5-1961

The Possible Competitive Position of Utah Milk Concentrate on Selected Western Markets

Richard S. Magleby
Utah State University

THE POSSIBLE COMPETITIVE POSITION OF UTAH MILK CONCENTRATE ON SELECTED WESTERN MARKETS

by

Richard S. Magleby

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Agricultural Economics

UTAH STATE UNIVERSITY
Logan, Utah

1961

ACKNOWLEDGMENT

Acknowledgment and thanks is given to Dr. Rondo A. Christensen who directed the research and gave valuable guidance in writing the manuscript; to the members of my advisory committee for their direction and advice; and especially to the Department of Agricultural Economics of Utah State University for giving me the opportunity to undertake this study.

Appreciation is expressed to the dairy plants and transportation agencies who contributed information and data for the study.

A special word of thanks is due my wife, Donna, who gave much help and encouragement throughout the study; and to those who have contributed their time to the typing of the manuscript.

Richard S. Magleby

TABLE OF CONTENTS

TABLE OF CONTENTS - cont'd.

LIST OF TABLES

Table | Page

CHAPTER I

INTRODUCTION

Developments in Utah's Dairy Industry

Production and distribution have become centralized

During the last two decades, Utah's market milk industry has changed from one of local processing and distribution by small-scale plants to one of state-wide distribution by large-scale dairies. At present, four large producer cooperatives control most of the state's market milk and six large processing plants accounts for more than 80 percent of the state's fluid milk sales.

Along with centralized processing and distribution has also come some centralization of production. Statistics recently published by Utah State University show that in 1957, 56 percent of the market milk produced in the state came from the five counties of Cache, Utah, Weber, Salt Lake, and Summit (13, p. 8)*. These same five counties accounted for over 50 percent of the increase in total production of market milk between 1948 and 1957 (13, p. 9).

Production has increased at a faster rate than population

Production of market milk in Utah has increased substantially during the last two decades. When production figures for 1948 and 1959 are compared, it can readily be seen that Utah producers have not only been

*Numbers in parenthesis refer to references listed at the end of thesis.

switching to Grade A production but have also substantially increased over-all production (table 1). The importance of this trend can better be seen when compared percentage wise to population growth and per capita consumption of fluid milk (table 1). Purchases of Grade A milk increased 125 percent between 1948 and 1959, while Utah population increased only 35 percent.

Table 1. Utah population, purchases of milk by dairy plants from Utah farmers, and U.S. per capita consumption, 1948 and 1959

Item	1948	1959	Change	Percentage change
Utah population, thousands of persons	653[a]	880[a]	+227	+35%
Plant receipts of Grade A milk from Utah dairy farmers, millions of pounds	199[b]	447[c]	+248	+125%
Plant receipts of manufacturing grade milk from Utah farmers, millions of pounds	307[b]	235[c]	- 72	- 23%
Total plant receipts from Utah farmers, millions of pounds	506[c]	682[c]	+176	+35%
U.S. per capita consumption of fluid milk and cream, pounds	355[c]	348[c]	- 7	- 2%

[a]Bureau of the Census, Current Population Reports - Population Estimates, U.S. Department of Commerce.

[b]Wells M. Allred and T. I. Gunn, Wide Variation Between Counties in Production of Grade A Milk, Utah Agr. Exp. Sta. Farm and Home Sci., 14:73, 85-86, 1953.

[c]Agricultural Marketing Service, U. S. Department of Agriculture.

Per capita purchases exceed per capita consumption

Per capita purchases of Grade A milk by dairy plants from Utah farmers changed from 305 pounds in 1948 to 508 pounds in 1959, an increase

of 66.6 percent. During this same period of time, the U.S. average per capita consumption of fluid milk and cream remained relatively constant. If per capita consumption is about the same in Utah as in the United States, a surplus of 160 pounds of Grade A milk existed in 1959 for every person in Utah.

Even if Utah's per capita consumption were slightly higher than the U.S. average, the figures show that plant purchases of market milk have and are greatly exceeding local demand. This excess market milk must either be shipped out-of-state as fluid milk or go into manufacturing and therefore receive a lower price.

Utilization of market milk for fluid purposes has decreased

It is not surprising then that during recent years, Utah dairymen have been looking across state borders for markets. At present, fluid milk products are being shipped into Arizona, Colorado, Idaho, Nevada, New Mexico, and Wyoming. Although these out-of-state shipments increased from 25 million pounds in 1952 to 41 million pounds in 1957 (13, p. 21), a recent study at Utah State University shows that fluid utilization of market milk in Utah has been steadily decreasing (table 2). Results of the study point out that the market milk industry has gone from a favorable supply-consumption balance in 1948 to one of considerable excess supply in 1957 (13, p. 3). The actual drop in fluid utilization was from 85 percent to 64 percent. The study further pointed out that unless something is done to bring fluid sales into balance with plant receipts, the Utah dairy industry will continue to be faced with price depressing surpluses (13, p. 3).

Table 2. Utilization of market milk, Utah plants, 1948, 1952, and 1957

Year	Plant receipts[a]	Utilization[a]		Percentage used as fluid milk and cream
		Fluid milk and cream	Non-fluid uses	
	million pounds	million pounds	million pounds	
1948	195	165[b]	30[e]	85
1952	287	205[c]	82[e]	71
1957	401	255[d]	146[e]	64

[a]Does not include milk handled by L.D.S. Welfare dairies.

[b]Based on estimated consumption of plant sales of fluid milk and cream of 243 pounds per capita, a Utah population of 653,000, and estimated out-of-state fluid milk and cream sales by plants of 10 million pounds.

[c]Based on estimated consumption of plant sales of fluid milk and cream of 245 pounds per capita, a Utah population of 730,000, and out-of-state fluid milk and cream sales by plants of 25,303,000 pounds.

[d]Based on actual consumption of plant sales of fluid milk and cream of 254 pounds per capita, a Utah population of 840,000, and out-of-state fluid milk and cream sales by plants of 41,837,000 pounds.

[e]Plant receipts less fluid milk and cream sales.

Source: (13, p. 15)

Initiation of federal regulation

An attempt on the part of the larger producer cooperatives in Utah to bring at least some temporary relief from the decreasing utilization might be seen from their asking for the initiation of government regulation. In November 1959, Federal Order No. 63 came into effect and provided for a monthly market wide pool of all producer milk and the computation of

a uniform price based upon the market Class I (fluid) utilization. Each producer or producer cooperative in the area was thus assured of receiving the same price for their milk as any other producer or producer cooperative regardless of the individual fluid utilization of the plant receiving the milk. At the same time, nonpool plants have to pay into the pool the difference between Class I price and manufacturing price on all fluid products which they sell in the marketing area. Even with this equalizing of the surplus burden among the majority of the market milk producers in the state, fluid utilization of regulated producer milk in 1960 will only be about 64 percent (25).

A further attempt to minimize price depressing surpluses has recently been incorporated in the federal order program by request of the producers. This is a market-wide base and excess plan which will tend to help balance the monthly production throughout the year and discourage production above the base limit. Also an attempt is being made to increase the number of regulated handlers and the size of the marketing area to further equalize the burden of the surplus fluid milk.

Expansion of markets would increase returns

The federal order program, at the most, can only help minimize further increases in surplus fluid milk. It cannot increase demand. The factors which could do so are (a) a more rapid increase in population than production, (b) an expansion of out-of-state markets, and (c) a greater per capita consumption. Since Utah's population has been increasing less than milk production, the first factor appears an unlikely means of bringing relief. Greater per capita consumption is a possibility, but the recent trend has been downward. Of the three, expansion into new markets appears to be the quickest and most likely means to increase returns to

Utah's dairy industry.

Factors limiting market expansion

Under given price and cost conditions, three principle limiting factors to market expansion or more widespread competition on the fluid milk market are transportation costs, trade barriers, and perishability of the product. Even when transportation cost on whole milk is not such as to eliminate all profit on outer market sales, trade barriers (health regulations, milk orders or commissions, etc.) will often prevent any movement of milk from taking place.

Likewise, the perishable nature of whole milk requires that fairly rapid disposition be made if high product quality is to be maintained. This is sometimes hard to do on new markets.

Concentrated Milk Could Expand Marketing Areas

Description of concentrated milk

Concentrated milk (sometimes called multimilk or 3 in 1 milk) is a product made by reducing fresh whole milk to one-third its original volume. When mixed with two parts water, it again becomes equivalent to whole milk with all nutritional elements.

The two types of concentrated milk that appear the most promising are fresh and sterile. Fresh concentrated milk is usually packaged and marketed in either quart or third-quart containers and must be kept refrigerated just as is fresh whole milk. Sterile concentrate, like evaporated milk, is packaged in cans which usually do not require refrigeration and so can move in channels of distribution which are typical of good products other than fresh fluid milk. Not to be confused with evaporated milk, sterile differs in three aspects: (a) it is concentrated

3 to 1 instead of 2 for 1 like evaporated; (b) it is sterilized before being canned, instead of after; and (c) the process is such that sterile concentrate is relatively free from the carmel or cooked flavor characteristic of evaporated milk (24, p. 4).

Market advantage

Because of its reduced bulk, concentrated milk can be transported for about one-third the cost of an equivalent amount of whole milk. In addition, concentrated milk, especially sterile, has a keeping quality superior to that of whole milk and appears more likely to cross trade barriers. This means that concentrated milk might be a means by which Utah processors could broaden markets and perhaps increase income, both to themselves and their producers. On the other hand, the possibility exists that concentrate could also be a means by which other areas of surplus production might enter western markets and perhaps outcompete Utah milk.

Objectives of this Study

The objectives of this study are to estimate and to evaluate the possible competitive position of Utah concentrated milk on western markets as compared to that of whole milk and concentrated milk from other supplying areas.

In fulfilling these objectives the author recognizes the following limitations: (a) concentrated milk is a relatively new product upon which tests are not yet conclusive, and (b) present or past data are used to evaluate future possibilities. This study, however, attempts to bring together thoughts and figures pertaining to concentrated milk

and its potentials that will serve as a basis for further analysis by those concerned with its impact on western markets.

Method of Procedure and Source of Data

Since the effect which concentrate might have on Utah's dairy industry depends, to a large extent, on the price at which processors in Utah and other producing areas can place the product on the market, the objectives will be accomplished principally by developing and then comparing probable prices on selected western markets of Utah produced fresh whole milk, fresh concentrate, and sterile concentrate with prices of similar products of local origin and from other producing areas. To determine possible competing areas and potential markets, consideration will be given to supply and demand in western and midwestern states. To provide a background for this study and to aid in making a correct analysis, an extensive review will be made of literature pertaining to concentrated milk.

Producer and retail milk prices as well as production and consumption figures will be obtained from government and state publications. Processing and handling costs which will be used, with exception of a few minor adjustments, are those reported in published research material. Information on transportation costs will be obtained by personally contacting milk dealers, transporters and tarriff agencies. Other information on competition, consumer acceptance of concentrated milk, demand and supply, and trade barriers will be obtained from published material and from personal solicitation.

CHAPTER II

REVIEW OF LITERATURE DEALING WITH FRESH AND STERILE CONCENTRATED MILK

Development, Use, and Market Acceptance

Concentrated milk has been the subject of numerous articles, many speculations, and a good deal of research. As early as 1934, an article describing methods for production of fresh concentrate appeared in Dairy Produce (27). During the same year, a fresh concentrated milk under the title of Duo-Rich Milk was introduced briefly on the market. From then until after World War II, apparently little was done with the perfecting of concentrated milk. In 1949, Trout and Quackenbush (44) reported the experimental marketing of fresh concentrated milk by Michigan State College.

In 1950 and 1951 fresh concentrated milk was introduced on various eastern and midwestern markets (26, 45, 19, and 36). Although the public apparently liked the milk, these ventures, for the most part, were unsuccessful. A 1953 summary of sales in seven federal order markets showed peak sales of the concentrate usually occurred within the first few months of itsintroduction (39). The typical trend was for sales to fall off sharply to insignificant proportions during the succeeding months and to terminate altogether within one or two years.

The Department of Dairy Industry of Iowa State University began marketing fresh concentrate in rural areas in July of 1951 (46).

Consumer acceptance was reported to be good even though concentrate sold at the same price per quart equivalent as regular milk. In rural areas concentrate was found to have an advantage over regular whole milk in that its reduced bulk made it possible for a small truck to deliver enough concentrate for a large route of customers. At a recent dairy conference, however, Professor Iverson of Iowa State University mentioned that the use of concentrate in half and half, in low fat milks, in ice cream mixes, and for storage of high quality milk solids for short periods may be more important than retail sales (42, p. 39).

In July of 1951, Safeway Stores, Inc. began selling fresh concentrated milk in some of its California stores at two cents per quart equivalent under legal minimum prices (43, p. 120). The proportion of concentrate to total milk sales in Safeways' San Francisco area stores increased from 20 percent in 1952 to 31 percent in 1958 (3, p. 8). In 1958 four other firms also began to sell fresh concentrate in California (9, p. 8).

In 1951 the U. S. Navy entered into a contract with a company in the Chicago milkshed for delivery of fresh concentrate to the Key West Naval Base in Florida (7, p. 1,238). Both Navy and company officials reported a high degree of acceptance of the reconstituted concentrated milk.

In a study by the Army at Fort Bliss, Texas, fresh concentrated milk trucked in bulk from Wisconsin was found to arrive in satisfactory condition for consumption (33, p. 20). Among the soldiers participating in the tests, no significant difference was found between the acceptability of the concentrate as compared to fresh whole milk.

Parker and Harris (39) report that personnel of the U. S. Armed Forces at foreign stations are being supplied with fresh concentrated milk at their

bases. Clay (14, p. 56) reported considerable use of concentrate on navy vessels leaving U. S. for extended cruises.

In February of 1957, the Pure Milk Association of Chicago began processing and selling fresh concentrated milk at their Kansasville, Wisconsin plant (17, p. 15). Besides the sales being made to a group of stores in northern Illinois and southern Wisconsin, the firm also shipped concentrate to Nicaragua (9, p. 8). In early 1960, however, distribution of fresh concentrate by this firm was terminated because the plant facilities were needed for fluid operations and because trade barriers had prevented increasing operations to a point where the concentrate could be offered at a price less than that of fresh whole milk (42, p. 39).

