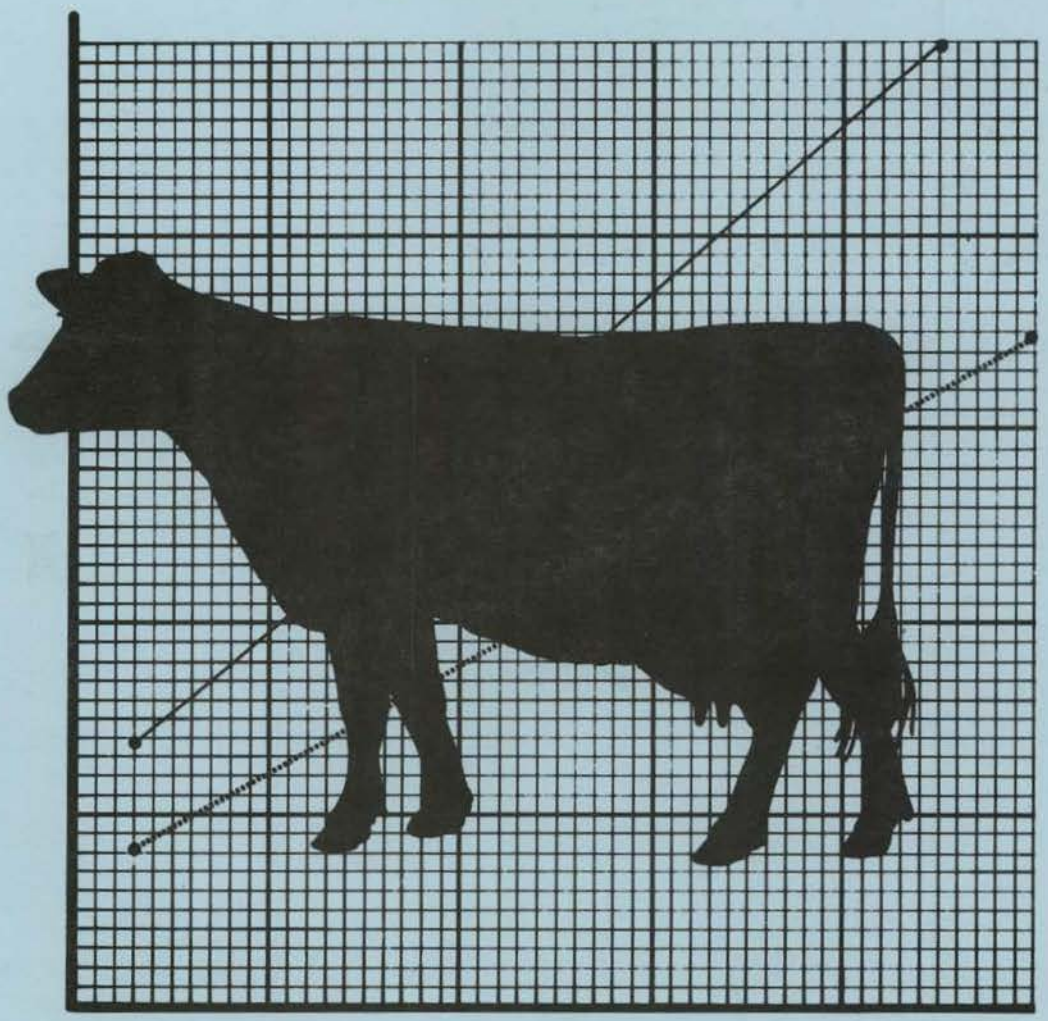
Bulletin No. 641

The Idaho Dairy Industry

An Economic Overview

Russell V. Withers



Agricultural Experiment Station
University of Idaho
College of Agriculture

Contents

Published and distributed by the
Idaho Agricultural Experiment Station
R. J. Miller, Director

University of Idaho College of Agriculture
Moscow 83843

1500 2-85

$1.50 per copy

The Idaho Dairy Industry: An Economic Overview

Russell V. Withers, Professor,
Department of Agricultural Economics

Dairy farming has been a mainstay in Idaho agriculture for many years. Cash receipts received by farmers for milk have recently ranked fourth in economic importance in Idaho, following cattle, potatoes and wheat. Dairying is underrated in these comparisons because only milk sales are included. Income from the sale of dairy calves and cows for beef is an additional source of income to milk producers.

Cash receipts to Idaho dairy farmers for the sale of milk was nearly $291 million in 1983. An additional $1.2 million in milk value was used on farms where it was produced. Farm receipts for milk in 1983 were 6.4 percent higher than the $273 million received in 1981. Idaho milk production increased 6.3 percent from 1981 to 1983. Milk prices **did not** increase during this 1981 to 1983 period. (USDA, CRB, SRS 1984).

