and proliferation advanced substantially during the decade of the 1960's. A continuation of the same appears in store for the 1970's. Concommitant has been an intensification of competition for the consumer's dollar. Food marketing, as a sector of the whole, was fully enveloped. And within that, the beverage market has been particularly active. As competition intensified, acceleration occurred in the formulation and application of market development techniques and strategies.

Along with the foregoing has come more concern as to the effectiveness of alternative market strategy decisions. Concern evolved from several sources. Among others, the number of available market development alternatives, through increased knowledge, expanded and rational reasons for choices consequently were sought. Moreover, costs of all the forms were sufficiently large to make them a significant management decision in capital allocation.

The American Dairy Association, as a milk producer industry organization has been caught up in the throes of the aforementioned developments. Fluid milk at retail encountered much wider competition in recent years than ever

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* Respectively, Professor, Assistant Professor, and Associate Professor, Department of Agricultural Economics and Rural Sociology.

before. Per capita fluid milk consumer sales have declined and, of necessity, the dairy producers and handlers are becoming more market conscious.

The American Dairy Association has developed one of the leading market development programs in U.S. agriculture. Controlled research experiments have indicated that fluid milk sales are responsive to market promotion activity.[1/] However, as researchers knowledgeable in market development recognize, it is not feasible, cost-wise, nor even desirable, pragmatically, to conduct each market promotion endeavor under a controlled experiment condition. Rather it would be preferable to subject the promotional programs to periodic research checks to verify the size and type of responses received. Such a policy could provide essential program quidance information.

Adoption of the above policy, however, does not negate concern among those in a given promotion market regarding results achieved. Therefore, an unavoidable interest prevails in monitoring results of market development efforts.

Marketing efforts do not occur in a ceteris paribus environment. Rather, a multitude of factors bear upon the final outcome. Consequently, the American Dairy Association has supported this effort to formulate a systematic check list of market factors that should be monitored for a reasonable period before, as well as during, a market development campaign. This report is a reflection of that effort.

1/ Wendell E. Clement, et. al., "The Effect of Different Levels of Promotional Expenditures on Sales of Fluid Milk," Marketing Economics Division, Economic Research Service, U.S.D.A., Washington, D. C.

DELINEATION OF THE RESEARCH OBJECTIVE

The interest here is to systematically identify, from a research standpoint, the more significant marketing factors that may influence fluid milk sales and to provide evaluative guidance as to alternative measurement methods for each. Such market factors, during a milk promotion program, may either remain entirely neutral, stimulate sales, or decrease them. Most, needless to say, will be recognized as operative at all times, not just in a promotion program.

No intent prevails here to determine the mathematical coefficients of influence upon fluid milk sales for each of the market factors. Such would require a separate research effort and, furthermore, coefficients may vary from one market to another.

In preparing a factor list, convenience, as well as theory, suggests a possible division of the market influences into two categories -- exogenous and endogenous. The exogenous factors, by definition, are independent of the milk industry's control -- what sometimes simply are called "outside" factors. The endogenous or "inside" ones may be controlled by the industry itself, if it so chooses. Development of additional further classifications is employed to facilitate the presentation.

THE RESEARCH APPROACH

Following meetings between the staff of the Texas Agricultural Market Research and Development Center and representatives of the American Dairy Association, a task force of the Center assumed the responsibility of developing an initial, preliminary list of factors affecting fluid milk sales. At such meetings, a decision also was reached as to the cities from which industry information would be sought concerning any additional factors affecting milk sales. Cities agreed upon were Albuquerque, New Mexico; Austin, Texas; Minneapolis-St. Paul, Minnesota; and Rochester, New York.

The above cities represent a diverse mix of markets from a geographic and internal market composition standpoint. Albuquerque was selected because milk substitutes were introduced and promoted there in recent years. It also is influenced by nearby military bases. Austin, by comparison, is heavily affected by the presence of the University of Texas, a large state university, is a state capitol where market fluctuations arise from biennial meetings of a state legislature, and is the location of a military air base. Rochester was included because it is a market for which there is extensive data on milk movement. Minneapolis-St. Paul was chosen to typify the Midwest dairyland.

In each market the research procedure was to hold semi-structured interviews with responsible executive representatives of the dairy processors, and/or distributors; food chains; major advertising media; local, state, and federal agencies including food distribution agencies; military base personnel; and any other market segments felt to be of significance.

Purpose of the interviews was essentially two-fold. One was the further identification and/or confirmation as to those factors affecting fluid milk sales. The other was a determination of reliable sources from which factor measurement data could be obtained.

Interviewing was by members of the professional staff of the Research Center. Most were face-to-face, personal interviews, although where necessary for the convenience of the interviewee, or other special circumstances, telephone interviews were used while in the local market concerned.

In considering influences affecting fluid milk sales, it was also essential to bear in mind the possible forms in which each might be employed in a sales analysis model. A brief consideration of relevant analytical model constraints is therefore advisable.

SALES MANAGEMENT MODELS AND DATA REQUIREMENTS INTERACTION

Advertising, be it single effort or campaign, initiates a sequence of events culminating, if successful, in added product purchases by consumers. Consideration of the sequence is discussed at length in the literature.[2/] It begins with consumer exposure to the advertising message, moves through successive awareness stages, attitude alternation, a purchase decision, and finally actual purchase of the product.

Such a sequence suggests that effectiveness of the advertising could be evaluated at anyone of these succeeding levels in the consumer response hierarchy. Although criteria of effectiveness can be derived at each response level, the major limitation is that some assumptions must be made regarding the relationship between success at the level measured and ultimate success in terms of increased sales. For example, an advertisement may be evaluated in terms of its ability to create product awareness among consumers. Surveys and questioning techniques may be used to determine the proportion of consumers who can recall a specific advertisement. A choice can be made between alternative advertisements on the basis of consumer awareness recall ratings. The assumption must be made, however, that a high correlation exists between ad recall and the relative effect on sales. Correspondingly, measurements at other pre-purchase levels involve similar assumptions as to final purchase effects. It should be noted that many criteria at other levels of the hierarchy (audience exposure, recall, attitude change, etc.) are regularly used for evaluating copy material,

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2/ For example see Robert J. Lavidge and Gary A. Steiner, "A Model for Predictive Measurements of Advertising Effectiveness, "Journal of Marketing, Vol. 25, No. 6, October, 1961, pp. 59-62; or John A Howard and Jogdish N. Sheth. The Theory of Buyer Behavior, John Wiley and Sons, Inc., New York. 1969, p. 335.

themes and ideas, or for selecting media at earlier stages of advertising development. But these are generally used for selecting from among several alternatives and not for determining the returns from an advertising expenditure.

While some research has investigated the relationship between sales and various pre-purchase criteria, many researchers prefer to avoid these problems and use sales as the ultimate criteria to evaluate advertising effectiveness. The sales level is considered the "acid test" of advertising effectiveness.

Acceptance of sales changes as the criterion of advertising success makes it important to consider the alternative methods of measuring the sales responses. Methods used range from simple cursory examinations of sales trends to highly sophisticated closely controlled experiments. Since the thrust of this report is not model conceptualization reference is made to Henderson's work in this area. Henderson provides a useful classification of alternatives with an excellent discussion of advantages and limitations.[3/] Briefly, he refers to three basic methods: the use of subdivided time series analysis, the matched cities design, and the controlled rotational experiment approach.

Henderson points out the importance of either controlling the influence of independent variables, other than advertising for the test product, or providing a means of correcting for their influence, otherwise an accurate estimate of the advertising impact on sales cannot be obtained. He concludes that highly controlled experiments are necessary to provide an adequate evaluation of advertising. Recognized is the fact that such methods are generally expensive as well as difficult to apply.

3/ Peter L. Henderson, "Research Methods for Measuring Sales Response to Advertising," Proceedings of the Annual Meeting of the American Dairy Association, March 25, 1970.

An ex-post decision to analyze a promotion program presents a virtually impossible task. Once the analytical model is selected, one usually finds that highly essential data were not properly recorded, if at all, and the analysis dies of data starvation. Thus a decision to evaluate a sales promotion program must be reached as part of the advanced planning. Once the analytical model is selected, data requirements are stipulated for factors included, and definitive data measurement procedures are established.

Whether a version of the segmented time series, matched cities method, or controlled rotational experiment is used, usually weekly or monthly figures, on a wide range of variables, comprise the potential raw data input into the analysis. A systematic information system must be established for each so that those evidencing activity (dynamic changes over the test period) can be screened and tested for associative relationship to the market test sales levels achieved. Consideration must also be given to the time segments, weekly or monthly, for which data on the various endogenous and exogenous variables is available. This will influence the time period design of the promotion test and may cause a shift to an entirely different analytical model. Thus attention to the list of potentially dynamic variables, and their time base of calculation, is highly essential to the entire research planning process. Special measures frequently are required to establish shorter period readings of several variables than are provided by secondary data sources. For example employment and payroll data may be available quarterly, yet for promotion test purposes are needed weekly or monthly. In that event a special reporting system may be required with local employment offices -- governmental and private.