Several years ago Cache Valley Dairy Association of Smithfield, Utah and the Upper Snake River Dairyman's Association of Idaho Falls both placed fresh concentrated milk on the market in Idaho Falls, Idaho. Price of both concentrates was reported to be about the same per quart equivalent as that on fresh whole milk. Neither product enjoyed any sales success and processing stopped.

Two Canadian firms are reportedly selling fresh concentrated milk to points many miles distant in northern Canada and receiving good consumer acceptance (9, p. 8).

One firm in Minnesota is selling from one to three tank loads of fresh concentrated milk daily to markets as far away as 1200 miles to be made into ice cream (9, p. 8).

Bartlett reported that at least 20 institutions, including private firms and universities, have been engaged in research to develop a sterile concentrated milk or a whole milk powder and that at least three plants for processing it are being built (9, p. 8).

A sterile concentrated milk developed by Dr. E. O. Herreid of the University of Illinois has been put through a taste test in which 43 percent of those drinking fresh milk thought that it was sterile concentrate and 23 percent of those drinking reconstituted sterile thought that the sterile was fresh milk. The sterile concentrate used in this test had been stored in cans for two months at 70 degrees F.

A sterile concentrate has been under development at the University of Wisconsin for several years (24, p. 3; 12, p. 7; 41, p. 3). A recent test showed the following results (24, p. 4):

(a) Sterile concentrate compared favorably with fresh whole milk in color and odor. It was described as somewhat creamier or richer in feeling.

(b) Many judges could not differentiate it from homogenized whole milk when reconstituted and refrigerated overnight. When refrigerated for only an hour, one-half of the judges could identify it as different.

(c) Sterile concentrate which had been refrigerated for three months was found to be quite acceptable. Storage at higher temperatures allowed development of a cooked flavor.

The Maryland and Virginia Milk Producers Ass'n., according to manager W. B. Hooper (10, p. 60), is already selling thousands of gallons of sterile milk to the armed forces and will start producing sterile ice cream and milk shake mixes during 1960.

Major Brands, Inc. of Chicago, is putting out sterile chocolate milk drink, eggnog, and an 8-ounce can of 18 percent table cream through their plant at Corning, Iowa (42, p. 40). Vice-president A. P. Stewart says that the company will be selling sterile concentrated milk in 200 stores by July 1, 1960 (10, p. 60).

Scientists at Michigan State University are working on a method of

cold sterilization of milk by means of an electron beam generator that would fire electrons at milk at high speeds to kill spoilage organisms (15, p. 90).

One branch of the military service has accepted sterile concentrate for use as a beverage after being held under refrigeration for 90 days or in frozen form for 180 days (3, p. 8).

Machines for sterilizing and aseptic packaging of sterile milk or milk products have been set up and are in operation at Fairfield, Iowa; Menomonie, Wisconsin; Saratoga Springs, New York; and Visalia, California (4).

Factors Underlying Consumer Acceptance

Flavor

Results of various taste tests were mentioned in the above section on development. From the many tests that have been made, Froker (24, p. 5) feels it reasonable to conclude that concentrate, when properly handled and reconstituted, is satisfactory in taste to a great many people. At a recent dairy conference, Bay (10, p. 60) reported that some folks noticed a slight nut flavor to the sterile concentrate, but did not object to it. Dairy scientists at the University of Wisconsin (37, p. 1169) admit that at times sterile concentrate has a slight cooked flavor, but feel that as techniques improve, this defect will be eliminated.

Keeping quality

In the case of fresh concentrate, the Navy found that it generally remained in good condition for at least two weeks when refrigerated (39). Another report states that prior to reconstitution, fresh concentrate will

keep for three weeks if kept under 40 degrees F., or several months at below zero temperatures (11, p. 23). After reconstitution, the keeping quality of fresh concentrate is reported to be nine days as compared to seven days for regular milk when both are kept refrigerated (11, p. 23 and 19). Iowa State University attributes this slight advantage in keeping quality to the more drastic heat treatments the concentrate receives as compared to regular pasteurized milk (46, p. 10).

In two tests on sterile concentrate, one where it was held in cans for two months at 70 degrees F. and one where it was held refrigerated for three months, the product was found quite acceptable (16, p. 198 and 24, p. 4). As was mentioned before, the Army has accepted sterile concentrate as a beverage after being held under refrigeration for 90 days or in frozen form for 180 days (3, p. 8). Dr. Calbert of the University of Wisconsin reported that their sterile concentrate was still okay after six months storage at room temperature (37, p. 1169). Under refrigeration, he feels that its freshness is assured much longer, maybe a year or more.

Convenience

Blake (11, p. 24) mentions that concentrated milk has three advantages, convenience wise, over regular milk: (a) it is lighter in weight and easier to carry home from the store; (b) it is more compact, taking up only one-third the refrigerator space; (c) it is more versatile--from one quart of concentrate a housewife could obtain one-half pint of cream plus one pint half-and-half plus one quart of whole milk. He further mentions that mixing one-third glass of concentrate with two parts carbonated beverage makes a rich, creamy soft drink similar to an ice cream soda and equal to a full glass of milk in nutritional value. Froker (24, p. 5)

speaking on concentrate's versatility or flexibility, calls it a 3 in 1 product in both concentration and use. He says that at full concentration, it can be used as coffee or whipping cream, with one part water in it can be served as half-and-half on cereals and desserts, and with two parts water it equals fresh whole milk.

Price

Even with the apparent advantages of concentrate, Myrick (36, p. 12) felt that results in Lima, Ashtabula, Wilmington, Boston, Washington, D.C., Urbana, and wherever the product was tried showed that consumers would not go to the extra work of reconstituting it when they could get regular milk for the same price. Parker and Harris (39), in analyzing the sales decline in these markets, state that at the price relationships prevailing, the advantages of using concentrate could not offset the inconvenience of reconstituting once the consumer's initial curiosity was satisfied.

Bartlett (2, p. 2) refers to sales results in Safeways' California stores as evidence that concentrate sales are directly related to price. In San Francisco, where price of concentrate was three cents below store price of whole milk, sales were around 25 percent of total milk sales in the firm's stores. In Los Angeles, with only a two and one-third cent advantage, concentrate sales were around 15 percent of total milk sales. In the surplus-producing areas of central California, where concentrate enjoyed only a one-half cent advantage, sales were negligible.

The editorial staff of American Milk Review (22, p. 36) has also indicated that price, without question, was the most important factor underlying success or failure in marketing fresh concentrate.

As to how much price advantage concentrate would have to enjoy in

order to sell, agricultural economists in the Dairy Section of Market Organization and Costs Branch, A.M.S., figured a two cent per quart or more savings would be necessary (31, p. 5). One article published in Fortune (45, p. 164) stated that most milk executives agree that concentrate does not stand a chance unless it saves consumers at least three cents per quart. Halverson (37, p. 1177) reported that replies from a survey of Wisconsin families suggest that a two cent price advantage would induce 50 percent of the housewives to substitute fresh concentrate for fluid milk. He goes on to say that at least this differential would be necessary to secure adoption of the sterile concentrate. He does point out, however, that for special uses such as vacations and where refrigeration space is limited sterile concentrate would find some outlets even without a price advantage.

Costs of Concentrate

Price to producers for milk going into concentrate

Dairy scientists of Iowa State University (46, p. 10), Dr. Swanson of the University of Wisconsin (37, p. 1169), Rickens and Thomsen (41, p. 18), and V. H. Nielson (38, p. 66) among others, all seem to feel that only high quality or Grade A milk can be used in concentrate if a high quality product is to be obtained. No feelings to the contrary were found in any of the articles reviewed. At what price this high quality milk will be purchased is still another question. When fresh concentrate first appeared on the market in Boston, it was made from milk bought at surplus prices (45, p. 164). Producers were soon successful, however, in getting the milk used in concentrate reclassified as Class I. Purcell and Herrmann pointed out that although it has been suggested by some that the product

be placed in a lower price class in order to promote its sales, most federal orders provided that fresh concentrate would be a Class I product when and if sold (40, p. 45-46).

Bartlett's opinion on classification of concentrated milk is this:

> In the writer's opinion, fresh concentrated milk originating in a federal-order area should be priced as Class I milk in the market where it originates. If such milk originates in a non-federal-order market and goes to a federal-order market, presumably it would command the Class I price of the federal-order market less actual costs of transporting the concentrate from its point of origin. Amendments to present milk orders would be necessary to effectuate this change, since transportation costs of the fresh concentrate are only one-third those now written into these orders for whole milk.
>
> In the second stage of development, when a high-quality storable, sterile concentrate is marketed, presumably this milk will have the price it commands under competition at the point of origin, and like evaporated milk will be entirely outside of federal-order regulation. (2, p. 5)

On the question of price and classification of milk going into sterile concentrate, answers do not appear so certain. Bartlett makes the assumption that sterile concentrate milk will be made from milk now being sold at manufactured prices (42, p. 41). In another talk, Bartlett (2, p. 3) stated that it is only wishful thinking to assume that milk going into high quality sterile concentrate would command a price materially above manufactured level since such states as Minnesota and Wisconsin have been taking action in recent years to improve the quality of manufactured milk. He goes on to say that if there were any premium, it would only be a fraction of a cent per quart.

Cost of processing concentrated milk

Dairy scientists at Iowa State University estimated the costs of producing fresh concentrated milk when packaged in quart containers under

four different plant situations and nine different levels of output (45, p. 12-16). Average total cost per quart ranged from $0.8322 to $0.0824 depending on the plant situation and level of output. Plant loss calculated at 6 percent of raw milk dumped was included in total cost.

Various estimated costs of concentrating milk as gathered from commercial sources by Ward and Cook (47, p. 20) ranged from $0.23 to $1.72 per hundred pounds of whole milk. Ward and Cook also made some synthetic estimates of concentrating costs using new types of evaporators (47, p. 20-25). The results of their study showed that significant economies of scale existed in concentrating milk. Using the appropriate size of evaporator at each scale of output, the cost ranged from 14 cents per cwt. of whole milk at a rate of 216,000 pounds input of whole milk per day to 89 cents per cwt. at a rate of 6,000 pounds input per day.

Riekens and Thomsen (41, p. 16) of the University of Wisconsin developed processing costs and local delivery costs of concentrated products at three levels of production (table 3). Cost was figured on a per hundred pounds of original milk basis instead of on a per sales unit basis. The fresh concentrate was packaged in one-third quart fiber containers costing $0.0139 each while the sterile concentrate was packaged in one-third quart metal cans (size 211 x 414) costing $0.0303 each, f.o.b. the processing plant. Plant loss of the original milk was considered to be 4 percent, but was reflected in fewer sales units rather than as a cost item.

In 1951, Bartlett (6, p. 1134) reported that receiving, concentrating, bottling and storage costs per quart equivalent of fresh concentrate in Chicago area were 4.00 cents for an efficient operation. In a footnote he stated that the 4.00 cent figure included 1.12 cents for concentrating

Table 3. Cost of processing and delivering fresh or sterile concentrated milk to local outlets as developed by Rickens and Thomsen

Item of expense[a]	Fresh concentrate		Sterile concentrate
	Pounds of original milk daily		
	50,000	100,000	250,000
	Cost per cwt. of original milk		
Labor (0.18 hours at $2.41/hr.)	$0.424	$0.308	$0.181
Receiving costs	0.030	0.024	0.022
Field expenses	0.040	0.040	0.031
Vitamin D concentrate (1c.c/43 pounds of milk at $0.006/c.c.)	0.014	0.014	0.014
Container cost (44.65 containers at $0.0139)	0.621	0.621	1.353
Boxes (0.89 at $0.144)	0.128	0.128	0.128
Supplies	0.051	0.031	0.019
Water (149 gal. at $0.10/1,000 gal.)	0.015	0.015	0.015
Sewage disposal	0.007	0.007	0.007
Electricity (0.62 kwh at $0.02/kwh	0.012	0.012	0.011
Steam (56.3 pounds at $1.45/1,000 pounds)	0.081	0.081	0.081
Refrigeration (0.009 tons at $3.00/ton)	0.027	0.024	0.020
Rental and royalty on aseptic canner			0.045
Equipment depreciation	0.134	0.079	0.065
Equipment maintenance	0.134	0.079	0.065
Building depreciation	0.017	0.009	0.006
Building maintenance	0.017	0.009	0.006
General expenses	0.060	0.038	0.032
Administrative expenses	0.099	0.068	0.042
Total processing cost	$1.911	$1.587	$2.143
Delivery costs (44.65 units at (0.02)	0.893	0.893	0.350[b]
Total processing and delivery cost	$2.804	$2.480	$2.493

[a]Itemization is for the 50,000 pound operation. The 50,000 and 100,000 pound columns are for fresh concentrate packaged in fiber containers. Filling operations in the 250,000 pound plant have been calculated on the basis of the use of metal containers and an aseptic filler. They reflect the use of larger, more expensive equipment. Yields are based upon 44.65 sales units per 100 pounds of original milk.

[b]This cost will vary on the basis of the method of merchandising, frequency of deliveries, and refrigeration requirements.

Source: (41, p. 16)

milk on a three-to-one basis and 2.88 cents a quart for plant operations, including cost of container.

At a later date Bartlett (2, p. 3) made the following comment to a question on whether additional costs of concentrate will discourage its sales:

> The answer to this question is no. One make of paper container that will be used for interstate shipment of this product costs two cents a quart. The cost for packaging three quarts of milk in paper would therefore be six cents. Since two parts of water have been removed, three quarts of whole milk can be packaged as fresh concentrate in a one-quart container at a saving of four cents. Reliable data indicate that, on a volume basis, the total cost of concentrating three quarts of whole milk is slightly less than four cents. Hence costs of processing fresh concentrate can be slightly more than offset by savings in container costs.