A considerable number of people were employed in the transportation, processing and marketing of milk and milk products. The dairy industry hired about 900 employees in Idaho in 1977 who received more than $9 million in wages (Employment Status 1977). Many other people were involved in the marketing and distribution of dairy products. In 1977 Idaho had 970 food stores that hired about 7,500 employees (U.S. Department of Commerce 1979).

Dairy products comprised about 12.5 percent of the nation's consumer expenditures for food in 1982, about the same proportion as it has been for the past few years (USDA, ERS 1983). No separate figures are available for Idaho, but consumer expenditures per capita are assumed to be close to the national average. Thus, it can be seen that the dairy industry is very substantial in the economy of Idaho, and dairy products make up an important part of the average diet of Idaho residents.

Consumers in the United States spent $43.8 billion for dairy products in 1982, an increase of 15.9 percent over 1980. The increase was mostly caused by increased prices and increased expenditures away from home rather than an increase in the consumption of dairy products. Commercial disappearance of dairy products on a milk equivalent basis increased almost 2 percent in 1982 and less than 1 percent in 1983 (USDA, ERS 1984c).

Even though consumer expenditures for dairy products have been increasing, the proportion of total consumer expenditures spent on dairy products has declined from 17.7 percent in 1950 to 12.5 percent in 1982 (USDA, ERS 1983). Most of the decline in the percentage of the food dollar occurred between 1950 and 1970. Since 1970, this percentage has remained rather constant, ranging from 12.3 to 14 percent (USDA, ERS 1984e).

Table 1. Expenditures for dairy products as percentage of all food and civilian consumption per capita of milk equivalents in dairy products, United States, 1950-1983 (USDA, AMS 1957; USDA, ERS 1984b and 1984e).

Year	Expenditures for dairy produces as percentage of all food	Civilian consumption of milk equivalents of dairy products per capita
	(%)	(lb)
1950	17.7	741
1955	17.7	707
1960	17.2	653
1965	15.2	620
1970	14.0	561
1971	12.3	556
1972	13.6	558
1973	13.0	551
1974	13.0	539
1975	12.6	540
1976	13.2	540
1977	12.8	542
1978	12.5	545
1979	12.3	548
1980	12.6	544
1981	12.6	543
1982	12.5	562
1983	12.5	578

Total milk consumption per capita showed a similar pattern. Per capita consumption was 741 pounds in 1950. By 1970, consumption per capita had declined to 561 pounds. Per capita consumption stabilized at about this level through 1981 and has been increasing slightly since then until this writing in 1984 (USDA, ERS 1984a). This may be a response to the very stable prices for dairy products prevailing for the years after the changing dairy price support policy. Table 1 illustrates these changes.

Dairy products are more economical now than in the past in terms of labor required to earn a given amount of product. For example, it took 29.6 minutes in 1950 for a worker earning the average hourly rate in manufacturing industries to pay for 1 pound of butter. In 1982 it took only 14.4 minutes. In 1950, it took 15.8 minutes to earn 1/2 gallon of milk compared to 7.9 minutes in 1982. The average worker expended 11.7 minutes of labor for 1/2 pound of American cheese in 1950 compared to 9.3 minutes in 1982. To earn 1/2 gallon of ice cream required 35.6 minutes in 1951 compared to 14.8 minutes in 1982. Most of these prices have been fairly stable in terms of labor since 1970, meaning that wages and dairy product prices increased by about the same rate between 1970 and 1980 (USDA, ERS 1983).

Milk Production

Milk production in the United States declined from the early 1960s to the mid-1970s but then increased by 21 percent between 1975 and 1983 reaching a record total of 140 billion pounds. So far in 1984, milk production has been below that of 1983. The proportion of all milk marketed that has been used for manufactured dairy products has increased from 55 percent in 1975 to 65 percent in 1983. Conversely, this indicates that the proportion of milk used for fluid purposes has declined to 35 percent of the total (USDA, ERS 1984d). The surplus shows up as butter, nonfat dry milk powder and cheese because essentially all milk not needed for fluid products is turned into these manufactured products. Changes in total U.S. milk production between 1924 and 1983 are shown in Fig. 1. There have been many fluctuations, but the trend has been upward.

Idaho milk production has increased substantially since 1975. Fig. 2 illustrates Idaho milk production since 1924. The production trend has been upward since 1924 with periods of decline occurring from 1945 to 1951 and again from 1960 to about 1970.