The following rather detailed discussion of market analysis variables and their respective sources, is, in considerable part, based upon the four-market investigation. The presentation is designed to aid the market researcher in both the conceptual and operational design of market promotion measurement.

CLASSIFICATION OF MAJOR GROUPS OF VARIABLES

A number of classification systems can be employed for categorizing market factors affecting fluid milk sales. The following division appears to be sufficiently discriminatory, as well as in keeping with the externalities of sources from whence the respective market influences are generated.

Endogenous factors

1. Marketing activities for milk.
2. Packaging and retail availability of milk.
3. Public image of milk.
4. Changes in milk supply and movement.

Exogenous factors

5. Marketing activities for competing beverages.
6. Government programs and activities.
7. Economic, social factors, and other market conditions.
8. Factors affecting consumer shopping habits and mobility.
9. Size of the market.

One may differ with the assignment of the factors between the endogenous and exogenous classifications. Few are completely one or the other, so the division has to be based on the preponderant, rather than exclusive, influence source.

In the immediately following section a convenient table summary is set forth of the foregoing categories with subdivisions noted within each. An overview comment only on each is in order at this juncture.

Marketing Activities for Milk

The subject category comprises all of the media advertising, point-of-sale displays, demonstrations, contests, couponing and related activities by a) milk handlers, b) industry groups such as the American Dairy Association, or c) retailers in marketing fluid milk. The full gamut of television, radio, newspaper, magazine and mail-outs is involved plus the wide range of in-store and delivery route promotions that can be formulated.

Price policies and strategies of processors, handlers, and retailers are within category one. Added are those policies regarding milk quality and product diversification and differentiation at the consumer market level.

All of the foregoing marketing components vary somewhat from market to market. They also vary over time within any given market. Failure to consider these in a market promotion analysis would, of course, be grossly negligent.

Packaging and Retail Availability of Milk

The dairy industry, until recently, was caught in a generally static state insofar as types of retail fluid milk containers is concerned. Movement from the quart to the addition of half-gallon and gallon size cartons or bottles was the basic change. The advent of plastic containers with self handles formed a new consumer convenience dimension to milk packaging which at least partially broke the conventionalism.

Several aspects of packaging are important to market impact. The customer convenience has already been mentioned. The display impact of package design cannot be overlooked inasmuch as impulse buying is a

considerable factor in food shopping. Display size is also affected, in part, by the variety and sizes of containers.

Public Image of Milk

Image concepts of products, among consumers with discretionary income, have become extremely important. Formidable as images are, they represent a marketing dimension most agricultural economists have ignored or else circumvented in a research sense. Creation of a favorable product image is essentially the responsibility of the item's producers or marketers. This obligation is duly recognized by the American Dairy Association and is reflected in its program. Efforts, however, may be reinforced or submarined by information flowing from outside sources. Consequently, designation of this area as an endogenous set of variables is more suspect than the others.

Home economists, physicians, food editors, research scientists, nutritionists, food fadists, counter claims for competing beverages all shape the totality of the consumer imagery of milk. Research methodology in this phase of marketing is expanding and in some market promotion analyses particular attention is required to product concept measurement. Even pricing and packaging, rightly or wrongly, influence mental attitudes toward a product.

Changes in Milk Movement

Ability of present transportation methods to deliver fluid milk over long distances adds complexity to knowledge of total milk supplies entering a given market area. Milk movement between market order areas is accelerated

by vertical and horizontal integration within the food distribution industry. Special examination of market flows is required before a thorough market analysis can be attempted.

Accelerating supply variations at times are the residual effects of supply contracts for serving military bases. At times, bootlegging of milk into unauthorized markets occurs. Labor strikes may occur at any one of many levels in the production-distribution system. Although long range effects may be minor, those on a market test can be quite substantial. Here too either, or both, endogenous and exogenous variables may be activated in the course of a market test.

Marketing Activities of Competing Beverages

Perceptive members of the dairy industry now recognize that fluid milk is indeed competing in the total beverage, as well as food field. Impressive market gains by other beverages, obtained by adroit market development strategies, can no longer go unnoticed. All of the decline in fluid milk consumer use is not attributable to negative characteristics pinned on milk in recent years. Equally important have been plus characteristics built into consumer images of competing products.

Formidable market promotion programs representing both offensive and counter action are launched by beverage makers who by the very nature of their products are in contraposition to milk. The gamut of activities for these competitive beverages generally exceeds those available to fluid milk, since the latter suffers from an environmental handicap of having to be

constantly refrigerated. Should a researcher not be fully cognizant of promotional techniques currently in vogue, both at the distributor and consumer levels, it is strongly urged that recent literature on general marketing, market development, and market research be reviewed.

Governmental Programs and Activities

Concern here is with the school lunch, food stamp, direct food distribution special milk program and other governmental activities that involve distribution of fluid milk or powdered milk to school children, welfare households or in emergency relief areas. Such programs have definite interactions on retail purchases. A full inventory of such programs is needed for a market promotion area.

New programs such as the recent Head Start pre-school activity can be established and one must be on the alert for such developments.

Economic, Social and Other Market Factors

It appeared advisable to group the exogenous factors of market population attributes together. Involved are such matters as income, hours worked, living costs, internal changes in age distribution of the population, ethnic group distributions, and away from home eating patterns. Other facets under this general heading may be important to a given market. Thorough knowledge of the market is imperative before selecting it for sales evaluation. The time period length for the analysis influences the importance of variables of this type.

Factors Affecting Consumer Shopping Habits and Mobility

Contained in this category are influences on within-the-month shopping patterns arising from changes in days or hours open by food outlets, and effects of changes in merchandising policies such as double-stamp days. The annual calendar, not being directly geared to weeks, imposes shifts in pay days and holidays including forward or delayed buying. Super-imposed on the calendar effects are severe weather conditions which shunt buying time forward or backward. Some types of strikes can directly affect consumer mobility. Unlikely as some of the occurrance may be, the impact can be substantial when it eventuates.

Size of Market

Population is more volatile in most metropolitan markets than one may suppose. Special entertainment events, conventions, colleges or universities, business and vacation travel all impel sizeable shifts in the head count week to week. If there is any inclination to doubt these effects, figures substantiate that major convention cities draw a million or more persons attendance per year for one to five days per individual.

Employment opportunity changes may spur growth or retard it in the short run. The 1960-70 changes among the ten top metropolitan markets within the Northeast, South, Midwest and West regions ranged, for example, from -0.5% to 104.8% according to the Sales Management 1971 Survey of Buying Power.

For convenience, a tabular listing of some of the major market variables and sources of information is presented in the following section. It is to serve as a quick check list but not necessarily as a complete one.

MARKETING ACTIVITIES FOR MILK

Item	Importance
CHANGES IN ADVERTISING	
Handler Sponsored	Annual advertising expenditure of about $30 million by handlers to support dairy products, or about 16 cents per capita.
Industry Sponsored	A.D.A. and others spend about $20 million per year to support dairy product advertising, or about 10 cents per capita.
Retailer Sponsored	Milk, for example, appeared an average of 20 times in a recent month among food store ads in a major paper in two metropolitan markets.
CHANGES IN MERCHANDISING ACTIVITY	
In-Store Displays	Impulse buying affects 1/3 to 2/3 of all food purchases in retail stores. In one supermarket a new dairy product display reportedly increased sales 42% among total dairy products.
Special Promotions	Coupons, double stamp days at retail stores can also cover milk purchases. About 37% of food chains gave trading stamps in 1970.
PRICE CHANGES	A 1% price increase, associated with no other marketing changes usually causes sales to drop 0.3%. Average retail price increased 7% during the last 2 years.
QUALITY OF PRODUCT	In a survey, 58% of samples did not have an acceptable ordor after 10 days and 74% after 14 days. Average keeping quality ranged from 3.3 to 5.7 days. Decreased frequency of pick-up, processing, and distribution are critical factors.

PACKAGING AND RETAIL AVAILABILITY OF MILK

Item	Importance
CONTAINERS - PACKAGING	Changes in package designs can improve convenience of product handling, storage, and use. Competing products have capitalized on this.
AVAILABILITY IN RETAIL OUTLETS	Nearly 2,000 convenience food stores are opened each year which changes milk availability.