In 1959 Bartlett (3, p. 8), regarding fresh and sterile concentrate said:

> Fresh concentrated milk processed in the Midwest can be sold within a 1,000-mile radius for about 2.5 cents a quart more than evaporated milk. Included in the extra cost would be the following items:
>
> 2.15 cents--Difference between Class I price (Chicago) and condensery price.
> 0.50 cent---Extra cost of concentrating on a 3-to-1 basis.
> 0.23 cent---One-third of the difference between gross distributor spread in 1958 for whole milk (10.6 cents) and evaporated milk (9.9 cents).
> 0.65 cent---Extra cost of transportation.
>
> From the total of 3.53 cents would be subtracted 1 cent, which represents the saving in packaging. Thus, the net increase would be 2.5 cents.
>
> Sterile concentrated milk can be processed and sold for about 1 cent a quart more than evaporated milk, including ½ cent for extra costs of concentration and ½ cent for extra quality.

For sterile concentrate, Froker (24, p. 6) said processing costs

will probably be slightly higher than evaporated milk since more water is removed and some equipment will be more expensive. Swanson (37, p. 1169) cited estimates placing processing costs for sterile at $2.93 a hundred pounds as compared to $2.43 for evaporated milk.

Cost of transporting concentrate

The shipping charge from Madison to New Orleans on an amount of product equal to a hundred pounds of original milk was reported by Rickens and Thomsen (41, p. 17) as $0.443 for fresh concentrate, $0.499 for sterile concentrate, $0.6219 for evaporated milk, and $1.50 for whole milk. The average weight of a case of 50 one-third containers was calculated at 41.25 pounds for fresh concentrate and 46.8 pounds for sterile concentrate.

Bartlett (7, p. 12 39) reported that the fresh concentrate which a Chicago firm sold to the Navy at Key West, Florida in 1951 was delivered in a refrigerated truck at a rate of $2.53 per 100 pounds of cargo weight with a minimum of 20,000 pounds. This, he mentioned, came to 6.32 cents per quart of concentrate.

In another article Bartlett (8, p. 22) stated that it would cost 4.0 cents per quart to ship whole milk to Jacksonville, Florida, but only 1.5 cents for an equivalent amount of concentrate. In 1956 he stated that a third-quart of concentrate could be transported in a refrigerated truck a distance of 1,000 miles for one cent (5).

Graf (37, p. 1176) estimated that packaged concentrated milk could be shipped 1,200 miles for about 1.5 cents per quart equivalent, a saving of about three cents per quart equivalent over the transportation cost of bulk fluid milk.

Handling and distribution costs

In the Iowa State University study, where about 750 quarts of concentrate per week were delivered to rural customers on a one-day delivery per week basis, delivery cost was 3.56 cents per quart of milk equivalent or 10.68 cents per quart of concentrated milk (46, p. 12).

Rickens and Thomsen (41, p. 14) considered local delivery cost of fresh concentrate on wholesale operations at $0.02 per third-quart container. They stated that where deliveries are made directly to the consumer, costs will be greater, but should not equal those for whole milk because weights are lower and deliveries can be less frequent. Delivery cost used on sterile concentrate was $0.0078 per third-quart can. This, they said, would vary on the basis of the method of merchandising, frequency of deliveries, and refrigerative requirements.

Mathis (32, p. 9) points out that fresh concentrate would tend to reduce distribution costs only if it was delivered on specialized routes where fewer deliveries were made per week. Deliveries to homes, he said, could be reduced from the present three times per week to one time weekly while deliveries to stores could be made twice weekly instead of daily. As for sterile concentrated milk, he feels that handling, packaging, and distributing costs would approximate two-thirds of the same cost items per quart equivalent as evaporated milk (32, p. 11).

Bartlett (6, p. 1134), in one of his studies on marketing concentrated milk, used 2.0 cents as the cost of selling, loading and unloading fresh concentrate when transported to outer markets.

Ward and Cook (47, p. 18), after analyzing cost studies in New York City, Buffalo, Los Angeles and in Utah and Montana, decided the cost of delivery to stores per quart of fresh concentrate would be about 6.06

cents. This cost assumed that no savings in wholesale distribution would result from concentrated milk. On a quart of whole milk equivalent basis, the cost would appear to be about 2.02 cents.

Store margin on concentrated milk

Mathis (32, p. 9) writes that the amount of possible savings in retail stores through handling fresh concentrate in place of regular milk would depend on services offered by drivers of delivery trucks and by merchandising practices in the stores. Ward and Cook (47, p. 20) estimated store handling charge in Illinois to be 6.0 cents per quart of fresh concentrate or three quart equivalents of whole milk as compared to 7.5 cents for three quarts of whole milk. They felt that the saving of 1.5 cents would be possible because of less need for store space. In California, Safeway Stores reported a reduction in store margin of 1.5 cents per quart of concentrate (47, p. 30).

Retail price

In previous subsections, reference was made to the price at which fresh concentrates had been sold in various markets. In most markets, fresh concentrate was the same price per quart equivalent as regular milk. In California it has sold for two to five cents less. On the Chicago fresh concentrate going to Key West, Bartlett (7, p. 1238) reported the contract delivered price at 51.98 cents per quart. The selling price of regular whole milk at Key West was not mentioned.

Since fresh concentrate has appeared commercially on relatively few markets, and sterile concentrate only experimentally, the probable retail prices of concentrate as compared to regular whole milk on many markets has had to be estimated. In 1951 Bartlett (6, p. 1134) estimated

the price at which fresh concentrate from Chicago would sell for on 12 eastern and southern retail markets and found it to vary from 1.38 cents to 6.26 cents below regular store prices. In 1958 Bartlett (3, p. 8), figuring processing cost of fresh concentrate at 2.5 cents per quart equivalent more than for evaporated, estimated that midwest fresh concentrate could be shipped as far as 1,000 miles and be sold at ". . .6.2 cents a quart less than whole milk in the South; 5.6 cents less than in the Northeast; and 3.9 cents less in the West." In the Midwest, he said, fresh concentrate would sell for about the same price as fresh whole milk. For estimating the price of sterile concentrate, Bartlett used a processing cost of 1.0 cent per quart equivalent above that for evaporated. This, he said,

> . . .would mean that the sterile concentrate could be sold for 7.7 cents a quart less than whole milk in the South; 7.1 cents in the Northeast; 5.4 cents in the West; and 1.7 cents in the Midwest. (3, p. 8)

Along the same line, Froker (24, p. 6) states that the difference between the price of sterile concentrate per quart equivalent and fresh whole milk would be as little as two cents in some markets and as much as eight to ten cents in others, with the largest spread being in some of the southern markets, followed by markets in the western and eastern states.

Swanson (37, p. 1169) stated that, "Surveys show that a plant producing sterile concentrate can put it into stores at about 16 cents a quart." Rickens and Thomsen (41, p. 18) mentioned that it appears a third-quart of fresh concentrate could be sold for 14.5 cents and a third-quart of sterile concentrate for 15.5 cents at the warehouse dock in New Orleans.

Speculations as to the Probable Impact of Concentrated Milk on the Dairy Industry

On the assumptions that concentrated milk can break the trade barriers and that it will have a price advantage, many writers have tried to estimate its impact on the dairy industry.

Froker (24, p. 6-8) concludes that concentrates will tend to narrow the spread between prices paid producers for milk for manufactured products and prices paid for milk going into fluid products. He sees less seasonal stress on prices and less need for the classified pricing system. Fluid milk markets would become less independent and less isolated and more effected by industry-wide conditions of supply and demand. He feels there would be some softening of retail prices for fresh milk and more shift from home delivery to store sales. He also sees some increase in total consumption and a stronger overall market for milk.

Bartlett feels it reasonable to assume that the elasticity of demand for concentrated milk will correspond closely to that of whole milk (3, p. 9). If this holds true, he thinks that the sharp price decreases possible from marketing concentrated milk might result in a 15 to 20 percent increase in per capita sales. In addition to the increased domestic demand, he feels it probable that foreign markets will eventually use substantial quantities of concentrated milk. As to other effects, he says:

> Production could be expected to decline in high-cost areas and increase in low-cost areas. Milk prices to producers in low-cost areas would likely be somewhat higher than they are now. On the other hand, both Class I prices and blend prices, as well as distribution margins, could be expected to decrease sharply in high-cost areas. (3, p. 9)

In a report entitled "The Probable Impact of Milk Concentrate on the Fluid Milk Market", A. G. Mathis (32, p. 1) states that ". . .present evidence does not indicate that concentrated milk will displace a major part of fresh fluid milk." Until sales of concentrated milk reach a volume that is a significant percentage of whole milk sales, he feels that competition would be insufficient to cause a change in whole milk prices. Large volume sales, he points out, could lower producer prices in the higher cost supply areas and force wider use of gallon containers for sale of milk at discount prices.

In another article Mathis (31, p. 6) stated that processing and distribution of concentrate will probably be handled by existing firms. Plants now in operation, he says, already have most of the equipment and facilities needed. New plants would find it expensive to start from scratch and hard to obtain a milk supply, he points out.

Myrick (36, p. 12), writing in 1951, felt that fresh concentrate had great potential for increasing the consumption of milk. If price was lower than for regular milk, he said that it would probably cut into fluid milk sales, but the increase in consumption would presumably give the farmers a higher blend price.

In 1959, Myrick (35, p. 60) stated that local producers, faced with competition from concentrate, would lower prices to meet competition and would also, where milk was being sold on a classified basis, seek a new classification to provide local processors with a supply of milk for concentration at a price competitive with that enjoyed by processors in surplus or manufacturing milk areas. The net effect of all this, he said, would be to lower blend prices in local areas without much change in movement of milk.

Dr. Graf (37, p. 1177) of the University of Wisconsin, when asked the effects of concentrate on producer prices, replied:

> In deficit areas, the more that local production is replaced or threatened with replacement by this type of product imported from surplus areas, the greater the depressing effect on local producer prices. Since the potential transportation savings will approach 3 cents per quart equivalent, it is conceivable that local producer prices in some areas could fall by over a dollar per hundredweight.

Halverson (37, p. 1176) comments that although sterile concentrate would find an outlet in all areas for special uses, the best potential would be in those areas where milk supplies are relatively short, prices high, and the costs for transporting supplemental supplies from surplus areas relatively large.

In an article appearing in Feed Bag (12, p. 9), it was stated that sterile concentrate would broaden markets for dairymen since it could be shipped long distances and marketed entirely through grocery channels. This, the article pointed out, could substantially reduce marketing and distribution costs and cause an equalizing of milk prices in various parts of the country.

Factors Affecting the Marketing of Concentrate

Trade barriers

An article appearing in Wallace's Farmer (29), stated that midwest milk dealers want to broaden their markets but that hundreds of local health regulations now prevent free movement of low priced milk into eastern and southern cities. Mr. Fairchild of the Pure Milk Association reported in a recent conference that his company had not been able to crack a single U. S. Market (10, p. 60). This failure to obtain the

necessary licenses and permits, Fairchild reported, was one of the reasons his company ceased selling fresh concentrate (42, p. 40).

As for trade barriers to movement of sterile concentrate, Dr. Graf (37, p. 1181) stated:

> As yet there are no standards for this product. Since it is sterile at the outset, it probably would be treated as evaporated milk or other canned products which are commercially sterile. This means that it would be uncontrolled by local health authorities. However, local health officers may determine that regulation may be necessary in the public interest. This would be somewhat difficult to do in the case of a sterile product. However, pressures of local producers and plants may stimulate changes in ordinances in some areas. Unless these changes are applied to similar products like evaporated milk, they could be construed as being discriminatory and could easily be challenged in the courts.

Bartlett (2, p. 2) feels that there is no good reason why a high quality sterile concentrate should receive any treatment in interstate commerce different from that given to evaporated milk. A. P. Stewart of Major Brands, Inc., reports that his firm is going to put "evaporated" on their sterile concentrate so that it will qualify in states with minimum price laws (10, p. 60).

As to whether barriers will be broken down to allow shipments of concentrate from low cost areas into new markets, Bartlett (7, p. 1244) feels it is only a matter of time since recent court decisions are favorable. Berde, special assistant attorney general of the state of Minnesota, expressed the view that trade barriers could be and are being surmounted and that concentrated milk could more than hold its own on the market (42, p. 147). He also stated that "We've appropriated $30,000 for the attorney general to break down barriers to milk and milk products from Minnesota." (10, p. 60)

Labor opposition

It was reported that in New Jersey, delivery men refused to handle concentrate for Borden because they were afraid it would mean lower salaries and layoffs (45, p. 164). Other truck drivers resisted the concentrate because they feared the product would encourage the buying of milk in stores at the expense of their jobs (19).

Halvorson (37, p. 1181) said the dairy industry has the obligation to work out with its labor force, methods of adjustment to any new developments having an impact on labor.

CHAPTER III

UTAH CONCENTRATED MILK-POTENTIAL MARKETS AND POSSIBLE COMPETITORS

Movement of milk in the form of concentrate, when and if it occurs, would probably be from areas of surplus supply or low cost production to areas of high cost production or deficit supply. Since surplus milk supplies usually reflect low production costs and deficit milk supplies high production costs, potential markets for concentrate can be determined by studying interregional and intraregional production-consumption balances. Utah's potential markets, therefore, will likely be those areas with relatively smaller milk supplies and likely competing areas will be those with a comparatively greater milk supply. Several of these potential markets as well as possible competitors will be selected for price and cost comparisons. The limited nature of this study prevents a more complete consideration at this time.

Interregional Production-Consumption Balance

All milk

Total milk production figures for states and regions are readily available in government publications. The milk available for human use in one form or another can be estimated by subtracting milk fed to calves from total production. Although total consumption figures for states and regions are not published, an estimate of consumption can be obtained by

multiplying a state or region's population times the United States average per capita consumption for the year in question.

When milk consumption is compared to milk available for use (table 4), the East North Central and West North Central are the only regions with a surplus of milk over total consumption needs. They have such a surplus, however, that they not only equalize the deficits in the other four regions, but give the nation as a whole a surplus of some two billion pounds. It is interesting to note that these two regions alone provide about 52 percent of the total milk supply in continental United States while containing only about 29 percent of the population. In comparison, the West, with only one less state, provides 12 percent of the milk while containing 15 percent of the population.