Cow numbers were highest in the mid-1950s and reached a low point in 1978. Since 1978, the number of milk cows on Idaho farms has increased substantially reaching 174,000 by 1983 compared with 140,000 in 1978. Fig. 3 illustrates cow number changes compared with production per cow. Milk production per cow has more than doubled since 1950. Production per cow that year was 6,300 pounds compared to 13,207 pounds per cow in 1983. Even though cows were considerably fewer in 1983 than in some earlier years, total production was a record because of the large output per cow. Increased production per cow has resulted from a combination of improved breeding, higher feeding of concentrates and better nutrition and more careful management of herds.

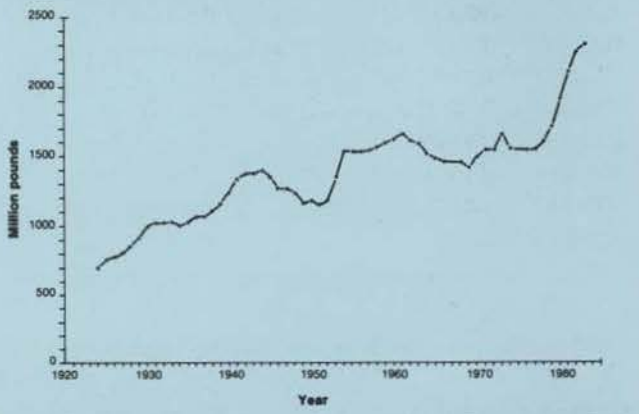


Fig. 2. Total milk production, Idaho, 1924-1983 (USDA, ERS 1984).

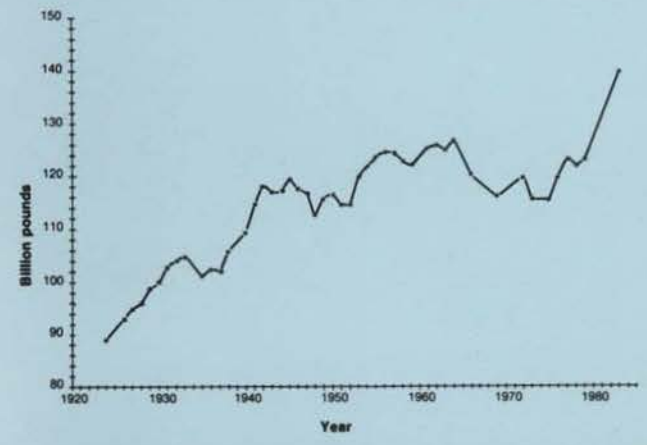


Fig. 1. Total milk production, U.S., 1924-1883 (USDA, ERS 1984).

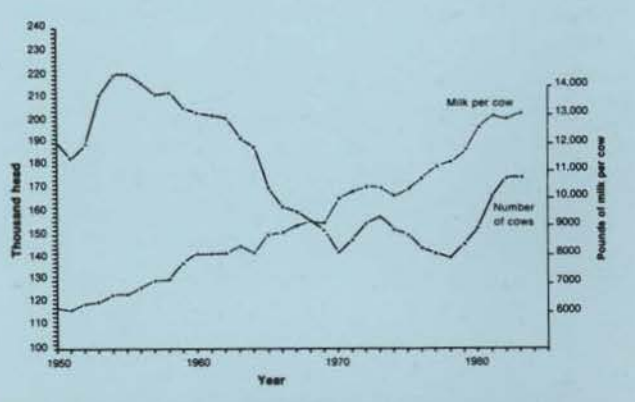


Fig. 3. Number of cows and milk production per cow, Idaho, 1950-1983 (USDA, ERS 1984).

Milk is produced in most parts of Idaho, but areas of concentration are located in southern Idaho. Four identifiable areas based on cow numbers and corresponding production stand out. Three of these are located along the Snake River — southwestern Idaho from Weiser to Boise, southcentral Idaho from Gooding to the Burley-Rupert area and the upper Snake River Valley from American Falls to Fremont County. The fourth area extends from the Utah border to Soda Springs, including Franklin County and parts of Oneida, Bear Lake and Caribou counties. Other production is scattered throughout the state.

Fig. 4 identifies areas of concentration and gives the numbers of dairy cows for each county as reported in the 1982 Agricultural Census (U.S. Department of Commerce 1983). Areas of concentration of milk production coincide with irrigated valleys that produce an abundance of feed for dairy cattle and also have access to transportation facilities. Climatic factors in Idaho are favorable to dairy cattle.