For Market Sales Evaluation		Information Required	Information Source
Likely Occurrence	Importance if Occurs		
High	High	$ expenditure in local market area, no. of households reached by the ads.	Nationally based advertising audit services available through advertising agency for local market area. Offices of all media outlets in your local market area; radio, television newspaper and billboard. Offices of milk handlers, industry organizations and retailers sponsoring promotion for milk as appropriate.
High	High	$ expenditure in local market area, no. of households reached by the ads.	
Medium	High	Amount of ad space devoted to milk, retailers share of the area's milk sales.	
Medium	High	No. of stores with special displays.	Offices of milk handlers operating in local market area. Offices of industry groups actively promoting milk in local market area. Office of dairy products merchandisers of retail food chains in the market.
Low	High	No. and kind of special deals offered and market coverage to which applies.	
Low	High	Retail prices of fluid milk; in retail outlets, delivery routes, and eating establishments.	Food chain dairy product merchandisers. Offices of handlers with home delivery routes, independent stores and eating establishments.
Low	Medium	Days lapsed time from milking to final home use.	Offices of public health agencies of city and county. Dairy product, handlers.

For Market Sales Evaluation		Information Required	Information Source
Likely Occurrence	Importance if Occurs		
Low	Medium	Date of change in packaging and number of handlers and stores or homes involved.	Offices of chain store dairy product merchandisers and handlers.
Low	Medium	Changes in number of retail food stores.	Chain store dairy merchandisers, handlers, independent store managers, and operators of restaurants and other eating establishments.

PACKAGING AND RETAIL AVAILABILITY OF MILK

Item	Importance
CHANGES IN HOME DELIVERY	Home delivery routes are declining in number and frequency of delivery. Some people claim that home delivery enhances milk consumption. Proportion of fluid milk sales through home delivery decreased from 30 to 19% during the past 8 years.

PUBLIC IMAGE OF MILK

Item	Importance
FAVORABLE PUBLICITY - GENERAL	Overall consumer attitudes toward fluid milk are constantly being modified by all forms of news and publicity in health, diet, and price issues in all media.
Industry Sponsored	Some of these issues may be discussed favorably and clarified in publicity releases of industry groups. The impact of these releases, if handled properly, can have a positive impact on attitudes.
General News and Releases	Similar positive effects may result from general news articles on the favorable aspects of milk.
NUTRITION EDUCATION PROGRAMS	General attitudes toward milk may also be shaped by programs of home economists and nutrition specialists. In March, 1971, 32,300 Texas homemakers participated in the expanded nutrition program of the Extension Service foods and nutrition specialists - plus all the mass media.
FOOD MODIFICATIONS WITH PUBLICITY	Fortification and other processes for protein, minerals, vitamins, etc. increased the belief that "other foods can provide the nutrients of milk," and, therefore, "milk is less needed."
UNFAVORABLE PUBLICITY	The importance of this factor has been noticed in recent years in the controversy over cholesterol, heart disease, DDT and nuclear fallout.
INDUSTRY SPONSORED EDUCATION AND SUPPORT PROGRAM	Long term attitudes toward milk may be affected by active education programs. Changes in these programs may affect consumption during a promotion program. In March, 1971, 32,300 Texas homemakers participated in the expanded nutrition program of Extension Service food and nutrition specialists - plus all the mass media.
PRICE SETTING PROCEDURES AND PRACTICES	Price wars are claimed to upset the consumer with respect to the fair or proper price for milk, and to lead to a poor image of the milk industry.
NEW OR MODIFIED PRODUCTS WITH PUBLICITY	Sales of skim or low-fat milk increased from 7 to 21% of fluid sales from 1960 to 1970 while whole milk decreased from 88 to 74%. "Milk" may be "more fattening."

For Market Sales Evaluation		Information Required	Information Source
Likely Occurrence	Importance if Occurs		
Low	Medium	Number of routes operated and number of homes included.	Milk handler sales offices.

For Market Sales Evaluation		Information Required	Information Source
Likely Occurrence	Importance if Occurs		
Medium	High	Measure of total publicity and news releases dealing with milk attitude studies.	Market research.
Medium	Moderate	Number of publicity releases appearing in the media in the market.	Review of media coverage.
Medium	High	Number of publicity releases appearing in the media in the market.	Review of media coverage.
Medium	Medium	Measure of extension and nutrition education efforts.	Extension home economists; home economists for utilities.
High	Medium	Number of publicity releases in market media.	Review of media coverage.
Medium	High	Number of publicity releases appearing in the media in the market.	Review of media coverage.
Medium	Medium	Measure of educational effort.	Local dairy council; handlers.
Medium	Moderate	Frequency and extent of price changes.	Handler sales records; market research.
Medium	Medium	Frequency and extent of sales of new or modified product attitude studies.	Survey of retailers and handlers.

CHANGES IN MILK SUPPLY AND MOVEMENT

Item	Importance
CHANGES IN MILK SANITARY REGULATIONS	Can eliminate small distributors and reduce supply area and affect interstate shipments of milk.
UNETHICAL DAIRY PRACTICES	Bootlegging supplies into markets and price wars can disrupt normal sales levels. Handler reported producer milk in Cl. I. increased from 32.4 to 48.8 mil. lb. (51%) from November '67 to November '68 in South Texas markets after Federal order went into effect.
INTER-MARKET MILK MOVEMENT SHIFTS	Bulk hauling increased delivery distance range for fluid milk. Increased possibility of new supplies entering market.
MILITARY BASE CONTRACTS	Made on bid basis and supply source can change with each bid. Milk sales thru Bergstrom Air Force Base in Austin, Texas amount to 190 lb. per capita.
DISRUPTIVE WEATHER CONDITIONS	Floods, blizzards and other impediments to truck transportation of usual milk supplies.
LABOR STRIKES AND LOCKOUTS	For a period of time milk may be available only to hospitals, etc. on an emergency basis. Sales are lost forever.
WITHHOLDING ACTION BY PRODUCERS	Occasional milk dumping campaigns have occurred in recent years.
MILK CONTAINERS	Paper cartons, plastic containers, bag in box containers affect milk movement, availability, and perhaps quality. Other changes can be forthcoming. Consumer convenience, unit packaging, and economy will be principal motivating factors.

MARKETING ACTIVITIES FOR COMPETING BEVERAGES

Item	Importance
CHANGES IN MERCHANDISING ACTIVITY	
In-Store Displays	Recent test of special display increased sales of unadvertised orange drink by about 360%. Special coffee display increased sales 280%.
Special Promotions	Double stamp or bonus stamps can increase sales up to 5 times usual level. 23% of supermarkets make use of multiple stamp days.
Coupons	Close to 17 billion coupons were used in 1969 by food and drink processors in the U.S. in various sales and consumer incentive programs 81% of grocery companies use premiums in consumer promotion.

For Market Sales Evaluation		Information Required	Information Source
Likely Occurrence	Importance if Occurs		
Low	High	Number of milk suppliers affected and change in quantity of milk sold.	Producer cooperatives. Local and state health authority offices.
Low	Medium	Nature of action and supply and price changes.	Office of local milk market administrator. Local handlers in the market.
Low	Medium	Changes in supply sources and volume involved.	Offices of local dairy cooperatives, milk handlers, and retail stores.
Medium	Low	Source of supply for contract deliveries and quantity.	Offices of the Director of Information at military base located in local market area.
Low	Medium	Weather data on number of severe weather condition days.	Records from local weather bureau office. Information from local dairy coops and handlers.
Low	High	Extent and duration of action.	Local dairy coops, handlers, and retail stores.
Low	High	Number of days in effect and quantity of product involved.	Milk order office, office of county extension agent.
High	Medium	Number of new packages, extent of use.	Market research and surveys.

For Market Sales Evaluation		Information Required	Information Source
Likely Occurrence	Importance if Occurs		
High	High	Type and number of special promotions, number of stores and products involved.	Food chain product merchandisers for local market area.
High	Moderate		Survey of sample of retail outlets in the market to obtain data.
High	Moderate	Number of stores using coupons and number or value of coupons.	"Sales Management"

MARKETING ACTIVITIES FOR COMPETING BEVERAGES

Item	Importance
CHANGES IN LEVEL AND AMOUNT OF ADVERTISING	
Product Manufacturers	
Soft Drinks	Spent $97 million in 1969 or 48 cents per capita. Pepsi Cola increased – Coca Cola increased.
Coffee	Outlay of $58 million in 1969 or 29 cents per capita.
Tea	Spent $12 million in 1969 or 6 cents per capita.
Juices	Outlay of $40 million in 1969 or 20 cents per capita.
Beer and Ales	Spent about 6% of sales on advertising in 1967-68.
Retailers	Check of ads for four weeks in January, 1971, two major markets found following average result.
Soft Drinks	Soft drinks advertised 20 times.
Coffee	Coffee ads appeared 40 times.
Tea	Tea included in ads 2 times.
Juices	Juices appeared 90 times in food store ads.
Beer and Ales	Beer and ales were included 20 times in market where food stores handle beer.
PRICE SPECIALS	
Manufacturers	Use of couponing and cents off deals are increasing for beverages.
Retailers	Competing beverages advertised an average of 45 times per week in January, 1971, in two major metropolitan markets surveyed.