Grade A milk

The total fluid milk supply in selected states was estimated by adding together milk retailed by farmers as fluid milk and cream, milk consumed on farms, and Grade A milk received at dairy plants. Consumption of fluid milk was estimated by multiplying the state's population times 345 pounds, the United States average per capita consumption of fluid milk and cream in 1958 (see table 5 for reference).

All four states selected in the North Central Region showed a surplus of Grade A milk over fluid requirements (table 5). The total surplus of these four states was 7,663 million pounds, while the total surplus of the nine selected Western states was only 1,858 million pounds. Wisconsin's estimated surplus of high quality milk alone was 7,118 million pounds. Along this same line, a survey of 124 dairy cooperatives in three north central states found that while 44 percent of the producer receipts was Grade A, less than half was utilized in fluid products (21).

Table 4. Estimated milk surplus or deficit in selected states and regions, 1958

State	Population[a]	Milk supply[b]	Estimated consumption[c]	Surplus	Deficit
	1,000 persons	Million pounds	Million pounds	Million pounds	Million pounds
West:					
Montana	688	483	477	6	
Idaho	662	1,524	459	1,065	
Wyoming	320	199	222		23
Colorado	1,711	816	1,187		371
N. Mexico	842	220	584		364
Arizona	1,140	406	791		385
Utah	865	726	600	126	
Nevada	267	89	185		96
Washington	2,769	1,837	1,922		85
Oregon	1,773	1,087	1,230		143
California	14,337	7,442	9,950		2,508
Total or average	25,374	14,829	17,607		2,778
W. N. Central					
Minnesota	3,375	9,549	2,342	7,207	
Iowa	2,822	5,997	1,958	4,039	
Missouri	4,271	3,738	2,964	774	
N. Dakota	650	1,692	451	1,241	
S. Dakota	699	1,427	485	942	
Nebraska	1,457	2,041	1,011	1,030	
Kansas	2,116	1,995	1,468	527	
Total	15,390	26,439	10,679	15,760	
E. N. Central					
Ohio	9,345	5,259	6,485		1,226
Indiana	4,581	3,631	3,179	452	
Illinois	9,889	4,961	6,863		1,902
Michigan	7,866	5,368	5,459		91
Wisconsin	3,938	17,402	2,733	14,669	
Total	35,619	36,621	24,719	11,902	
S. Central	28,484	13,771	19,768		5,997
N. Atlantic	43,041	21,610	29,870		8,260
S. Atlantic	25,352	9,075	17,594		8,519
U. S. Total	173,260	122,345	120,237	2,108	

[a] U. S. Bureau of the Census

[b] Total milk production on farms less milk fed to calves. Source: Agricultural Marketing Service

[c] Population times 694 pounds, the U. S. average per capita consumption of milk in 1958. Source: Agricultural Marketing Service

Table 5. Estimated surplus or deficit of Grade A milk, selected states, 1958

State	Received at dairy plants	Retailed by farmers[a]	Consumed on farms[a]	Total	Population[b]	Estimated consumption[n]	Estimated surplus	Estimated deficit
	mil. lbs.	mil. lbs.	mil. lbs.	mil. lbs.	1,000 persons	mil. lbs.	mil. lbs.	mil. lbs.
Idaho	219[c]	19	72	310	662	228	82	
Wyoming	60[d]	6	25	91	320	110		19
Colorado	552[e]	20	67	639	1,711	590	49	
New Mexico	175[f]	12	27	214	842	290		76
Arizona	381[f]	7	15	403	1,140	393	10	
Utah	419[g]	5	40	464	865	298	166	
Nevada	78[f]	1	4	83	267	92		9
Oregon	577[h]	32	84	693	1,773	612	81	
California	5,831[i]	575	114	6,520	14,337	4,946	1,574	
Wisconsin	8,098[j]	30	349	8,477	3,938	1,359	7,118	
South Dakota	180[k]	14	89	283	699	241	42	
Kansas	797[l]	45	155	997	2,116	730	267	
Nebraska	580[m]	21	138	739	1,457	503	236	

See footnotes on following page.

[a]Source: Supplement for 1959 to Dairy Statistics, A.M.S., U.S.D.A., June 1960.

[b]Source: U. S. Bureau of the Census

[c]Source: Idaho Dairy Production, 1958, published by U.S.D.A. and State of Idaho Department of Agriculture

[d]Source: Figure obtained from Charles L. Ankeny, Assistant State Statistician, Cheyenne, Wyoming

[e]Since no figure was obtained for fluid milk, the 552 million pounds represents all milk sold to plants and dealers. A figure representing just grade A milk would be somewhat smaller. Source: See (a) above.

[f]Since most of the milk sold in these states is A grade, no attempt was made to obtain figures other than those representing all milk sold to plants and dealers. Source: See (a) abov e.

[g]Source: Utah 1958 Annual Dairy Report, published by office of Agricultural Statistician, Salt Lake City, Utah

[h]Estimated from figures provided by R. B. Hile, Agricultural Statistician in Charge, Portland, Oregon

[i]Source: California Dairy Industry Statistics for 1959, Special Publication No. 280, California Crop and Livestock Reporting Service, Sacramento, California.

[j]This figure represents 45 percent of the total milk produced on farms in 1958. 45 percent figure was obtained from Hugh L. Cook of the University of Wisconsin. For total milk produced on Wisconsin farms, see (a) above.

[k]Source: Figure was obtained from Ralph O. Felberg of South Dakota State College of Agriculture, College Station, South Dakota.

[l]This figure represents 63 percent of the milk sold to plants and dealers; 63 percent figure obtained from State Statistician, Kansas Crop and Livestock Reporting Service, Topeka, Kansas. For milk sold to plants and dealers, see (a) above.

[m]Represents all milk sold to plants and dealers. No figure for Grade A was available. Source: See (a) above.

[n]Population times 345 pounds, the United States average per capita consumption of fluid milk and cream in 1958. Source: Agricultural Marketing Service

All this indicates that states of the North Central Regions have surplus milk which could find its way into western markets. Although historically much of this surplus milk has been exported in the form of manufactured products, some is now entering Wyoming and Colorado as fluid milk. With fresh and sterile concentrate, the penetration of midwestern milk into western markets could become much deeper.

Production-Consumption Balance within the West

All milk

Although Table 4 indicates that the Western Region as a whole would need to import close to three billion pounds of milk to meet its needs, three states out of the eleven have surplus production. These are Montana, Idaho and Utah. Idaho's surplus is by far the largest, being over 900 million pounds above second place Utah and over 1 billion pounds above Montana. A considerable part of the surplus in these three states, especially Utah and Idaho, would likely be exported to surrounding states in the form of manufactured products. Among the western states who would need to import milk or milk products, California would rank highest. Arizona, Colorado, and New Mexico also have large deficits.

Grade A milk

Only three of the nine western states shown in Table 5 reflect a deficit of Grade A milk. These are Wyoming, New Mexico and Nevada. If better figures were available for milk delivered to plants and dealers, two other states, Colorado and Arizona, could end up with deficit Grade A production. The 552 million pounds of Colorado and the 381 million pounds of Arizona represent total milk delivered to plants and dealers regardless

of grade. Figures representing only Grade A milk could be enough lower to make both states deficit. In both cases, Grade A milk would probably have to be imported anyway because a surplus of some 10 to 15 percent is usually needed to meet the fluctuating day to day demands.

California's Grade A surplus of some 1.5 billion pounds is the largest in the Western Region. Utah follows in second place with 166 million pounds of surplus Grade A milk, and Idaho third with 82 million pounds surplus. On a surplus per capita basis, however, California would trail both Idaho and Utah. Oregon's surplus appears not excessive.

Potential Markets for Utah Produced Fresh or Sterile Concentrate

From the production-consumption figures, the most likely markets for Utah produced fresh or sterile concentrate appear to be New Mexico, Wyoming, Nevada, Arizona, and Colorado. Although Utah is presently selling considerable fluid milk in Southeastern Idaho, Idaho's large over-all surplus of milk does not suggest that Utah concentrate sales would reach any sizeable proportion there.

California, although apparently a large importer of manufactured dairy products, has more than a sufficient quantity of Grade A milk to meet present fluid needs. Because of the rapid population growth which may change the supply-consumption picture in California, it will be considered as a potential market.

Any market for Utah produced concentrate outside of the Western Region appears unlikely. The great surplus of milk in the midwestern states would undoubtedly discourage any intrusion.

Possible Competitors with Utah Milk on Western Markets

From the West North Central Region

With the advent of concentrated milk, it appears likely that the surplus producing states of the West North Central Region might attempt to make greater inroads on western markets. Because of their closeness, the most likely states appear to be Kansas, Nebraska, and South Dakota. At least one and perhaps two of these states are already competing with Utah in Wyoming and Colorado. Since Kansas appears to have the larger surplus of Grade A milk out of the three states, it was selected to represent this region as a possible supplier of both fresh and sterile concentrate to western markets.

From the East North Central Region

Although most of the surplus milk of the East North Central Region has been going into eastern urban centers in the form of manufactured products, the possibility now exists that concentrate, especially sterile, might come from this region into the West. Because Wisconsin is the principal milk producing state of the country, it will be considered in this study as a possible supplier of concentrate to western markets.

From Within the Western Region

From states within the West, Utah would most likely receive competition (other than local), from California and Idaho. California has sufficient Grade A milk for use in concentrate. In this form it would probably bring a higher return than in manufactured products. As before mentioned, fresh concentrate is already on the market in California, and plants for sterile processing are being set up.

In Idaho, although the surplus is mostly of manufacturing grade, any trend toward Grade A production (such as might come if a market appeared for fluid products) could make the state a definite competitor with Utah on markets in Nevada, Wyoming, and even in Utah itself.

In Nevada, because of the deficit of both grades of milk and comparatively low production, it appears unlikely that sterile concentrate of local origin would be placed on the market to compete with Utah concentrate. Only the possibility of a locally produced fresh concentrate will be considered.

CHAPTER IV

COSTS OF CONCENTRATE

Dealer's Buying Price for Milk Going into Concentrate

Fresh concentrate

The grade of milk which should be used in concentrate has been the topic of much discussion (see Chapter II). In fresh concentrate, the general agreement seems to be that only high quality or Grade A milk can be used if a satisfactory product is to be obtained. The price at which this milk must be bought, however, is still another question. In most state or federally regulated markets, milk used in fresh concentrate has been placed in the same price class as milk going into other fluid milk products. This practice will likely continue. In milksheds where a standard classified pricing system is not in effect, however, a processor might not have to pay any higher price for Grade A milk used in fresh concentrate than the going flat rate. This flat rate or average price would generally be lower than what a Class I price would be. Actually, any return from concentrate above that for surplus milk used in manufactured products would accrue to the benefit of the processor and possibly to the producer in the form of a higher rate or average price for his milk.

The dealer's buying price for milk for fluid use was obtained for cities in each of the states selected in the preceding section as potential markets or possible competitors (table 6). In some cases, the particular city was selected not because it would necessarily be the most

potential market or supplier in the state, but rather because price data were readily available. Cities in two areas of Utah were considered because of the difference in buying price for milk.

Table 6. Dealers' buying price for milk for fluid use and estimated cost of milk in a quart equivalent of whole milk and fresh concentrate, selected cities, 1959

City	Buying price for 3.5% B. F. milk per cwt.[a]	Cost of milk in a quart of whole milk[b]	Cost of milk in quart equivalent of concentrate[c]
		cents	cents
Boise	$4.61	10.06	10.33
Denver	5.76	12.57	12.90
Albuquerque	5.75	12.55	12.88
Phoenix	5.33	11.64	11.94
Salt Lake City	5.25	11.46	11.76
Logan (Utah)	4.20	9.17	9.41
Las Vegas	5.60	12.22	12.54
Los Angeles	5.25	11.46	11.76
Wichita	4.63	10.11	10.37
Madison (Wisconsin)	4.03	8.80	9.03

[a]The Salt Lake City price of $5.25 is the November 1959 Federal Order Class I price. Las Vegas price was obtained from Miss Mabel Hartley of the University of Nevada. The Logan price represents about the average price received by producers in Cache Valley for milk used in fluid products. All other prices are simple averages of monthly prices reported in Fluid Milk and Cream Report.

[b]Dealers' buying price per cwt. divided by 45.81, the yield in quarts of whole milk after a 1.5 percent plant loss of the original milk.

[c]Dealers' buying price per cwt. divided by 44.65, the yield of concentrate in quart equivalent after a 4.0 percent plant loss of the original milk.

Sterile concentrate

Since with sterile, more than with fresh concentrate, there is a question as to cost of the raw product, this study will consider two types of sterile concentrate: (a) a product made from Grade A milk bought at the fluid price (table 6) and (b) a product made from high

quality milk bought at condensery price (table 7). The condensery price will be used in the latter case because it usually reflects a slight premium for quality over the regular price of manufacturing grade milk.

Because little manufacturing grade milk is sold in Nevada, Arizona, and New Mexico, the assumption is made that only the higher priced Grade A milk will be used, if any processing of sterile concentrate takes place at all.

Table 7. Average condensery price and estimated cost of milk in a quart equivalent of concentrate, selected states, 1959

State	Condensery price per cwt. for 3.5% milk[a]	Cost of milk in quart equivalent of concentrate[b]
	dollars	cents
Idaho	3.09	6.92
Colorado	3.00	6.72
Utah	3.00	6.72
California	3.18	7.12
Kansas	2.98	6.67
Wisconsin	3.07	6.88
Nevada	--	--
Arizona	--	--
New Mexico	--	--

[a]Except for Colorado, figures are the simple average price calculated from statistics reported in Evaporated, Condensed, and Dry Milk Report. Colorado price represents an eight cent premium over the 1959 average manufacturing grade price as computed from Agricultural Prices--1959 Annual Summary. In Arizona, Nevada, and New Mexico no significant quantity of manufacturing grade milk is sold.