Processing Milk and Dairy Products

Most of Idaho's milk is processed into manufactured products such as cheese, butter and dry milk. A wide variety of other dairy products are manufactured in lesser quantities. In addition, facilities exist for processing and packaging fluid milk and milk products at several locations. Table 2 gives types of processing occurring at various Idaho locations according to licenses in 1981. The "other products" category includes items of lower economic importance.

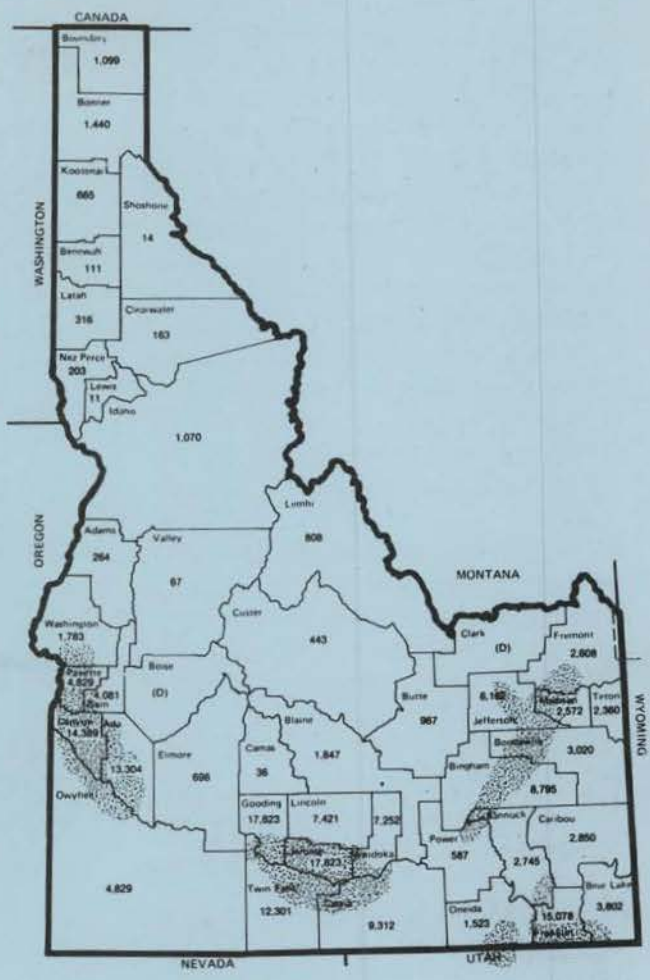


Fig. 4. Number of milk cows by county, Idaho, 1982 (U.S. Deparment of Commerce 1982).
(D) Withheld to avoid disclosing data for individual farms.

Table 2. Types of processing that occurred at various Idaho locations, 1981 (Idaho Department of Health and Welfare 1980).

Location	Butter	American cheese	Other cheese	Nonfat dry milk	Whey products	Ice cream mix	Evaporated milk	Process cheese	Fluid milk	Other products
Blackfoot		X	X		X					
Boise			X			X			X	X
Buhl							X			X
Burley									X	
Caldwell	X	X		X	X				X	X
Carey		X			X					
Idaho Falls	X	X				X			X	X
Jerome										X
Lewiston	X		X			X		X	X	X
Meridian									X	
Nampa		X	X							
Payette									X	
Pocatello						X		X	X	
Rexburg		X	X							
Richfield		X			X					
Rigby	X	X								
Ririe		X	X							
Rupert		X	X		X					
Salmon	X	X			X					
Sandpoint		X	X							
St. Anthony		X								
Twin Falls		X	X	X					X	X

These processing facilities are owned and operated by dairy cooperatives, national food companies, local companies and, in some cases, by an individual or a family. Processing plants also vary in size from large volume multiproduct plants to small plants producing a single product.

Problems encountered in operating dairy processing plants relate to volume of product, uneven supplies of milk, quality control, labor difficulties and the full gamut of marketing problems. Since most products are sold out of the state, transportation is an important marketing factor. Promotion of Idaho products is another important activity because several production areas often compete for the same market.

Milk production in 1983 in Idaho was 2,298 million pounds. About 97 percent of that was sold to plants and dealers, while 1 percent was sold directly to consumers. The remaining 2 percent was used on the farm for feeding calves and for use by the farm family. Table 3 summarizes the production and disposition of milk in Idaho.

Table 3. Production and disposition of milk in Idaho, 1983 (USDA, CRB, SRS 1984).