For Market Sales Evaluation		Information Required	Information Source
Likely Occurrence	Importance if Occurs		
High	High	Change in dollar expenditure.	Nationally based advertising audit service for local market area; available.
High	High	Change in number of households reached by the ad.	
High	High	Changes in advertising recall level by consumers.	Survey of all local media offices, radio, television, newspaper, and billboard.
High	High	Number and duration of special advertising of campaigns.	
High	Moderate		
High	High	Audit of food store ads in newspapers, television, radio.	Survey of advertising directors for food chains in local market area. Use of local auditing service to spot and keep records on advertising by retailers in local market area.
High	High		
High	High	Record of special door to door circulars by mail or otherwise.	
High	High		
High	Medium	Number of coupons or cents off deals in market area.	Store visitation.
High	High	Product included, market share represented by stores involved.	Store visitation.

MARKETING ACTIVITIES FOR COMPETING BEVERAGES

Item	Importance
NEW PRODUCT INTRODUCTIONS	
Coffee	Freeze dried coffees introduced. One company spent $0.51 million on radio spots alone for their brand.
Tea	Instant and flavored teas increase convenience and can thereby affect frequency of use.
Beer	New light beers, according to recent reports, scheduled to enter markets in 1971-72 and can appeal to present non-beer drinkers.
PACKAGING AND PRODUCT AVAILABILITY	
Container Sizes	Soft drinks in cans, non-return bottles influence convenience of use.
Vending Machines	Vending sales, all items, up about 10% per year since 1965. Soft drink sales through vending machines totaled $1.3 billion in 1969. Milk sales were only $144 million. Number of soft drink vending machines in U.S. increased 62% from 1967-69.
Changes in Number of Retail Food Store Outlets	Total number of retail food stores decreased 11% according to U.S. Census during 1963-67.
Eating Establishments	Franchise food establishments with limited menus represent increasing share of the market.

GOVERNMENTAL PROGRAMS AND ACTIVITIES

Item	Importance
SUBSIDIZED SCHOOL LUNCH PROGRAM	1.6 billion lbs. (16 mil. cwt.) of milk per year is used in school lunch program.
CHANGE IN NUMBER MEALS SERVED, BY SEASON	Seasonality is a big factor in use through schools. Ex: 354 mil. ½ pts. in October, but only 40 mil. in August, 20 mil. children served in December, 1968, but only 200,000 in July, 1969.
CHANGE IN FOOD STAMP PROGRAM AND SURPLUS COMMODITY DISTRIBUTION	Both food stamp and surplus distribution programs can result in increasing per capita consumption by low income families.

For Market Sales Evaluation		Information Required	Information Source
Likely Occurrence	Importance if Occurs		
Low	Medium	Date of market area introduction and sales volume.	Store visitation.
Low	Medium	Date of market area introduction and sales volume.	Store visitation.
Medium	Medium	Date of market area introduction and sales volume.	Store visitation.
Low	Medium	Date of market introduction of new containers and effect on sales.	Store visitation.
Medium	Medium	Number of vending machines and market segments or area covered.	Franchise owners.
Medium	Medium	Number of new stores and number going out of business.	Chamber of commerce.
Medium	Medium	Number of franchise operations opening in the market and number of meals served.	Chamber of commerce.

For Market Sales Evaluation		Information Required	Information Source
Likely Occurrence	Importance if Occurs		
High	High	Number of schools and number of children involved in subsidized lunch program.	Public and parochial school administration.
High	High	Number of meals served and volume of milk used.	Public and parochial school administration.
Medium	Medium	Changes in products available in food stamp program, frequency volume; number of families or persons involved.	Local food stamp office, county welfare office.

GOVERNMENTAL PROGRAMS AND ACTIVITIES

Item	Importance
DISASTER RELIEF DISTRIBUTION	Depending upon extent, this can be a strong factor for duration of disaster.
SCHOOL BREAKFAST PROGRAMS	A growing number of children and schools are coming under this program.
HEAD START PROGRAM	As more public school systems adopt this program it will not only result in increased milk consumption by the younger children but also affect the seasonality.

ECONOMIC, SOCIAL AND OTHER MARKET CONDITIONS

Item	Importance
CHANGES IN DISPOSABLE INCOME FROM:	
Employment Level in Market Area	Employment level in local market area will fluctuate seasonally and over longer periods as basic economic conditions change. Unemployment has increased from 3.5% to approximately 6% in the last year in the U.S.
General Level of Wages and Salaries	Shifts in wage levels reflect changes in income levels. Studies have shown that income and price together account for 52% of variation in milk consumption.
Strikes and Work Stoppages, or Overtime	Temporary interruptions in employment can have strong effects on consumption levels of fluid milk through the sudden changes in income which may result. For example, the number of man-days idled due to strikes tripled during the recent strike in the auto industry.
CHANGES IN COST OF LIVING	Increases in cost of goods and services cause a readjustment of spending patterns by consumers. Over the last three years general food prices have increased 11% while prices of fluid milk have increased 7% at retail.
CHANGE IN AGE DISTRIBUTION OF POPULATION AND BIRTH RATE	Studies have shown that consumption of milk varies with age and is higher among children. The addition of one child under 4 years of age to a household will increase household milk consumption 1.46 quarts per week. There were 3 million less persons in 1970 under 5 years of age compared with 1960. This is a decline from 11.3% of the population in 1960 to 8.4% in 1970.
CHANGES IN ETHNIC GROUPS POPULATION	Blacks and Spanish-speaking people drink less milk. Previous studies indicate that the average white household uses 3.6 quarts of milk more per week than the average colored household.

For Market Sales Evaluation		Information Required	Information Source
Likely Occurrence	Importance if Occurs		
Medium	Medium	Duration, number of people and volume distributed.	Local office of civil defense, county welfare office.
High	Medium	Number schools in the program and number children involved, or volume of milk used.	Public and parochial school administration.
High	Medium	Number of children in the program and number children involved, or volume of milk dispensed.	Public and parochial school administration.

For Market Sales Evaluation		Information Required	Information Source
Likely Occurrence	Importance if Occurs		
Moderate	Moderate	Number of people employed by time period or percent of labor force employed.	Federal and State Employment Offices in the local market.
Moderate	Moderate	Wage and earning rates by major industries in the market.	Bureau of Labor Statistics reports, Department of Labor.
Moderate	High	Extent and duration of interruptions.	Offices of State and Federal Employment Agencies, offices of local labor unions.
Moderate	High	Price indices for standard commodity groups.	Consumer Price Index published by the Bureau of Labor Statistics available through the chamber of commerce.
Continuous	Low	Number of births per 1,000 population. Standard published rates.	Such information may be available from chamber of commerce or local libraries.
Continuous	Moderate	Number of persons and number of families by ethnic group.	Census of population, special studies.

ECONOMIC, SOCIAL AND OTHER MARKET CONDITIONS

Item	Importance
CHANGES IN THE RATIO OF "BLUE COLLAR" TO "WHITE COLLAR" WORKERS	Blue collar workers are much better milk consumers and are dropping in relation to white collar workers - from 41.4 to 35.5% of working force from 1960 to 1969.
CHANGES IN AWAY-FROM-HOME EATING	Away-from-home eating is increasing. The probability of drinking milk at a meal away from home is only about half that of a meal at home. The trend is away from fancy restaurants to fast food shops where competing beverages are heavily consumed.
MILITARY POPULATION	Changes in military population not only affect milk consumption directly, but may affect the economy of the area. Records at Bergstrom Air Force Base in Austin show milk sales through comissary amount to 190 pounds and cheese 9 lbs. per capita per year. In addition 1/3 as much cheese +10% as much milk is dispensed through mess halls.

FACTORS AFFECTING CONSUMER SHOPPING HABITS AND MOBILITY

Item	Importance
CHANGES IN PAYROLL PERIOD	Payroll periods (singly in combination with other periods) are days of heaviest shopping traffic.
NUMBER OF WEEKENDS AND HOLIDAYS IN PERIOD	In a survey, 51% of retailers reported Saturday as heaviest shopping day for milk. Number of weekends also affect monthly sales.
ADVERSE WEATHER CONDITIONS	Severe weather conditions affecting consumer mobility or consumption habits could result in substitution of other beverages and nonfat dry milk for fluid milk.

For Market Sales Evaluation		Information Required	Information Source
Likely Occurrence	Importance if Occurs		
Continuous	Moderate	Number and percentage of the labor force in each classification.	Bureau of Labor Statistics, employment agencies, local labor unions, chamber of commerce.
Continuous	Moderate	Number and type of eating places; dollar volume of business; customer count.	Local chamber of commerce, restaurant association.
	Low to high - depending on magnitude of change.	Number of military personnel and families in local area: commissary records of milk purchases.	Records of base commissary and mess halls: Handler - supplies record.