[b]Condensery price per cwt. divided by 44.65, the yield of concentrate in quart equivalents after a 4.0 percent plant loss of the original milk.

Cost of Processing and Packaging Concentrated Milk

Type of plants which will process concentrate

The high fixed investment necessary in setting up a new plant to process concentrate and the large volume of sales then necessary for economic operations would tend to encourage the processing of concentrated milk in plants already possessing most of the needed facilities and equipment. Concentrated milk, at least until established on the market, would likely be added to existing milk processing businesses. In this way, concentrate would share fixed expenses with other milk products.

In most of the western states, the most likely future processors of fresh concentrate appear to be those who are presently packaging fluid milk products in large quantities and who have an excess of Grade A milk. In Utah some of the larger plants already have evaporators, although perhaps not conveniently located for use in fluid operations. One plant has already processed fresh concentrated milk for sale. In California and the Midwest, where population is greater and milk surplus larger, it appears conceivable that some large volume specialized plants might be set up to process and market concentrate in a more extensive manner.

In the case of sterile concentrate, it appears likely that evaporated milk plants will be among the first to process the product. Such plants would already have most of the needed equipment and, because of the declining consumption per capita of evaporated milk in recent years, the excess capacity to handle the product. Here again concentrate would be sharing fixed costs with other products. If sterile concentrate is found to be an acceptable product, it is conceivable that it will eventually

push evaporated milk off the market. This would leave evaporated milk plants with unused capacity which might be profitably used in production of sterile concentrate.

Cost of processing and packaging fresh concentrate

Several reported costs of processing and packaging fresh concentrate were reviewed in Chapter II. Because of the greater detail in the cost study by Riekens and Thomsen, their costs were selected for use in this study (see table 3). Since they developed their costs in 1956, however, an adjustment was made in the cost figures for the increase in costs since that year. According to a publication by the United States Department of Agriculture entitled Milk Distributors' Sales and Costs, the average total cost of operations for certain selected dairy firms increased from $4.68 in 1956 to $4.89 in 1959 per cwt. of milk and cream processed (30, p. 5). This was an increase in cost of 4.06 percent. Assuming the same increase in costs for fresh concentrate, the figures of Riekens and Thomsen (as shown in table 3) would now be:

Pounds of original milk daily	50,000	100,000
Total processing cost per cwt.	$1.989	$1.651
Cost per third-quart of concentrate	4.45 cents	3.70 cents

When fresh concentrate is packaged in quart containers instead of third-quart, Riekens and Thomsen said their cost estimates (as shown in table 3) would be reduced $0.320 per cwt. of original milk because of a savings in container cost and $0.03 per cwt. because of a savings in labor (41, p. 18). The new figures would be $1.551 and $1.263 per cwt. for the 50,000 and the 100,000 pound volumes respectively. After adjusting these costs upward by 4.06 percent to compensate for increased costs since 1956, the new figures would be:

Pounds of original milk daily	50,000	100,000
Processing cost per cwt.	$1.624	$1.324
Cost per quart of concentrate	10.91 cents	8.90 cents
Cost per quart equivalent of concentrate	3.64 cents	2.97 cents

The figure of 3.64 cents will be used in this study for the cost of processing and packaging concentrated milk in each of the supplying areas. Although 50,000 pounds daily might be more milk than many plants would ever process into concentrate, near the same costs should result as long as this amount of milk is being run through the plant and the facilities are being used to process other products.

Cost of processing sterile concentrate

The cost of processing sterile concentrate is often compared to that for evaporated milk. This is because sterile concentrate would not only require much the same equipment, but would possibly be produced in the same plant. The cost of producing evaporated milk in a mid-western plant receiving over 300,000 pounds of milk daily was reported by Riekens and Thomsen (41, p. 20) as being $2.0887 per hundred pounds of original milk. Yield (after losses) per hundred pounds of original milk was 1.058 cases of forty-eight 14½ ounce cans. This would make the processing cost of $0.0411 per 14½ ounce can. Since it takes 1.07836 cans of evaporated milk to make one quart equivalent of whole milk, the cost per quart equivalent would be $0.044. According to Bartlett (see Chapter II), the extra cost of processing sterile as compared to evaporated was about one-half cent per quart equivalent. This added on the $0.044 would make $0.049 as the processing per one-third quart of sterile concentrate.

Riekens and Thomsen of the University of Wisconsin came up with a processing cost for sterile concentrate of $2.143 per hundred pounds of original milk in a plant receiving 250,000 pounds of milk daily (see table 3). At a yield of 44.65 sales units per hundred pounds of original milk (4% milk loss) the volume would be 111,625 third-quart cans of concentrate daily at a cost of $0.0480 each. This figure and the $0.049 figure of the preceding paragraph are very close and would tend to substantiate each other.

The processing cost figures of $2.93 per hundred pounds for sterile and $2.43 for evaporated as cited by Dr. Swanson are somewhat higher, however, than those used by Riekens and Thomsen. The quart equivalent costs in this case would be $0.0656 for sterile and $0.0516 for evaporated. This difference of $0.014 would be substantially higher than Bartlett's $0.005.

To compensate for the increase in prices since 1956, when Riekens and Thomsen developed their costs, the $2.143 figure was adjusted upward by 4.06 percent as were the cost figures for fresh concentrate. The processing cost of sterile concentrate for this study was therefore assumed to be $2.230 per hundred pounds of original milk or 4.99 cents per quart equivalent (assuming a yield of 44.65 quart equivalents).

Transportation Costs for Concentrate

Fresh concentrate

It appeares that fresh concentrated milk will be transported or shipped in the same manner as fresh whole milk; i.e., in insulated bulk tanks or refrigerated vans owned by the processing firm. Concentrate

shipped in bulk could be packaged as concentrate at the destination or perhaps even be reconstituted as whole milk, and then packaged. In the case where a dealer is looking for or trying to compete on new markets, however, the packaging would likely be done at the point of origin. With the latter situation in mind, several Utah firms transporting milk and milk products in refrigerated vans on long runs were consulted on costs. With the help of these firms, itemized expense figures were developed. Average total cost per mile was found to be 27.7 cents when total mileage during the year was 125,000 miles (table 8).

Unit cost figures for use in this study were obtained by multiplying the round trip miles between selected origins and western markets by 27.7 cents and then dividing by the number of sales units in a 40,000 pound load (table 9). Even though the full 40,000 pounds might not be composed entirely of concentrate, the cost would remain the same if other products (such as whole milk, cream, cottage cheese, etc.) paid their proportionate share.

The assumption was made that the vans would return empty. Actually some firms have been able to reduce cost of transporting milk through a return haul of plant supplies or other products. Because such cost reducing "back-hauls" are uncertain as to frequency and quantity, no consideration was made as to their effect on hauling costs.

It is interesting to note from the figures in table 9 the savings which would result from shipping concentrated milk instead of whole milk. Since a quart equivalent of fresh concentrate is the same as a quart of whole milk, the savings would roughly be the difference between the two columns. Shipping concentrate from Salt Lake to Denver, for example,

Table 8. Itemized costs of purchasing and operating a diesel tractor and refrigerated van on long haul deliveries of milk totaling 125,000 miles per year, 1960

Item or description		Cents per mile
Original investment:	$20,000 tractor 15,000 van $35,000	
Fixed costs:		
Depreciation: tractor @ 12½% straight line	$2,500	
van @ 10% straight line	1,500	
Interest on capital: @ 6%	2,100	
Insurance:	2,000	
Taxes:	400	
Licenses:	1,500	
Total fixed costs	$10,000	
Cost per mile		8.0
Variable costs:		
Fuel and fuel tax:	6.00 cents per mile	
Oil:	0.31 " " "	
Tires:	2.38 " " "	
Repair and maintenance:	3.00 " " "	
Total variable cost per mile:		11.7
Driver's wages:		
2 drivers @ $2.40 per hour = $4.80 per hour		
$4.80 x 2080 working hours per year = $9,984.00		
Driver's cost per mile:		8.0
Total cost per mile:		27.7

Source: Most figures were developed through consultation with several Utah dairy firms. Oil, tire, and repair and maintenance costs were obtained from a study made by Roberts and Grover, Transportating Utah Cattle by Truck, Utah Agricultural Experiment Station, Bulletin 417, November, 1959.

Table 9. Cost of transporting packaged fresh concentrated milk in a refrigerated van, selected origins and destinations, 1960

Origin and destination	Round trip miles[a]	Total cost at 27.7 cents per mile[b]	40,000 lb. load	
			Cost per quart[c]	Cost per qt. equiv.[d]
			cents	cents
Salt Lake City to Denver	1030	$285.31	1.71	0.57
to Las Vegas	902	249.85	1.50	0.50
to Los Angeles	1484	411.07	2.47	0.82
to Phoenix	1480	409.96	2.46	0.82
to Albuquerque	1260	349.02	2.09	0.70
Logan to Denver	1198	331.85	1.99	0.66
to Las Vegas	1070	296.39	1.78	0.59
to Los Angeles	1652	457.60	2.75	0.92
to Phoenix	1648	456.50	2.74	0.91
to Albuquerque	1428	395.56	2.37	0.79
to Salt Lake City	168	46.54	0.28	0.09
Boise to Denver	1760	487.52	2.92	0.98
to Las Vegas	1372	380.04	2.28	0.76
to Los Angeles	1788	495.28	2.97	0.99
to Phoenix	2238	619.93	3.72	1.24
to Albuquerque	2140	592.78	3.56	1.19
to Salt Lake City	764	211.63	1.27	0.42
Madison to Denver	1940	537.38	3.22	1.07
to Las Vegas	3840	1063.68	6.38	2.13
to Los Angeles	4284	1186.67	7.12	2.37
to Phoenix	3520	975.04	5.85	1.95
to Albuquerque	2660	736.82	4.42	1.47
to Salt Lake City	2960	819.92	4.92	1.64
Wichita to Denver	1038	287.53	1.72	0.58
to Las Vegas	2480	686.96	4.12	1.37
to Los Angeles	2824	782.25	4.69	1.56
to Phoenix	2108	583.92	3.50	1.17
to Albuquerque	1296	358.99	2.15	0.72
to Salt Lake City	2046	566.74	3.40	1.13
Los Angeles to Salt Lake City	1484	411.07	2.47	0.82
to Las Vegas	496	137.40	0.82	0.28
to Phoenix	782	216.62	1.30	0.43
to Albuquerque	1602	443.76	2.66	0.89

[a] As figured from road maps

[b] See table 8 for details of cost.

[c] Total cost divided by 16,667 quarts. Weight of a case of 20 quarts of concentrate estimated at 48 pounds: (40,000 - 48 = 883.3 cases; 883.3 x 20 = 16,667 quarts). Although there would be some variance, the weight of a quart of whole milk is assumed to weigh the same as a quart of concentrate.

[d] Cost per quart of concentrate divided by three, the number of quart equivalents

would result in a saving of 1.14 cents per quart equivalent or about two-thirds the cost.

Sterile concentrate

The transportation and distribution methods envisaged for sterile concentrate is much the same as those for evaporated milk. At present, evaporated milk usually moves in carload lots either by rail or truck to wholesalers or jobbers who handle the distribution to retail stores. Consultation with rate clerks of a railroad company and a commercial trucking firm indicated that the rates for sterile concentrate would be the same as those for evaporated milk. Unit cost figures per third-quart can of sterile concentrate, therefore, were obtained by dividing the rail rates for evaporated milk from various origins to selected western markets by the number of cans per hundred pounds of packaged weight (table 10).

Commercial truck rates would probably be a bit lower than rail rates for the shorter hauls, and slightly higher on the long hauls. The rail rates were used because they were more readily available.

On a quart equivalent basis, the cost of shipping sterile concentrate will be slightly lower than for evaporated milk because of the greater amount of water removed.

Cost of Distributing and Selling Concentrated Milk

Distribution cost of fresh concentrate

Since fresh concentrate will be marketed in much the same manner as fresh whole milk, the distribution costs will also likely be similar. This would especially be so if concentrated milk were distributed along

Table 10. Rail rates for evaporated milk and estimated transportation cost per can of sterile concentrate, selected origins and destinations, 1959

Origin and destination	40,000 lbs. minimum	
	Evaporated milk rate[a]	Cost per can of concentrate[b]
	cents per cwt.	cents
Logan or Salt Lake City to Denver	74	0.69
to Las Vegas	61	0.57
to Los Angeles	92	0.86
to Phoenix	105	0.98
to Albuquerque	118	1.10
to Salt Lake City	17	0.02
Boise, Idaho, to Salt Lake City	51	0.48
to Denver	103	0.96
to Las Vegas	73	0.68
to Los Angeles	112	1.05
to Phoenix	120	1.12
to Albuquerque	147	1.38
Madison, Wis., to Salt Lake City	156	1.46
to Denver	94	0.88
to Las Vegas	182	1.70
to Los Angeles	182	1.70
to Phoenix	182	1.70
to Albuquerque	113	1.06
Wichita, Kansas, to Salt Lake City	116	1.09
to Denver	66	0.62
to Las Vegas	172	1.61
to Los Angeles	172	1.61
to Phoenix	172	1.61
to Albuquerque	78	0.73
Los Angeles to Salt Lake City	85	0.80
to Las Vegas	50	0.47
to Phoenix	53	0.50
to Albuquerque	133	1.25

[a] Source: Union Pacific Railroad, Dec., 1959.

[b] Rate divided by 106.8, the number of cans per 100 pounds. Sterile concentrate is reported to weigh 46.8 pounds per case of 50 cans. 100 ÷ 46.8 = 2.137 50 cans x 2.137 = 106.8 cans per 100 pounds.

with packaged whole milk as is likely to be the case until sufficient sales volume of concentrate develops to warrant specialized distribution.

Several studies have been made which point out that wholesale delivery cost decreases with size of delivery. In a Minneapolis study referred to by Mathis (32, p. 8), the following costs were cited:

Size of delivery	Cost per quart of milk
10 quarts	10.64 cents
30 quarts	3.84 cents
50 quarts (average delivery)	2.48 cents
150 quarts	1.12 cents

A recent study in Los Angeles (23, pp. 30, 31) likewise showed that unit costs decrease rapidly with increases in volume delivered. The following are a few of the delivery costs mentioned:

Volume per stop	Delivery cost per unit
10 quarts	6.40 cents
50 quarts	2.30 cents
100 quarts	1.74 cents
125 quarts (average delivery)	1.60 cents
150 quarts	1.52 cents

In a 1953 study by Allred and Ward (1, p. 19), the delivery cost per quart of whole milk equivalent averaged 1.73 cents in Montana and 2.37 cents in Utah. When the two states were averaged together, the cost was 2.12 cents per quart. Although no mention was made in the study as to the average volume or size of delivery, it would undoubtedly have been less than 50 quarts.

Several estimated costs of distributing fresh concentrated milk were reviewed in Chapter II. The average cost seemed to be around two cents

per quart equivalent of whole milk. This cost of two cents compares quite closely with the cost of distributing a quart of whole milk shown in the above mentioned studies when size of delivery was between 50 and 100 quarts. Apparently, the writers who made these estimates considered that the distributing costs of fresh concentrate per quart of whole milk equivalent would be much the same as the costs of distributing a quart of whole milk.

Assuming an average milk equivalent volume of 40 to 50 quarts per wholesale delivery, a cost of 2.5 cents per quart equivalent appears to be fairly realistic and will be used as standard in all markets considered in this study except Los Angeles. Delivery cost in Los Angeles will be the 1.60 cents per quart equivalent shown as average in the above study (23).

Retail markup of fresh concentrate

The retail markup or store margin on selected western markets for packaged whole milk ranged from 2 to 3 cents per quart (see table 14). Now the question is whether the retail markup on fresh concentrated milk will be the same per quart equivalent. In other words, will the same stores accept a product which will tend to displace sales of whole milk at a 3 to 1 ratio without a compensating markup? If not, then the retail markup per third-quart of concentrate would be between two and three cents while the markup per quart of fresh concentrate would be six to nine cents.

Ward and Cook reported that Safeway Stores, Inc., were able to decrease their store margins on concentrate by 1.5 cents per quart (see Chapter II). Such a saving appears reasonable in that fewer items would

be handled and less store space would be required per quart equivalent. The retail margins on fresh concentrate to be used in this study will, therefore, be 0.5 cents (1.5 cents divided by 3) per quart equivalent lower than on packaged whole milk (table 11).

Table 11. Retail markup on packaged whole milk and estimated markup on fresh concentrate per quart equivalent, selected markets, 1959

City	Retail markup	
	Whole milk[a]	Fresh concentrate[b]
	cents per quart equivalent	
Salt Lake City	2.5	2.0
Denver	2.5	2.0
Las Vegas	3.0	2.5
Los Angeles	2.0	1.5
Albuquerque	3.5	3.0
Phoenix	2.5	2.0

[a]Figures represent the mode markup per half gallon of whole milk divided by two. Source: Fluid Milk and Cream Report.

[b]Estimated at 0.5 cents per quart equivalent less than that on packaged whole milk. See text for discussion.

Sterile concentrated milk

The distribution method proposed for sterile concentrate is much the same as that of evaporated milk; i.e., manufacturer to wholesaler to retail food stores. In fact, the cost of distributing a can of sterile concentrated milk would probably be similar to that for a can of evaporated milk of the same size. Because more water is removed, sterile concentrate would therefore probably have a slightly lower distribution cost per

quart of whole milk equivalent than evaporated milk. Mathis suggested that the handling and distribution costs of sterile might even approximate two-thirds the same cost items for evaporated milk (see Chapter II). This assumption, however, will not be made in this study.

Manufacturers' average monthly selling prices per case of evaporated milk were found in Evaporated, Condensed and Dry Milk Report. By averaging these prices over a year and dividing by 48, the number of cans in a case, an average manufacturers' selling price of 13.31 cents per can was obtained for South Western United States and 13.23 cents for North Western United States. When these prices are subtracted from retail prices, the remainder should represent the wholesale and retail margin (see table 12). These same margins will be used per can of sterile concentrate in establishing a possible retail price. After the distribution of sterile concentrate becomes widespread, the wholesale-retail margin could become slightly less as suggested by Mathis.

Table 12. Retail price, manufacturers' average selling price, and estimated wholesale and retail margin per 14½ ounce can of evaporated milk, selected states, 1959

State	Retail price per can[a]	Manufacturers' average selling price per can[b]	Wholesale-retail margin per can
	cents	cents	cents
Idaho	16.60	13.23	3.37
Colorado	16.20	13.31	2.89
New Mexico	16.20	13.31	2.89
Arizona	16.05	13.31	2.74
Utah	16.55	13.31	3.24
Nevada	16.60	13.31	3.29
California	15.40	13.31	2.09

[a] Simple average of the two prices reported for each state in Agricultural Prices--1959 Annual Summary, A.M.S., U.S.D.A., Washington, D. C.

[b] Simple average of the monthly quotations per case divided by 48.

Source: Evaporated Condensed and Dry Milk Report, A.M.S., U.S.D.A., Washington, D. C., 1959

CHAPTER V

COMPARATIVE PRICE POSITION OF CONCENTRATE ON WESTERN MARKETS

The success of concentrated milk on western markets will depend, to a large extent, on the price differential below whole milk at which it can be offered to the consumer. Market results to date indicate that at least a two cent differential per quart equivalent would be necessary for fresh concentrate. Some writers feel that a three cent differential would be needed to gain consumer acceptance. There are no market tests which indicate at what differential below the price of whole milk sterile concentrate would find consumer acceptance, but it would likely be between the differential needed for fresh concentrate and the differential for evaporated milk, which is about six to seven cents per quart equivalent.

By summing up the costs of concentrate as developed in Chapter IV, it is now possible to make comparisons on each of the selected markets which will show the relative competitive position of each of the supplying areas and the margins which would be left for discounting and profit. The cost of placing packaged whole milk on these markets has also been presented so that profit margins on concentrate can be compared to those on whole milk. Although the buying price for milk and transportation are the only costs which vary between supplying areas, other constant costs were added in so that the analysis would show if the margin above cost on concentrate was sufficient for discounting necessary to induce

consumption. The reader should keep in mind that as costs vary from those used in this study, the results will be altered.

In the tables and following analysis, sterile concentrate I refers to a product made from milk at condensery prices. The next to the last column of figures in each of the tables represents the margin left for possible discount, profit, and above normal selling costs which might be necessary in establishing sales on new markets. These margins were obtained by subtracting the total estimated cost of placing the given product on the market from the average store retail price per quart of packaged whole milk. In the last column of each table, the competitive rank or position of each of the supplying areas is indicated by a number: 1 equals best, 2 equals second best position, etc. Efficient processors (medium to large volume) were assumed in all comparisons.

The reader should remember that although one area may be in a better competitive position than another area, competition may never develop because of trade barriers. It would be reasonable to conclude, however, that if a surplus milk area could place concentrate on a market at a substantial profit, more money and effort would be spent in an attempt to break down trade barriers that exist. Even with present trade barriers, sterile concentrate, being a canned product, will likely move without restriction.

Salt Lake City Market (see table 13)

Whole milk

Of the considered supplies of packaged whole milk, a Logan processor would be in the lowest cost or greatest profit position on the Salt Lake

Table 13. Estimated cost of placing whole milk and concentrated milk on the Salt Lake City market, selected origins, 1959

Product and origin	Milk cost[b]	Processing cost[c]	Transportation cost[d]	Delivery cost[e]	Retail margin[f]	Total cost[g]	23.00 less cost[h]	Rank[i]
	Cents per quart equivalent							
Whole milk								
Local	11.46	4.00	0.00	2.50	2.50	20.46	2.54	3
Logan	9.17	"	0.28	"	"	18.45	4.55	1
Boise	10.06	"	1.27	"	"	20.33	2.67	2
Wichita	10.11	"	3.40	"	"	22.51	0.49	4
Madison	8.80	"	4.92	"	"	22.72	0.28	5
Fresh concentrate								
Local	11.76	3.64	0.00	2.50	2.00	19.90	3.10	5
Logan	9.41	"	0.09	"	"	17.62	5.38	1
Boise	10.33	"	0.42	"	"	18.89	4.11	3
Wichita	10.37	"	1.13	"	"	19.64	3.36	4
Madison	9.03	"	1.64	"	"	18.81	4.19	2
Sterile I								
Local	11.76	4.99	0.00	included	3.24	19.99	3.01	5
Logan	9.41	"	0.02	in	"	17.66	5.34	1
Boise	10.33	"	0.48	retail	"	19.04	3.96	3
Wichita	10.37	"	1.09	margin	"	19.69	3.31	4
Madison	9.03	"	1.46		"	18.72	4.28	2
Los Angeles	11.76	"	0.80		"	20.79	2.21	6
Sterile II								
Local	6.72	4.99	0.00	included	3.24	14.95	8.05	1
Logan	6.72	"	0.02	in	"	14.97	8.03	2
Boise	6.92	"	0.48	retail	"	15.63	7.37	3
Wichita	6.67	"	1.09	margin	"	15.99	7.01	4
Madison	6.88	"	1.46		"	16.57	6.43	6
Los Angeles	7.12	"	0.80		"	16.15	6.85	5

[a] See discussion in Chapter III. Sterile I refers to concentrate made from milk bought at fluid prices. Sterile II is made from milk bought at condensery prices. Logan and Salt Lake City (SLC) were joined in one line on sterile II because costs were the same on all markets except the local Salt Lake City market. Sterile II from local sources in Nevada, Arizona, and New Mexico was not considered because little or no condensery milk or manufacturing grade milk is sold.

Table 13 (cont.)

[b]See tables 6 and 7.

[c]Cost of processing whole milk in paper was obtained by averaging the 1958 report costs for a large and medium size plant and multiplying by 2.15, the pounds of milk in a quart. Source: Milk Distributors' Sales and Costs, April-June, 1959, U. S. Dept. of Agri. For costs of processing concentrate, see discussion in Chapter IV.

[d]See tables 9 and 10.

[e]See discussion in Chaptber IV.

[f]See tables 11 and 12.

[g]Does not include advertising or promotional expenses.

[h]Except for Las Vegas, the price figure in the heading represents the average retail price per half gallon divided by two. Average was made of monthly quotations found in Fluid Milk and Cream Report. Las Vegas price was obtained from Miss Mable Hartley of the University of Nevada. Figures in the columns represent the margins which would be left for profit and additional selling costs.

[i]1 represents the most profitable or least cost position, 2 the second most profitable, etc.

City market. A Salt Lake City processor would be in third position behind Boise. The figures indicate that a Boise processor could possibly place whole milk on the Salt Lake City market at a cost slightly under that of a local processor. Because high transportation costs would leave little if any profit margin, processors from Madison and Wichita would not be able to compete successfully with packaged whole milk.

Fresh concentrate

With fresh concentrate, the competitive position of those markets farthest away from Salt Lake City would be improved. Although a Logan processor would still be in a position to make the greatest profit, Madison, Wichita, and Boise processors could all supply fresh concentrate at less cost than a Salt Lake processor. A two cent discount on fresh concentrate, however, would cut profits of suppliers from Logan, Salt Lake, and Boise to below those on whole milk. This would leave only Madison and Wichita processors with any economic incentive to place fresh concentrate on the Salt Lake City market. A three cent discount would leave only a Madison processor with over a cent profit margin.

Sterile concentrate I

Because of both low milk buying prices and low transportation costs, Logan could place sterile concentrate on the Salt Lake market for the least cost. In addition, suppliers from Wichita, Boise, and Madison could also place sterile on the market for less cost than a local Salt Lake processor. Sterile concentrate from Los Angeles would not be competitive. A three cent discount per quart equivalent would reduce competition to only Logan, Madison, and Boise processors. A five cent discount would

Table 14. Estimated cost of placing whole milk and concentrated milk on the Denver market, selected origins, 1959

Product and origin[a]	Milk cost[b]	Processing cost[c]	Transportation cost[d]	Delivery cost[e]	Retail margin[f]	Total cost[g]	23.50 less cost[h]	Rank[i]
	Cents per quart equivalent							
Whole milk								
Local	12.57	4.00		2.50	2.50	21.57	1.93	4
Salt Lake City	11.46	"	1.71	"	"	22.17	1.33	6
Logan	9.17	"	1.99	"	"	20.16	3.34	1
Boise	10.06	"	2.92	"	"	21.98	1.52	5
Wichita	10.11	"	1.72	"	"	20.83	2.67	3
Madison	8.80	"	3.22	"	"	21.02	2.48	2
Fresh Concentrate								
Local	12.90	3.64		2.50	2.00	21.04	2.46	6
Salt Lake City	11.76	"	0.57	"	"	20.47	3.03	5
Logan	9.41	"	0.66	"	"	18.21	5.29	1
Boise	10.33	"	0.98	"	"	19.45	4.05	4
Wichita	10.37	"	0.58	"	"	19.09	4.41	3
Madison	9.03	"	1.07	"	"	18.24	5.26	2
Sterile I								
Local	12.90	4.99		included	2.89	20.78	2.72	6
Salt Lake City	11.76	"	0.69	in	"	20.33	3.17	5
Logan	9.41	"	0.69	retail	"	17.98	5.52	2
Boise	10.33	"	0.96	margin	"	19.17	4.33	4
Wichita	10.37	"	0.62		"	18.87	4.63	3
Madison	9.03	"	0.88		"	17.79	5.71	1
Sterile II								
Local	6.72	4.99		included	2.89	14.60	8.90	1
Logan and Salt Lake City	6.72	"	0.69	in retail	"	15.29	8.21	3
Boise	6.92	"	0.96	margin	"	15.76	7.74	5
Wichita	6.67	"	0.62		"	15.17	8.33	2
Madison	6.88	"	0.88		"	15.64	7.86	4

See footnotes on table 13.

eliminate all but Logan. At either a three or five cent differential, Utah processors would find it more profitable to sell whole milk or even fresh concentrate rather than a sterile concentrate made from milk which had to be bought at fluid prices.