For Market Sales Evaluation	Information Required	Information Source
Importance if Occurs		
Moderate	Number of payroll periods and frequency.	Payroll offices of major employees.
Moderate	Variation in number of peak shopping days in period.	Sample of major retailers.
Moderate	Excessive rainfall or temperature changes.	Weather bureau records.

SIZE OF MARKET

Item	Importance
CHANGES IN POPULATION TRENDS	Number of people and/or number of families in the market will directly affect the level of total milk consumption in the market.
SHORT TERM CHANGES IN NUMBER OF PEOPLE IN MARKET AREA	Movement of large numbers of people into or out of a market for short periods of time such as colleges, universities, conventions, etc. has a significant impact on total milk consumed in the market.

For Market Sales Evaluation Importance if Occurs	Information Required	Information Source
Moderate	Changes in number of people and number of families.	Chamber of commerce; census bureau of statistics; universities, colleges.
High (for duration)	Number of people in attendance; length of stay; food expenditures.	Colleges, universities, convention bureaus, chamber of commerce.

DATA SELECTION

Whatever analysis model is selected for a promotion test the relevant data must be assembled. Alternatives exist as to the specific kind of data and sources used. Consideration of costs of data collection and its availability in the time frame desired is part of the ultimate decision regarding data inputs for the market analysis. In some cases, objective criteria can be employed in decision making, but for others there is only a best, or experienced judgment basis of selection.

A considerable range of data and sources will be reviewed and evaluated, based upon the four city research, plus the broad market test experience of the Market Research Center staff. Generally, the presentation order will be keyed to the tabular form sequence in the preceding section.

Advertising for Fluid Milk

Measuring the input into advertising, on a measingful basis, is fraught with numerous assumptions and contingencies, though we would like to think otherwise. As in the pedagogical example of fertilizer application and crop yield response, many intervening interactions occur that are far from fixed or certain. Application of 10 percent nitrogen does not guarantee that 10 percent is made available to the plants. Soils (markets) differ, weather conditions (other advertising) varies, and the efficiency of one form of fertilizer (advertising copy or media) is not necessarily equal to another.

Total dollar expenditure on advertising is the simpliest and most direct measure of promotion input. So long as all other factors are the same --

ad copy, media mix, time of ad occurrance, cost per ad space or time segment, and associated audience exposure rates, to mention the major ones -- dollar outlay is a dependable variable for analytical purposes. From the theoretical viewpoint, it must be recognized that, in essence, the same problem exists in comparing advertising that exists in inter-personal comparisons when using indifference curves. What a hundred dollars will do for one person is not what it will do for another unless all ceteris paribus conditions are fulfilled, and we have difficulty even measuring those conditions. Were this not so, the need for and practice of expensive, time consuming multi-market tests of new product introductions would automatically collapse.

In the case of the American Dairy Association matched-city test of three input levels of advertising expenditure, most of the ceteris paribus requirements were met. A fixed package variation of advertising over time was used among each of the matched cities. The essential point is that one must very carefully assess, in detail, the assumptions which lie behind the experimental test and the analytical model being contemplated.

Since dollars are not related on a one-to-one basis to advertising exposures, and instead some kind of a production function exists, representing changing marginal rates of audience exposure, an alternative is to use audience exposure itself as a variable. Television and radio media in major cities have audience ratings of time segments which are periodically updated. It is largely on the basis of such ratings that their advertising rates are based. It is also used by the stations as a measurement of their programming success in their market area. Several independent rating organizations operate and provide this

service to the stations. Newspapers keep circulation records which are an index of their audience coverage.

Audience ratings are, in themselves, not fool-proof. The fact that the television set is on, with someone viewing it does not assure that in each instance the commercials are watched.

A more specific measure of advertising is to obtain ad recall data from consumers. This is the most direct measure of audience exposure, but entailed is a special consumer survey to secure the information. This source too has some inaccuracy from respondent's error as to knowledge of the ads, any interviewer biases that might arise, and normal sampling error associated with survey sample size. Thus it is a matter of degree of error in dollar versus alternative audience measurements that must be considered in data selection for a particular market analysis.

The media mix and the ad copy used by the dairy processor-distributor, by the retailer, and industry (such as the American Dairy Association) are not usually the same. To use an aggregate expenditure by the three, though constrictions of a model may require it, is not as desirable as keeping them separate.

Measurement data for advertising, dollar or audience base, can be obtained in some cases from the respective media in a market. At times the information is considered highly confidential and one is referred to the client involved. Audit services exist that keep records and clipping services of advertising and these may be helpful. An advisable procedure is to set up a log, by media, of all advertising of related products during the course of a market test.

Television and radio stations have logs from which information will be provided. A clipping service can be subscribed to or set up, in-shop, for the duration of a test period. Newspapers and magazines would be included, the latter being the more difficult because of the sheer number of publications involved.

Whereas the foregoing is directed to advertising measurement for milk, the analysis problem is further aggravated when those for closely competing products are considered. Inter-campaign, like inter-personal, comparisons become even more complex. Likelihood of the advertising media mix being the same is small, not to mention the other variables that enter into a promotion campaign.

Changes in Merchandising Activity for Milk

In-store displays

Store audits are the preferable means of generating in-store merchandising activity data. Though industry or handler sponsored in-store promotions are scheduled for a set of stores, all may not put it into operation. Experience has shown that pre-calls at individual stores regarding the campaign do not even assure compliance. Consequently, personal-visit store audits are the only reliable data formulation system.

Special displays present objective measurement needs. Often the size of the display is increased to be in harmony with the display material kit supplied to the store. Square feet of display space should be counted each week, preferably during the Thursday-Saturday week-end heavy shopping period. Care must be taken to not miss extra location displays, since some special

displays are carried apart from the usual shelf location of the products under sales analysis.

When display size is not affected and only point-of-sale product reminders are used, the measurement problem is compounded. About the only out is to count the number of pieces and measure the size of the promotional material employed. Lacking a meaningful physical measurement base, one may need to resort to use of a dummy variable in the market analysis which simply reflects the presence or nonpresence of the point-of-sale material in a given store.

As in the case of media advertising, placement of and notice by consumers of point-of-sale material are different levels of measurement. It is possible to conduct on-site interviews of customers to ascertain awareness of special displays. A properly balanced sampling system is required both over time and among stores to obtain a reliable reading of customers' display awareness.

Special promotions

Some facets of special promotions have a measurable dimension whereas others do not. For example, the provision of trading stamp bonuses for the purchase of a product as a special feature could be measured in terms of number of stamps issued as well as product movement. Knowledge of the offer could also be researched. Tie-in sales deals with another product, unless packaged together, leave little to measure other than the volume of sales achieved. Other outside factors, it must be recognized, may have accounted for a portion of the total.

A special coupon deal can be measured in terms of the number distributed versus those redeemed. The same applies to premiums offered in a market such as those to children, where the item is obtained upon some proof of purchase of the product promoted. The analyst may be faced, because of extenuating circumstances, with simply the alternative of using a dummy variable in the analysis that records the presence of a special promotion during periods of the overall market test.

Price Changes

The effect of price changes for fluid milk retail sales have been measured through the usual time series correlation analyses. Approximate results, an elasticity of 0.3 percent, were indicated in the preceding section. Decided differences can occur, however, between short and long term price change responses. Federal Market Orders have largely stablized milk prices and distributors have avoided direct price competition. Non-price competition has consequently assumed the lead role. At times the price situation is present by entry of a new brand in the market.

More subject to change are prices of milk in automatic vending machines and among eating establishments. Cost of associated services may induce price changes that affect sales volume. Inter-firm competition is low key for a single item like milk, thus, shifts in total customer count are less likely to occur.

Retail price data for fluid milk is comparatively easy to obtain. The central offices of food chains and eating establishments will supply the data on request. An alternative is to collect price data in the course of

store audits. Attention must be given to use of an appropriate store sample or market coverage. The small convenience food distributor be it the Mom and Pop type of store or the newer chain establishments, should be included.

A major factor to look for in milk pricing is any change in retail containers. Prices may be adjusted this way in an otherwise stable price market. For example, introduction of one-gallon retail containers required a new price to be set for that size unit. Faced with a new container and its own price, the market analyst is driven from the use of a simple composite price or that of a single one as an indicator of price level. Adjustments in the market share of each container size will be instigated thereby affecting the average retail price of milk. Contingencies of price actions of the type mentioned make it desirable to price several, if not all, container sizes rather than using one as the indicator.

Product Quality

The trend toward fewer milk deliveries to retail outlets increases the product quality hazard. Large commercial dairy plants can, and on rare occasions do, encounter unanticipated processing equipment and handling problems. A sizable market segment is affected and carryover effects are more pervasive.

Little direct data are available at retail to monitor the presence of quality inadequacies unless they become serious enough to engender customer complaints. Tests at the processing plant are on a large batch basis. City health department evaluations are infrequent.

The researcher is forced to rely on such processing plant and retailer reports as can be obtained. A small, city-wide consumer survey could be involved as a check on the presence of any quality problem if one were suspected.

Packaging of Milk

A marketing axiom is that if the product is available in the household, it is that much more likely to be used. Effort is made in packaging to increase the convenience of taking home an adequate supply to fulfill all needs until the next regular shopping trip. From this concept was launched the six-pack or multi-pack now widely used for numerous beverages.

Milk packaging has been generally less innovative than that of other beverages, for reasons that will not be considered here. Nonetheless, when changes do occur the impact on market sales should be evaluated, whether a market test is underway or not. Effects of container changes can be favorable or unfavorable.

A problem of the waxed paper cartons was the slaking off of wax particles into the milk. Plastic cartons solved this difficulty and consumer preference swung to the new carton. Introduction of the plastic, one-gallong jug with convenient built-in handle facilitated the handling of this size container. There has been some experimentation with the concept of refrigerated home milk dispensers comparable in design to those used in commercial eating establishments.

During the course of a market analysis, it is easy to maintain container reconnaissance within retail store audits. Periodic checks regarding home delivery, commercial eating establishment and vending machine containers can complete the required monitoring. Food chain organizations generally have an order guide. All products and container types and sizes are listed thereon. Consequently, it is suggested as a convenient reference source. Each store as well as the central office has copies of order guides.

As in the case of changes in product pricing, short-term, intermediate and long-range effects vary, making analysis complex. When new size or type containers are accompanied by a new price for that size unit, compounding of effects results. So long as the basic price structure for milk remains unchanged, assignment of the effects to the container is probably the best choice.

Superimposing of container and price changes on an advertising campaign, presents further compounding effects. It can only be hoped that the timing of these factors is separated so that effects have a better possibility of being isolated. It would be unusual for all processors (handlers) in a market to change containers simultaneously. A research model based upon individual store audits would permit a comparison of sales in stores with and without the new container. Examination would need to be made of the otherwise comparability of the sample of stores with and without the new container. Emphasized, of course, is the need to have prior full knowledge of handler's marketing plans for the duration of the promotion test -- and better yet their cooperation in avoiding such a test interference. Superiority of a store unit research design over using a total market unit is obvious in handling unexpected contingencies.

Milk Availability in Retail Outlets

Propensity toward a simplex design for sales measurement, often leads to disregarding possible changes in product availability. Probability of an availability change increases with the length of the study and the rate of population growth, or relocation, in the test market. Most major cities have growing suburban areas that engender the location of new retail food outlets -- convenience drive-in type and/or supermarkets. Strip shopping centers in older areas of cities, if not modern, are dying out and are replaced with free standing sites of supermarkets. The transition, however, is not a smooth one so customer convenience of store locations changes. Purchases of a convenience item like fluid milk can be directly affected.

A second dimension of product availability is store hours and days open. Discount centers with food departments are adding to the pressure for longer operating hours and Sunday service, except where the so-called "blue laws" forbid it. In some markets at least, Sundays represent the second largest day in store sales volume.

Prior to designing a market test, it is advisable to check with all existing food retailing chain executive offices in the market as to plans for new store development and old store closings. More difficult to secure is advance information on outside firms with plans to enter the market. National and regional discount firms in particular are making new market entrys every year.

Knowledge of the planned or potential changes in food store locations will serve to improve decision making between using retail-store units as the research base instead of total firm data.

Several information sources are available to evaluate the competitive mix in a market. The area telephone book yellow pages provide a start, but one must guard against the fact that some chains do not list their stores in either the yellow or white pages sections. Editors and Publishers Guide, issued annually, carries a listing of major food firms and number of stores each has in a market. Supermarket News issues a directory of food chains by major cities and estimates the respective market share of each in the particular city. Title of the report is Distribution of Food Store Sales in 281 Cities. The Chain Store Guide Directory is published annually by Business Guides, Inc. and lists total number of stores and how many are supermarkets as well as providing useful information about the total sales of the firm, names of principal executives, address and telephone number of the headquarters office. Most of these directories are available in university libraries.

The foregoing publications checked over a period of years reveal the rate of past change in retail food outlets insofar as their coverage goes. The most complete count can be secured from the County Business Patterns, publication of the U.S. Department of Commerce. Data are evolved from social security reports on employees and represent the most comprehensive count aside from the U.S. Census of Business reports each five years.

A separate dimension of product availability, of course, is whether or not a store carries the product, or if so, whether it is a part of the full line. Variance in stocking policies is the reason for continuing retail availability studies provided for a fee by national research firms. Firms engaged in this activity can be ascertained by reviewing a recent issue of the directory of the

American Marketing Association. Computerization of store operations is increasing and as a consequence, within product shelf allocations will become subjected to more scrutiny. If store audits are run as a part of the market test research design, which is recommended, the changes over time, if any, and variations within product line from store to store can be easily monitored.

Changes in Milk Home Delivery Routes

Decreases in both number of and frequency of delivery on home delivery routes by milk handlers has characterized the last several years. Fortunately monitoring of this factor is relatively easy since the information is obtainable from the sales manager's office at the handlers executive quarters. Care must be exercised to be fully informed as to the length of time the appropriate records are available and if special arrangements for record retention are required. Miles of delivery routes and number of customers per mile are measurement dimensions. Average size of delivery per customer should be checked to see if it is changing enough to require inclusion as a factor. Total home deliveries may be an adequate variable.

General Publicity Affecting Milk Image

Public media

Articles, books, news items, and broadcasts are all possible sources of favorable or unfavorable comments, opinions, reports, or recommendations concerning the human diet and the place of milk within it. Children are

influenced by cartoons in the newspaper, magazines, or on television. Documentation of every possible source is nearly impossible. Furthermore appearance of an item may or may not have any perceptable influence on consumer behavior. Irregardless, a monitoring of the more popular media is recommended. Should a significant publicity matter occur in the midst of a test, at least the researcher is alerted to the problem. If sales data controls cannot separate the effects, a small but well designed consumer survey may be called upon as an indicate of whether consumer attitudes were affected and purchases modified. Experience of the Market Research Center staff cautions against expecting a high correlation between sales effects and consumer reports of purchases on a recall basis of several weeks.

Auditing of media is best accomplished by obtaining copies of area newspapers, popular magazines, and monitoring of products included in women's programs over the air. The latter is obtained from the respective program directors or moderators.

Nutrition education programs

Four sources of nutritional education programs are usually encountered. Home economists with state extension services, utility company home economists, school home economics courses, and finally privately sponsored radio or television programs. The County Agent office, executive offices of utility, school and university, and newspaper, radio and television stations can supply details as to the best procedure for obtaining desired records.

Some commodity groups sponsor nutrition education insofar as special diets are concerned that feature one of their products. A grapefruit diet

has been promoted recently but not by the industry itself. Attempts to check all conceivable sources would present a near endless task. Food trade members in a market, especially merchandise managers of food chains and advertising managers of mass media are cognizant of current or future programmed activities. Lead time given in the placement of advertising varies and one cannot be absolutely sure or protected against unanticipated programming.

New or modified products

Attention to new or modified products will be considered at a later point, but when these involve vitamin or other food element enrichment that is stressed in promotion activities a reflection on milk may result. Trends toward food enrichment percipitate more of a negative than positive effect, for the implication of the need for other foods is lessened.

Sources of lead intelligence come from the advertising managers of mass media companies in the market area. Measurement of effects is questionable except in an indirect way. If the same promotion occurs in all test markets or over all stores audited, the effect may essentially wash itself out since it would apply to all treatments. Use of a dummy variable, representing presence or not may be the only way out.

Price setting image effects

We are not concerned at this point with price policies that are within the normal range of expectation and implemented in a usual business-like manner. On the contrary, involved are price wars or any other circumstance associated

with a price policy which may leave an inference that milk is priced beyond limits consistent with production and marketing costs. Buyer resistance is invoked under such circumstances and can negate any other market development efforts in progress.

Professional quality consumer opinion research is necessary in order to resolve the question of degree of consumer concern over milk pricing. Press articles are likely to discuss the situation if it has much foundation. Opinion research supplements measurement by providing some objective scale of the effects, aside from any identifiable changes in the level of product sales that may be associated with the situation. Confounding influences make the task a difficult one and again point to the need of full cooperation of all milk marketing agencies during a test. Matched cities may permit isolating the effect if only part of them are involved. The procedure would be to introduce the disturbance as an analysis variable in addition to those previously planned.