Sterile concentrate II

With sterile concentrate processed from milk bought at condensery prices, processors from all areas except Boise and Logan could offer a five cent discount under the retail price of whole milk and still make a profit larger than that on their packaged whole milk. With the buying price for condensery milk about as low in Utah as any other part of the country, Utah processors would be in the most competitive position while the more distant processors, primarily because of higher transportation costs, would be in a less competitive position.

Denver Market (see table 14)

Whole milk

A Logan processor appears to be in position to make the most profit from packaged whole milk on the Denver market while a Salt Lake City processors' position would be subordinate to all others considered in this study. A Logan processor's principal competitors would be from Wichita, Madison, and Denver in that order.

Fresh concentrate

A two cent discount on fresh concentrate per quart equivalent would cut unit profit margins of all suppliers, except Madison and Boise, below those for whole milk. Even with the lower transportation cost on fresh

concentrate, Logan and Salt Lake processors would find it more profitable to sell packaged whole milk.

Sterile concentrate I

A three cent discount per quart equivalent on sterile concentrate made from milk bought at fluid prices would largely eliminate Salt Lake and local Denver processors from competition on the Denver market. A five cent discount would leave only Logan and Madison processors with any margin at all, and then less than one cent. Both Logan and Salt Lake processors would be better off profit-wise by trying to sell either whole milk or fresh concentrate rather than sterile concentrate I.

Sterile concentrate II

On the Denver market, all considered competing areas, except possibly Logan, could place a sterile concentrate made from milk at condensery prices on the market at a discount of five cents and still make a profit as large as on packaged whole milk. A local processor, should there be one, would be in the most competitive position followed by Wichita and then Logan or Salt Lake.

Las Vegas Market (see table 15)

Whole milk

With packaged whole milk, a Logan processor would hold the most advantageous position cost-wise; followed by a Los Angeles processor, a local processor, and a Boise processor. A Salt Lake City processor, however, would still be able to make about the same profit margin as on the local Salt Lake market. Transportation costs would leave Wichita and Madison processors with comparatively small margins.

Table 15. Estimated cost of placing whole milk and concentrated milk on the Las Vegas market, selected origins, 1959

Product and origin[a]	Milk cost[b]	Processing cost[c]	Transportation cost[d]	Delivery cost[e]	Retail margin[f]	Total cost[g]	25.00 less cost[h]	Rank[i]
	Cents per quart equivalent							
Whole milk								
Local	12.22	4.00	0.00	2.50	3.00	21.72	3.28	2
Salt Lake City	11.46	"	1.50	"	"	22.46	2.54	5
Logan	9.17	"	1.78	"	"	20.45	4.55	1
Boise	10.06	"	2.28	"	"	21.84	3.16	4
Wichita	10.11	"	4.12	"	"	23.73	1.27	6
Madison	8.80	"	6.38	"	"	24.68	0.32	7
Los Angeles	11.46	"	0.82	"	"	21.78	3.22	3
Fresh Concentrate								
Local	12.54	3.64	0.00	2.50	2.50	21.18	3.82	7
Salt Lake City	11.76	"	0.50	"	"	20.90	4.10	6
Logan	9.41	"	0.59	"	"	18.64	6.36	1
Boise	10.33	"	0.76	"	"	19.73	5.27	2
Wichita	10.37	"	1.37	"	"	20.38	4.62	4
Madison	9.03	"	2.13	"	"	19.80	5.20	3
Los Angeles	11.76	"	0.28	"	"	20.68	4.32	5
Sterile I								
Salt Lake City	11.76	4.99	0.57	included	3.29	20.61	4.39	6
Logan	9.41	"	0.57	in	"	18.26	6.74	1
Boise	10.33	"	0.68	retail	"	19.29	5.71	3
Wichita	10.37	"	1.61	margin	"	20.26	4.74	4
Madison	9.03	"	1.70		"	19.01	5.99	2
Los Angeles	11.76	"	0.47		"	20.51	4.49	5
Sterile II								
Logan and Salt Lake City	6.72	4.99	0.57	included	3.29	15.57	9.43	1
Boise	6.92	"	0.68	in	"	15.88	9.12	3
Wichita	6.67	"	1.61	retail	"	16.56	8.44	4
Madison	6.88	"	1.70	margin	"	16.86	8.14	5
Los Angeles	7.12	"	0.47		"	15.87	9.13	2

See footnotes on table 13.

Fresh concentrate

About the only effect fresh concentrate would have is to bring processors from Wichita and Madison more into competition. A Logan processor would still remain in the best profit making position of those suppliers considered, but a Salt Lake processor would drop to next to last position. A two or three cent discount per quart equivalent would lower profit margins of Utah processors below those for packaged whole milk. Only a Madison and a Wichita processor would gain from placing fresh concentrate on the Las Vegas market instead of whole milk.

Sterile concentrate I

All considered supplying areas could offer at least a three cent discount on sterile concentrate made from milk bought at fluid prices and still make a profit on the Las Vegas market. A five cent discount would tend to reduce competition to suppliers from Logan, Madison, and Boise. With either a three or five cent discount, sterile concentrate I would not bring as great a return to Utah processors as would packaged whole milk or fresh concentrate. At a five cent discount Logan would still make over one cent profit per quart equivalent, but Madison and Boise processors would make less than one cent profit.

Sterile concentrate II

The figures indicate that a Logan or Salt processor would make as great a profit on sterile concentrate made from milk at condensery prices as any other of the supplying areas. All areas could offer a five or six cent discount per quart equivalent and still realize a sizeable profit. The areas which would tend to benefit most from sterile concentrate would be Madison and Wichita.

Los Angeles Market (see table 16)

Whole milk

The figures indicate that the cost of placing packaged whole milk from Salt Lake City on the Los Angeles market would be about as great as the return. A Logan processor, however, would be in a good competitive position although profit margin would be less than that for a Los Angeles processor. Competition from other areas appears unlikely because of the high transportation costs.

Fresh concentrate

A two cent discount per quart equivalent on fresh concentrate would largely limit competition on the Los Angeles market to Logan, Boise, Madison, and Los Angeles processors. A Logan processor would be in the best profit making position. At a two cent discount, processors from Boise, Madison, and Logan would gain more profit per quart equivalent from fresh concentrate than from packaged whole milk. At a three cent discount, however, profits would be below those on whole milk.

Sterile concentrate I

A three cent discount per quart equivalent on sterile concentrate made from milk bought at fluid prices would leave only Logan, Madison, and Boise processors with any profit margin on the Los Angeles market. Both a Logan and a Boise processor could make more profit on fresh whole milk or fresh concentrate than on sterile concentrate I. A discount of five cents would make it impossible for any of the areas to sell sterile concentrate I at a profit.

Table 16. Estimated cost of placing whole milk and concentrated milk on the Los Angeles market, selected origins, 1959

Product and origin[a]	Milk cost[b]	Processing cost[c]	Transportation cost[d]	Delivery cost[e]	Retail margin[f]	Total cost[g]	21.75 less cost[h]	Rank[i]
	Cents per quart equivalent							
Whole milk								
Local	11.46	4.00		1.60	2.00	19.06	2.69	1
Salt Lake City	11.46	"	2.47	"	"	21.53	0.22	4
Logan	9.17	"	2.75	"	"	19.52	2.23	2
Boise	10.06	"	2.97	"	"	20.63	1.12	3
Wichita	10.11	"	4.69	"	"	22.40	loss	--
Madison	8.80	"	7.12	"	"	23.52	loss	--
Fresh Concentrate								
Local	11.76	3.64		1.60	1.50	18.50	3.25	4
Salt Lake City	11.76	"	0.82	"	"	19.32	2.43	6
Logan	9.41	"	0.92	"	"	17.07	4.68	1
Boise	10.33	"	0.99	"	"	18.06	3.69	2
Wichita	10.37	"	1.56	"	"	18.67	3.08	5
Madison	9.03	"	2.37	"	"	18.14	3.61	3
Sterile I								
Local	11.76	4.99		included	2.09	18.84	2.91	4
Salt Lake City	11.76	"	0.86	in	"	19.70	2.05	6
Logan	9.41	"	0.86	retail	"	17.35	4.40	1
Boise	10.33	"	1.05	margin	"	18.46	3.29	3
Wichita	10.37	"	1.61		"	19.06	2.69	5
Madison	9.03	"	1.70		"	17.81	3.94	2
Sterile II								
Local	7.12	4.99		included	2.09	14.20	7.55	1
Logan and Salt Lake City	6.72	"	0.86	in retail	"	14.66	7.09	2
Boise	6.92	"	1.05	margin	"	15.05	6.70	3
Wichita	6.67	"	1.61		"	15.36	6.39	4
Madison	6.88	"	1.70		"	15.66	6.09	5

See footnotes on table 13.

Sterile concentrate II

A locally processed sterile concentrate made from milk at condensery price would have a slight advantage over a Logan or Salt Lake product on the Los Angeles market. Most supplying areas could offer a five cent discount and still make a profit larger than they could on packaged whole milk or fresh concentrate, although the remaining profit would be less than for sterile concentrate placed on any of the other markets considered in this study.

Phoenix Market (see table 17)

Whole milk

Of the possible supplying areas, only Logan could place whole milk on the Phoenix market at a lower cost than a local processor. A Salt Lake processor would enjoy little if any profit margin.

Fresh concentrate

With a two cent discount per quart equivalent on fresh concentrate, all areas except Salt Lake City and Los Angeles could sell fresh concentrate and still retain at least a one cent profit margin on the Phoenix market. Even though a Logan processor could make a larger profit on the sale of fresh concentrate than any other area, a two or three cent discount would lower profit margins below those on packaged whole milk.

Sterile concentrate I

With a three cent discount, all considered supplying areas except Salt Lake City could place sterile concentrate made from milk at fluid price on the Phoenix market and make some profit, Logan having the largest profit margin. A Logan processor could make more money per quart equivalent

Table 17. Estimated cost of placing whole milk and concentrated milk on the Phoenix market, selected origins, 1959

Product and origin[a]	Milk cost[b]	Processing cost[c]	Transportation cost[d]	Delivery cost[e]	Retail margin[f]	Total cost[g]	23.15 less cost[h]	Rank[i]
	Cents per quart equivalent							
Whole milk								
Local	11.64	4.00		2.50	2.50	20.64	2.51	2
Salt Lake City	11.46	"	2.46	"	"	22.92	0.23	6
Logan	9.17	"	2.74	"	"	20.91	3.24	1
Boise	10.06	"	3.72	"	"	22.78	0.37	5
Wichita	10.11	"	3.50	"	"	22.61	0.54	4
Madison	8.80	"	5.85	"	"	23.65	loss	--
Los Angeles	11.46	"	1.30	"	"	21.76	1.39	3
Fresh Concentrate								
Local	11.94	3.64		2.50	2.00	20.08	3.07	5
Salt Lake City	11.76	"	0.82	"	"	20.72	2.43	7
Logan	9.41	"	0.91	"	"	18.46	4.69	1
Boise	10.33	"	1.24	"	"	19.71	3.44	4
Wichita	10.37	"	1.17	"	"	19.68	3.47	3
Madison	9.03	"	1.95	"	"	19.12	4.03	2
Los Angeles	11.76	"	0.43	"	"	20.33	2.82	6
Sterile I								
Local	11.94	4.99		included	2.74	19.67	3.48	4
Salt Lake City	11.76	"	0.98	in	"	20.47	2.68	7
Logan	9.41	"	0.98	retail	"	18.02	5.03	1
Boise	10.33	"	1.12	margin	"	19.18	3.97	3
Wichita	10.37	"	1.61		"	19.71	3.44	5
Madison	9.03	"	1.70		"	18.46	4.69	2
Los Angeles	11.76	"	0.50		"	19.99	3.16	6
Sterile II								
Logan and Salt Lake City	6.72	4.99	0.98	included	2.74	15.43	7.72	2
Boise	6.92	"	1.12	in	"	15.77	7.38	3
Wichita	6.67	"	1.61	retail	"	16.01	7.14	4
Madison	6.88	"	1.70	margin	"	16.31	6.84	5
Los Angeles	7.12	"	0.50		"	15.35	7.80	1

See footnotes on table 13.

selling whole milk, however. With a five cent discount, no area would find it profitable to sell sterile concentrate I on the Phoenix market.

Sterile concentrate II

With a sterile concentrate made from milk at condensery prices, again all areas could offer a discount of five cents under the local price of whole milk and still make a profit about as large as on whole milk. A Los Angeles processor would be in the best competitive position with a Logan or Salt Lake City processor slightly less competitive. Madison and Wichita processors would have the smallest profit margins of the considered suppliers.

Albuquerque Market (see table 18)

Whole milk

Processors in all considered supplying areas could make a profit with packaged whole milk on the Albuquerque market. Logan would be in a position to make a slightly larger profit than second place Wichita. Although a Salt Lake processor would be in fifth place, a profit margin as large as on the local Salt Lake City market would still be possible.

Fresh concentrate

The top four competitors with fresh concentrate on the Albuquerque market appear to be Logan, Madison, Wichita, and Boise processors, in that order. Salt Lake would rank fifth, slightly ahead of Los Angeles and Albuquerque. A two cent discount per quart equivalent would still leave profit margins on fresh concentrate above those on whole milk for all except local and Salt Lake City processors. With a three cent discount, only Madison would retain a profit margin above that possible on packaged whole milk.