Changes in the Supply and Movement of Milk in a Market Area

Theoretically only one research design avoids concern with changes in the supply sources of milk. That would be a consumer purchase panel which provides a record of all purchases regardless of source. Problem is that the operational aspects of consumer panels make them unsuitable for measurement of sales with a high degree of accuracy. Experience has shown that it takes ninty days for a panel family to become both adequately trained and to overcome distorted purchase behavior stimulated by becoming a new panel member. Nation-wide consumer panel firms advise their clients to use the total sales data more for

relative change indicators than absolute level measurements. The primary purpose of a panel is to provide internal information as to consumer purchase behavior, size and frequency of purchase, household attributes of purchasers and non-purchasers characteristics of heavy versus light buyers and type of retail outlet patronized.

Local milk handler data can be affected by direct relief distribution of dry powdered milk, reassignment of military base, and other institutional contracts. Retail store data will be affected by School Lunch, Head Start, direct relief distribution of milk in any form, as well as changes in operating policies of military bases, such as availability of a post exchange for food purchases or the proportion of on versus off base feeding of base personnel.

Market entry of new retailing establishments can bring new supply sources. Particularly discount chains are inclined to centralize purchases with a few suppliers. Such suppliers may be located in the area of the home or division office of the chain and thus draw milk from a market area considerably removed from that of their stores.

Whereas the above supply shifts apply to consumer markets of several types, equally important are shifts that may occur in supplies to handlers. At times price conditions encourage bootlegging of milk from outside market areas. Current transportation equipment makes inter-market milk movement easy from the physical handling standpoint.

Internal supply problems arise if strikes, by either local labor unions or producers occur. Severe weather conditions impede milk supplies from whatever source.

Guarding against the possibility of overlooking action by one of these supply variables requires a firmly established intelligence network to supply the market study. Communication ties with the purchasing department of milk handlers and food chains, schools, military bases, and the office of the federal market order for the area (if there is one) are obligatory. Any mistakes as to market supplies could modify and possibly negate the whole test results. Apprizement of developments on anything less than a weekly basis leaves possible gaps in the adequate handling and coding of the fluid research data. Clearly someone has to be responsible during the entire course of the market test for market surveillance. Being physically present in the market is the only safe procedure and that duty must be assigned to a very alert and responsible person.

Occurrance of any of the supply modification factors leaves the analyst with only about two options. One is to throw the period (including abnormal purchase level follow-up days) out of the analysis. Preferred is a second choice of applying a special treatment code or dummy variable to the data of the relevant period.

Changes in Advertising for Competing Beverages

If one lacks cognizance of the magnitude of advertising budgets for beverages competing against milk, a quick resume is available by consulting summary statistics in selected issues of Advertising Age. Some data are noted in the previous sections. Figures are cited by media as well as in terms of spot versus program involved advertising. Outlays by specific brands appear and reflect individual company strategies.

It is unfortunate that the tactics used for soft drinks, coffee, tea, fruit juices, and beer and ale have not been available to fluid milk. Use of couponing, cents off specials, premiums and related devices have been difficult to apply to milk in the framework in which it has been marketed. Campaigns embodying the foregoing techniques have a considerable short-run impact if properly conceived and may thereby affect fluid milk usage in the short-run period critical to a market test.

Any of three sources may instigate the particular beverage advertising -- processor, distributor, or retail store. Likewise, all three may combine efforts. How to detect the activity is the chore of the researcher. Fortunately, most campaigns are associated with some support advertisements. In those, surveys of the advertising media offices in the market area will disclose the program. Even advanced planning can be learned if the proper research approach is employed.

Distribution of coupons deals directly to the home by mail or by field services requires added surveillance to pick up. Post offices and door to door distribution companies have to be coordinated into the total market overview.

Competitive advertising calls for the selection of some unit of measurement. Total dollar outlay is again a simple and direct one. Yet the media consider clients' expenditures as confidential, and rightly so. Reference back to the client may be suggested by media officials as was frequently the case in the four market survey. All is well if the client is cooperative. What if he is not? Obviously the campaign cannot be ignored. Implementation of the dummy variable can be called upon but researchers like to be more precise.

An out from the above dilemma can be devised with some effort. Data can be prepared through a derived cost estimate. Length of air time and in-day position can be calculated and advertised station rates applied. Newspaper ads are purchased according to the number of lines represented. A 600 line ad, for example, is equivalent to approximately a fourth of a page in the typical newspaper.

Dispatch of household circulars carrying coupons can be costed at estimated delivery cost plus redemption rate expenses. Consultations with advertising agencies will provide redemption rate estimates. Failing that, a telephone consumer survey can give a basis of estimation.

Use of a dollar cost figure is a good common denominator or, in effect, an index of multiple activities. As for all indexes, it must be recognized that a considerable amount of information and accuracy may be lost in the transition.

A third avenue of analysis is possible for competing beverages -- direct measurement of sales. Simple as it sounds, this approach quickly becomes overwhelming because of the a) multiplicity of brands and b) package sizes. It is far simpler to measure special advertising or promotion efforts, by some objective means, than to audit continually sales of a wide range of products, many of which may not see special market action.

A fourth means of competing product evaluation would be the use of warehouse withdrawal data for the food chains supplemented by a beginning and ending store inventory audit. Record keeping on a monthly (four week) basis or longer would permit this system. Though one might be tempted to use

inventory data from a sample of stores within a chain, it is not recommended. Too much variation may be encountered in a small universe, so pre-evaluation of the accuracy of such a procedure is required before decision making.

In-store merchandising changes

Each supermarket manager, just as in an independent store, is responsible for the performance of his business. Special in-store displays frequently are keyed to the advertising program of the central office but latitude still remains for the local store manager.

Multiples of two to four times normal sales are commonly achieved by special in-store displays. The shorter the accounting time unit used in a market test design, the more leverage in-store displays have in affecting test results. Special displays are reducible to common measurement in a study if display square footage is tabulated and introduced as an analysis variable. The method of product display requires consideration in determining whether square footage is appropriate. Shelved items are best counted in terms of the number of linear feet of shelf space or in terms of the number of product facings, visible to the shopper.

Presence of point of sale material, as discussed with respect to milk, is best handled with a dummy variable indicating use or non-use in a store, if the material is judged as possibly significantly influencing sales. Measurement of the display material may be considered but usually is not necessary. Store audits, of course, are required on a weekly basis to properly record such a variable.

New product introductions of competing beverages

Innovation has been substantial in the beverage field in the last decade. Instant mixes, powdered and freeze dried, have notably enhanced convenience of product usage. Synthetics and para-synthetics are more pervasive than before. Just as for new promotions on existing products, the only sure screening for new product introductions is constant market surveillance. Auditing of the retail sales is advised if a new product appears. Taking that step can avoid the further need of measuring any advertising or promotional effort associated with it.

Changes in packaging and product availability of competing beverages

The same format for measurement can be used as that outlined for fluid milk in an earlier part of this report section. Attention to kinds of package changes is critical. Only those that represent significant improvements in use convenience, product quality enhancement, new pricing strategies, or consumer images of the product need be considered for separate evaluation in the overall market test.

Availability changes are more likely to occur in the form of vending machines, in-plant feeding, and other commercial eating establishment produce use than among retail food stores. New products, of course, are likely to reflect a widening retail store availability over time.

Auditing of vending machine locations would be difficult. Hopefully cooperation of the vendors could be obtained in reporting new placements of equipment and effects on their total sales of the relevant products.

Unit sales would be preferable. The researcher can then decide whether combining of the sales figures with others is appropriate on a dollar equivalent basis or whether a gallonage base would be best. A review of the telephone yellow pages directory under various classifications of food dealers will provide a contact list of most vendors or food caterers. Double checking with establishments where vending machines are placed is recommended since yellow page directories are not entirely current. Local chambers of commerce are also worth consulting to see if a firm has been overlooked.

Influences of Governmental Food Programs

Consideration was given elsewhere in this report section to facets of governmental food programs directly dealing with fluid milk. A further dimension deserves attention. Eligibility requirements for such programs are subject to administrative decrees which directly influence the number of participants. Thus, in effect, a population type of variable exists in government programs. Added is flexibility in the allocations granted to participants which also are, in considerable part, subject to administrative discretion. Where households participating in relief make up 10 percent or more of a cities' population, potential effects of decisions directly affecting that large a population segment simply cannot be disregarded.

Welfare programs are not strictly surplus commodity outlets as was once largely the case. Even so, where surplus commodity conditions are consistent with dietary balance, greater quantity variations flow from administrative decision making.