Table 18. Estimated cost of placing whole milk and concentrated milk on the Albuquerque market, selected origins, 1959

Product and origin[a]	Milk cost[b]	Processing cost[c]	Transportation cost[d]	Delivery cost[e]	Retail margin[f]	Total cost[g]	26.50 less cost[h]	Rank[i]
	Cents per quart equivalent							
Whole milk								
Local	12.55	4.00		2.50	3.50	22.55	3.95	3
Salt Lake City	11.46	"	2.09	"	"	23.55	2.95	5
Logan	9.17	"	2.37	"	"	21.54	4.96	1
Boise	10.06	"	3.56	"	"	23.62	2.88	6
Wichita	10.11	"	2.15	"	"	22.26	4.24	2
Madison	8.80	"	4.42	"	"	23.22	3.28	4
Los Angeles	11.46	"	2.66	"	"	24.12	2.38	7
Fresh concentrate								
Local	12.88	3.64		2.50	3.00	22.02	4.48	7
Salt Lake City	11.76	"	0.70	"	"	21.60	4.90	5
Logan	9.41	"	0.79	"	"	19.34	7.16	1
Boise	10.33	"	1.19	"	"	20.66	5.84	4
Wichita	10.37	"	0.72	"	"	20.23	6.27	3
Madison	9.03	"	1.47	"	"	19.64	6.86	2
Los Angeles	11.76	"	0.89	"	"	21.79	4.71	6
Sterile I								
Local	12.88	4.99		included	2.89	20.76	5.74	6
Salt Lake City	11.76	"	1.10	in	"	20.74	5.76	5
Logan	9.41	"	1.10	retail	"	18.39	8.11	2
Boise	10.33	"	1.38	margin	"	19.59	6.91	4
Wichita	10.37	"	0.73		"	18.98	7.52	3
Madison	9.03	"	1.06		"	17.97	8.53	1
Los Angeles	11.76	"	1.33		"	20.97	5.53	7
Sterile II								
Logan and Salt Lake City	6.72	4.99	1.10	included	2.89	15.70	10.80	2
Boise	6.92	"	1.38	in	"	16.18	10.32	4
Wichita	6.67	"	0.73	retail	"	15.28	11.22	1
Madison	6.88	"	1.06	margin	"	15.82	10.68	3
Los Angeles	7.12	"	1.33		"	16.33	10.17	5

See footnotes on table 13.

Sterile concentrate I

Margins appear high enough that all except a local processor could offer a discount of three cents on sterile concentrate made from milk at fluid price and still make about as much profit as would be possible on packaged whole milk or fresh concentrate. With a discount of five cents, all areas could still make some profit on the Albuquerque market. Except for Madison, this profit per quart equivalent would be below that on packaged whole milk or fresh concentrate, however. Regardless of the discount, Madison would be the most competitive with Logan second. Salt Lake City, local, and Los Angeles processors would be in the poorest competitive positions.

Sterile concentrate II

Because of the high local price of whole milk, all areas could place sterile concentrate made from milk at condensery price on the Albuquerque market at discounts of five cents per quart equivalent and still make greater profits than would be possible on any of the other considered products. Wichita would be in the most competitive position with Logan or Salt Lake City in second place.

CHAPTER VI

SUMMARY AND CONCLUSIONS

During the last two decades production of milk in Utah has increased at a faster rate than population. This has caused the market milk industry in Utah to go from a favorable supply-consumption balance to one of considerable excess supply. This excess market milk must either be shipped out of state as fluid milk, or receive a lower price and be used in manufactured products.

Three factors would help alleviate the situation: (a) a more rapid increase in population than production, (b) an expansion of out-of-state markets, and (c) a greater per capita consumption. Of the three, expansion into new markets appears the quickest and most likely means of increasing returns to Utah's dairy industry.

A principle limiting factor to market expansion, aside from trade barriers, has been the cost of transporting whole milk. Through a new concentration process, however, milk can be reduced to one-third its original volume for transportation yet retain its fresh flavor when reconstituted. There are two kinds of concentrated milk: fresh and sterile. Fresh concentrate can be handled in bulk or paper cartons and requires refrigeration while sterile concentrate is a canned product usually having a shelf life of several months without refrigeration. Both products would reduce the transportation cost of milk by about two-thirds.

Concentrated milk might not only be a more profitable outlet for

Utah surplus milk, but a means to broaden markets and increase sales. On the other hand, concentrated milk might also be a means by which other areas of surplus production could enter western markets and outcompete Utah milk. The purpose of this study has been, therefore, to evaluate what the possible competitive position of Utah milk concentrate might be on selected potential markets.

The potential markets for Utah milk as well as Utah's possible competitors on these markets were determined by looking at interregional and intraregional production-consumption balances. The markets where expansion appeared likely for Utah milk included cities in Utah, Colorado, Nevada, Arizona, and New Mexico. California might possibly become a market. Possible competition on these markets (besides local processors) could come from processors in Idaho, California, Kansas, and Wisconsin.

The buying price used for milk going into fresh concentrate in each of the supplying areas was the same as that for packaged Utah milk. Two buying prices were used for milk going into sterile concentrate; the fluid or class I price and the condensery price. This was done because of the uncertainty as to which class will be used. Processing costs for efficient plants were developed from published material. Transportation costs were obtained from milk dealers and transporting agencies. Delivery costs and retail margins were derived from those on packaged Utah milk and evaporated milk.

Using cost data, figures were developed which would represent the lowest price at which efficient processors in Utah and competing areas could place whole milk, fresh concentrate, and sterile concentrate on selected markets. When such prices were compared with each other and

to the retail store price for packaged whole milk, the following observations and conclusions were made:

1. On all of the considered markets, a Logan, Utah processor would be as competitive with whole milk, fresh concentrate, and sterile concentrate as any of the other selected suppliers. Except with whole milk on the local Salt Lake City market and with a sterile concentrate made from from milk at condensery prices, a Salt Lake area processor would seldom be in a very good competitive position. This difference between the positions of the two supplying areas of Utah was almost entirely due to the lower buying price in Logan for milk going into fluid use.

2. For Utah processors, fresh concentrate does not appear to be a more profitable means for expansion on most western markets than does whole milk. This is because the discount necessary for concentrate to sell would be as great or greater than the saving in transportation costs. The markets which appeared the most favorable for Utah fresh concentrate were Albuquerque and Los Angeles. On these two markets, a two-cent discount could leave Utah processors with a slightly larger profit margin than on whole milk. A three-cent discount, however, would decrease margins to below those for whole milk.

3. Although Utah processors could likely place on Western markets a sterile concentrate made from milk at fluid prices for less total cost than either fresh concentrate or packaged whole milk, the discount needed to gain consumer acceptance would probably lower profit margins to below those on the alternative products. Since sterile concentrate I would probably cross trade barriers restricting movement of fresh concentrate and packaged whole milk, however, it could still be a profitable means of market expansion for at least a Logan processor.

4. A sterile concentrate made from milk at condensery prices or prices below those for milk going into fluid use appears to be the greatest potential market expander of those products considered. A three to five-cent discount per quart equivalent on this product below the retail price of whole milk would still leave Utah processors with good profit margins, perhaps as large as on whole milk. Although the producer would receive less than fluid prices for this milk, the blend or average price for all milk might be raised slightly. This would likely occur, however, only if the product were used primarily for expansion on markets other than local.

5. The product with the greatest potential threat to local Utah markets would likely be a sterile concentrate made from milk bought at condensery prices or at least at prices below those for milk going into fluid use. A profit incentive appears to exist for such a product to come into Utah from at least several areas.

6. Lower processing costs in one area than another, use of a backhaul to lower transportation costs, and greater decreases in distribution costs or retail margins for concentrate; could one or all affect the competitive relationship between Utah processors and those from other areas. When more complete cost data are available on milk concentrate, or if a processor has his own cost data to enter into the analysis, the conclusions should be re-evaluated.

LITERATURE CITED

(1) Allred, Wells M., and Edward H. Ward. Costs, Quality and Prices of Fluid Milk in Rural and Urban Areas of Utah and Montana. Utah Agricultural Experiment Station Bulletin No. 365, 1953.

(2) Bartlett, R. W. Concentrated Milk: Actual and Potential Sales. Paper delivered before Dairy Marketing Conference held at the University of Illinois, January 31, 1956. Mimeograph A E 3117.

(3) Bartlett, R. W. "Concentrated Milk May Find Wide Market." Illinois Research, Vol. 1, No. 2. (Spring, 1959) University of Illinois, 1959.

(4) Bartlett, R. W. Letter announcing Third Annual Agricultural Industries Forum. University of Illinois (Nov. 14, 1960).

(5) Bartlett, R. W. Letter to Norman Myrick. American Milk Review (June, 1956), p. 25.

(6) Bartlett, R. W. "Marketing Concentrated Milk." Illinois Farm Economics (March-April, 1951). University of Illinois, 190-191: 1133.

(7) Bartlett, R. W. "Marketing Illinois Concentrated Milk in Florida." Illinois Farm Economics (October, 1951), University of Illinois, 197:1236-45.

(8) Bartlett, R. W. "Midwesterner Takes a Look at Concentrated Milk." American Milk Review (June, 1951), p. 22.

(9) Bartlett, R. W. "Should We have Marketing Quotas to Improve Prices Paid Producer?" Paper presented at 31st Annual Meeting of the American Institute of Cooperation, University of Illinois, August 10, 1959.

(10) Bay, Ovid. "Can Concentrated Milk Crack Market Barriers?" Farm Journal (March, 1960), p. 60.

(11) Blake, Glen D. "Concentrated Milk." Paper presented at Dairy Marketing Conference held at University of Illinois, February 7, 1951.

(12) "Brand-New Concentrated Milk Has Immense Possibilities." The Feed Bag (April, 1958), p. 7.

(13) Christensen, R. A. Supply and Use of Market Milk in Utah. Utah Resources Report 2, Agricultural Experiment Station, Utah State University, April, 1960.

(14) Clay, M. W. "Navy Interest in Concentrated Milk." The Milk Dealer (October, 1952), p. 56.

(15) "Coming--Sterilized Milk." Successful Farming (March, 1957), p. 90.

(16) "Commentary on New Sterile Concentrated Milk." Hoard's Dairyman (February 25, 1958), pp. 197-200.

(17) "Concentrated Fresh Milk Stirs Far-Flung Markets." News for Farmer Cooperatives (July, 1957), p. 15.

(18) "Concentrated Milk." American Milk Review (March, 1960), p. 38.

(19) "Concentrated Milk." Wall Street Journal, Pacific Coast Edition, May 17, 1951, p. 1.

(20) "A Concentrated Push in Wisconsin." Milk Plant Monthly (April, 1957), p. 41.

(21) Davidson, Donald R. Grade A Milk Marketing by Manufacturing Coops; USDA Farmer Cooperative Service, General Report 56. May, 1959.

(22) "Federal Orders and Concentrated Milk." American Milk Review (August, 1951), p. 36.

(23) Forker, Oland D. and D. A. Clark, Jr. Changes in Milk Delivery Costs and Volume-Pricing Procedures in California. California Agricultural Experiment Station, Mimeographed Report No. 236, November, 1960.

(24) Froker, Rudolph K. Effects of New and Improved Products on Prices and Markets for Milk. Paper delivered during Farm and Home Week at Cornell University, March 24, 1960.

(25) Great Basin Milk Marketing Area. Market Reporter. Salt Lake Ciy: Federal Order No. 63, Vol. 1, Numbers 1-12, 1960.

(26) Guilfoyle, Joseph M. "Concentrated Milk." Wall Street Journal, November 1, 1950.

(27) "Introduction of Concentrated Milk in Bottles Raises Question." Dairy Produce (November, 1934), p. 395.

(28) Kleiman, G. C. "Consumer Acceptance of Concentrated Milk." Illinois Farm Economics (October, 1951), University of Illinois, 197:1245.

(29) "Lower Supports Likely for Milk and Wheat." Wallaces Farmer, (November 1, 1958), p. 8.

(30) Mac Pherson, D. D., and Helen V. Smith. Milk Distributors' Sales and Cost, April-June, 1960. U. S. Dept. of Agri. MDSC No. 15, October, 1960.

(31) Mathis, Anthony G. "Concentrated Whole Milk Is a Qualified Challenge." Agricultural Marketing (February, 1958), p. 5.

(32) Mathis, Anthony G. Probable Impact of Milk Concentrates on the Fluid Milk Market. USDA Marketing Research Report No. 208. Washington, D. C.: U. S. Govt. Printing Office, February, 1958.

(33) McCall, Lt. Colonel Robert G. "Army Approves Concentrated Milk." Milk Plant Monthly (April, 1955), p. 20.

(34) Miller, Ray. "Letter to the Editor." American Milk Review (January, 1950), p. 30.

(35) Myrick, Norman. "Concentrated Milk Looks for a Place in the Market." American Milk Review (September, 1959), p. 60.

(36) Myrick, Norman, "Concentrated Milk--Spur Track or Main Line." American Milk Review (June, 1951), p. 8.

(37) "New Sterile Concentrated Milk Developed." Hoard's Dairyman, (December 10, 1957), p. 1169.

(38) Nielson, V. H. "The Technology of Concentrated Milk." American Milk Review (September, 1959), p. 64.

(39) Parker, E. J., and E. S. Harris. "What Has Happened to Concentrated Milk." USDA Marketing Activities (July, 1953), p. 7.

(40) Purcell, Margaret R., and Louis G. Herrmann. Experience with Classification of Milk in Federal Order Markets. USDA Marketing Research Report No. 288. Washington, D. C.: U. S. Govt. Printing Office, 1958.

(41) Rickens, James A., and L. C. Thomsen. Costs of Processing, Transporting, and Distributing Fresh and Sterile Concentrated Milk. Wisconsin Agricultural Experiment Research Bulletin 204. University of Wisconsin, March 1958.

(42) Saal, Herbert. "Concentrated Milk--Its Status and Possible Effects." American Milk Review (March, 1960), p. 38.

(43) "Safeway's Concentrate Upsets Milk Market." Business Week (July 7, 1951), p. 120.

(44) Trout, G. M., and G. G. Quackenbush. "What Do Consumers Think of Bottled Fresh Concentrate?" American Milk Review (November, 1949), p. 42.

(45) "The Ups and Downs of Concentrated Milk." Fortune (September, 1951), p. 164.

(46) Utter, K. L., et al. Methods and Costs of Processing and Delivering Fresh Concentrated Milk in Rural Areas. Iowa Agricultural Exp. Station Special Report No. 14, Iowa State College, November, 1955.

(47) Ward, Edward H., and Hugh L. Cook. Concentrated Milk: Some Aspects of Costs and Acceptance for Retail Distribution. Univ. Wis., Dept. of Agr. Econ. 12, September, 1954.