Direct food distribution is recorded by the appropriate welfare office. Food stamps, now being extended in geographic coverage, present a different problem. Operational units charged with program analysis make tabulations as to the quantity of various foods used. Data sources are known by local county offices. Possible lack of coverage, or loop holes in reporting, requires scruting from a data adequacy viewpoint. A relief family previously spending fifteen dollars a week on food and eligible to buy stamps on a one dollar cash to four dollars of stamps ratio does not move to sixty dollars a week for food. The household may pay only eight dollars for food stamps for a total buying power of thirty-two dollars compared with the previous fifteen. For this reason, actual stamp redemptions on specific foods are required.

Public and parochial schools administrative offices will provide information as to commodities used in School Lunch and Head Start programs. Actual product usage is a simpler, more direct variable than number of meals served so it is better to avoid the latter if possible. One difficulty arises that can be troublesome, but probably not for fluid milk. Allocations are made on the basis of stated time periods and rate of usage of the product can vary considerably from shipments received. Care is needed to be certain which type of figure is being supplied.

Disaster relief, of course, is not a likely occurrance. Should it be encountered, a two faceted phenomenon confronts the researcher. First, normal supplies were likely interrupted and secondly the proportion of the gap covered by incoming relief supplies has to be ascertained. A gallonage or similar physical measurement is called for since value figures for commercial versus relief supplies would not be comparable, unless adjusted.

Data should be available from city and county agencies involved in the relief program or those such as the Red Cross, if involved. Civil Defense offices are frequently activated and are information points to contact.

Economic, Social and Demographic Variables

Consumer income changes

Events of 1971 remind us that full employment is not a normal condition. Except during some type of military action or immediately thereafter, full employment is often more a goal than a reality. In some markets unemployment is at considerably higher rates than others, depending on the type of economic base the city has and what industries are most affected. Variations from levels of three percent to twelve percent have been experienced in 1971.

Strikes are a real hazard to market tests since their predictability is not accurate nor their length when they occur. Reason exists, therefore, to avoid markets that are heavily based in single industries. A strike under such conditions severely affects income flows in the community. Yet one does not always have a choice in such matters.

Fluctuations in business activity manifest themselves in overtime work and increased worker incomes or short work weeks and below normal pay.

All of the foregoing are usually available from among several sources. Employment may rise and yet unemployment grow because of the population expansion thrust in a market. Both sides of the coin, so to speak, must be counted. State employment offices have records that can be tapped though special, or un-customary, short-period reporting may be essential.

Information on wage rates and hours worked are not kept by the employment offices. Rather, these measures must be obtained from the social security offices to which payroll data are regularly reported on a monthly basis. Shorter period figures require direct data feeds from major employers in the test market. Recommendations are the wages and employment data be obtained which will permit calculation of average pay rates per hour worked.

Union contracts call for automatic increases which may or may not be tied to a cost of living clause. Without knowledge of these built-in changes, effects may be overlooked and associated unknowlingly with another research variable. Labor union offices and/or the employers of union labor would need to be checked and wage formulas recorded.

Automation is reducing the need for "blue collar" workers as a proportion of total employment. Consequently though total employment and wage rates are unchanged, the total payroll may change because of shifts in the labor mix within a market. Pre-knowledge of anticipated automation in a major plant would allow planning to accomodate the adjustments and their data influences. Though a fairly smooth transition is designed in the plant, uncertainties may still abide in workers' minds and affect consumer buying behavior.

Cost of living changes

Consumer price indexes are available for major cities on a monthly basis. Commodities in the index are not necessarily all priced monthly. It is preferable to know the pricing period schedule. Changes from month to month in the index become approximations as a consequence. Prices are for selected

items with strict specification limits. The representativeness of the "priced" item may change over time so due skepticism must be maintained rather than accepting price indexes at face value. Regional offices are maintained by the Bureau of Labor Statistics of the U.S. Department of Commerce and are charged with the responsibility of the C.P.I.

Demographic variables

Two sources of rather dynamic movement within the total population are the age distribution among individuals and the ethnic mix. National totals are reflecting changes but individual markets are more affected because of the higher population mobility within recent years. Comparisons of the 1960 and 1970 Census of Population data will alert the researcher as to the essentiality of monitoring demographic shifts in the selected market area. No complete intercensal year accounting can be obtained. One indicator is the racial mix of school enrollment in the market concerned, which can be secured from the annual school census in respective school districts.

Military population

Military tactics are fluid and so are deployment of training bases for selected purposes as well as terrain. Bases are opened, closed, expanded, reduced, changed in purpose. Given these parameters, one simply has to be in continual touch with the process of such change, and knowledge is not especially available upon request. Initial contacts may have to be followed to higher command levels in order to secure the inputs for market analysis purposes. Implementation must be started early for location of proper

authority levels is a time consuming and sometimes enigmatic process. Once the purpose of the study is clear and proper confidentiality assured, data flows should be approved. Attention concerns the on-base versus off-base allocation of housing and feeding in order that proper transfers and adjustments can be made in data flows from the civilian supply versus military supply channels. Conceivably income is also a factor on the military side but can possibly be ignored unless a drastic change in base operations occurs. A public relations officer would be a good initial contact and from there commissary and mess hall personnel can be located. Simplicity of analysis suggests quantity data on milk used on the base rather than meal or head count, if such figures will be provided.

Changes in away-from-home eating

Opening and closing of schools have a decided effect on the number of home prepared meals. Entry of new food chains, especially cafeterias, modify family meal patterns. Created on the horizon now is the four day work week which has implication not yet documented by research. A comprehensive evaluation would require not only knowledge of the shifts in number of at-home versus away meals, but also the effect upon beverage usage for the same mealtime. The latter would require special market surveys among consumers or reasonably current information from previous ones.

In the case of this factor, it appears that the number of meals eaten at home and away from home as well as the physical volume of milk used in both market segments is essential for a meaningful analysis. Clearly, a decline

in milk consumption could well reflect solely a change in locale of eating of a significant portion of the market population.

Restaurant associations contacted were not market data keepers nor generators. Use of a panel of eating establishments or an index is implied. Adjustments must be made in that event for entry or departure of firms in the market.

Shopping Habit Changes

The shorter the sub-component time units in a market analysis, the more susceptible they are to being affected by shifts in shopping days within a month as a reflection of pay period dates. The other horn of the dilemma is that longer periods involve seasonal changes in use patterns which confound analyses unless the research design neutralizes such a factor. A similar phenomenon is the variation from month to month in the number of week-ends contained therein. Saturdays and Sundays are large volume shopping days in spite of efforts by the retail food industry to even the load over the total week. Design of a test on a monthly basis is a rather poor choice. Week or multiple week time intervals is advantageous. Yet, the monthly pay period cannot be coped with by simply shifting to a week time segment.

Weather effects upon milk market supplies have already been discussed. But weather can more easily upset the normal shopping pattern of a consumer.

Coping with such factors as the above usually results in the selection of a variable that reflects the number of shopping days available in the analysis time segment. Greater weight can be given to week-ends or end of

the month by added dummy variables or by devising a shopping day index to reflect the relative attractiveness of the week for food shopping.

Retailers will gladly provide guidance as to the relative importance of shopping days within the week or month. Upon such knowledge a data system can be formulated. Go to the central executive offices for assistance. Local store managers are not authorized to assume independent responsibilities of working with researchers.

Weather data can be utilized in a similar manner to that of shopping day variations. The kind and extent of records can vary from city to city and must be assumed as always available in the form needed.

Changes in Market Size

Whereas census data are available only every ten years, operational research must operate on a considerably shorter horizon. Sales Management Survey of Buying Power provides yearly estimates of population by counties, cities and total metropolitan (SMSA) areas. Intercensal estimates are based on auxiliary data sources such as utility connection changes and similar indications. High growth markets are expanding by 20 percent or more every ten years, some by double that rate. A long period, one or two year test, must take this population factor into account.

Data sources can be tapped directly such as utility data, residential construction and school enrollment. In a few cities building permits are being recorded by U.S. Census tracts or major divisions so that even within market changes can be used to adjust sales data. The research department

of the Chamber of Commerce, the statistical department of the electric utility company, and the building permit division at the city hall are good data sources. Specified in a request must be new construction connections for utilities and not re-connections to existing dwellings.

Short term changes in the market population can be appreciable if the city is the site of a college or university, a vacation territory, a convention center, or other activities that attract large delegations or groups of visitors. The Chamber of Commerce Convention Bureau in most cities prepares detailed data on visitor attendance at cultural, business, sporting, or other events in the city. Though data are prepared for members only, figures can usually be obtained for research purposes without charge. Again the imperative of pre-analysis of a market in rather fine detail is obvious when one considers all the factors discussed herein that can influence fluid milk sales. Therefore, it is urgent that sufficient time and budget be allocated to this pre-study phase to avoid inescapable analysis difficulties later on.

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