	Million pounds	% of total*
Total production	2,298	100.0
Sold to plants and dealers	2,225	96.8
Fed to calves	44	1.9
Sold directly to consumers	20	0.87
Used for milk, cream and butter on farms where produced	9	0.39

*Numbers may not add to total due to rounding.

Dairy products manufactured in Idaho from 1978 through 1983 are shown in Table 4. Note that production of these products, especially American cheese, has increased substantially over this period. Total American cheese increased 58 percent, most of which was increased production of cheddar cheese.

Production and Disposition Of Milk and Dairy Products

Milk production in Idaho increased by 48 percent from 1971 to 1983 with most of the increase occurring since 1977. Total Idaho milk production in 1983 was 2,298 million pounds or 6.3 percent more than was produced in 1981. If we assume that per capita milk and dairy products are consumed at the same rate in Idaho as the national average (578 lb per capita), about 25 percent of production was consumed by Idaho people. After deducting the amount used on farms for livestock feed, 72 percent of total production was available to be sold outside of the state (U.S. Department of Commerce 1984a). Fig. 5 illustrates Idaho milk production changes, along with total milk marketed by producers, over the 1970 to 1983 period. The difference between these two categories includes milk used on the farm or sold directly to consumers.

Per capita U.S. consumption of different dairy products over time is illustrated in Figs. 6 to 10. As is well known, butter consumption declined precipitously as margarine took over the market. Per capita butter consumption was 18.6 pounds in 1934. By 1972 it had fallen to 5 pounds per capita and has fluctuated around that level since then.

Table 4. Dairy products manufactured: Idaho, 1978-83 (Idaho Agricultural Statistics 1983; USDA, ERS 1984f).

Product	1978	1979	1980	1981	1982	1983
	(1,000 pounds)					
Creamery butter	7,214	7,516	11,302	14,245	14,366	18,093
American cheese	67,981	72,076	82,487	94,187	103,811	107,266
Cheddar	26,817	33,274	38,952	46,197	54,751	60,493
Other[1]	41,164	38,802	43,535	47,990	49,060	46,773
Other cheese	24,830	25,923	26,864	28,338	31,955	29,136
Total cheese	92,811	97,999	109,351	122,525	135,766	136,402
Cottage cheese						
Curd	2,353	2,374	2,270	2,416	2,295	2,283
Creamed	3,142	3,032	3,020	3,119	2,945	3,051
Low fat	769	738	764	904	916	974
Dried skim milk						
Human food	7,523	7,599	14,288	22,225	27,689	32,772
	(1,000 gallons)					
Frozen products						
Ice cream	3,257	3,216	2,636	3,069	3,840	4,267
Ice milk	1,507	1,324	1,128	1,226	1,184	1,384
Sherbet	169	172	123	146	199	217
Mix produced						
Ice cream	1,684	1,679	1,401	1,323	1,664	1,924
Ice milk	705	676	531	606	618	784
Milk sherbet	120	124	88	112	129	129

[1]Includes Colby, washed or stirred curd, Monteray or Jack.

During the same time that butter consumption was declining, per capita consumption of American cheese increased from 3 pounds in 1930 to more than 11.6 pounds in 1983. Consumption of other types of cheese has made similar increases.

Consumption of evaporated and condensed milk reached a peak of about 20 pounds per capita after World War II. But, it has fallen to around 3 pounds per person for each of the past 5 or 6 years.

Ice cream consumption has levelled off at about 17 or 18 pounds per person per year. It has maintained that mark since the 1940s.

Consumption of fluid milk and cream products reached a peak of 399 pounds per capita in 1945.

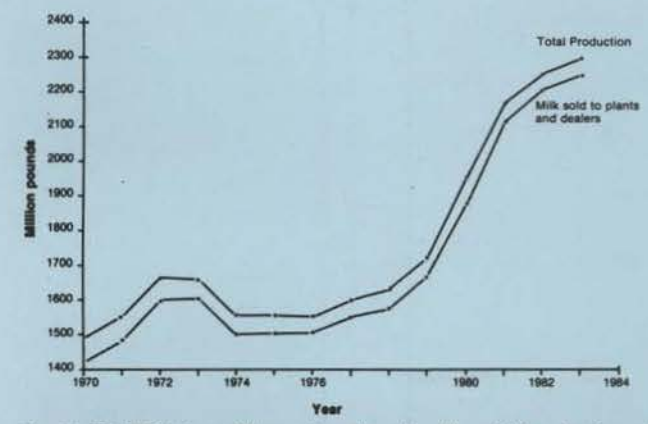


Fig. 5. Total Idaho milk produced and milk sold to plants and dealers, 1970-1983 (Idaho Agricultural Statistics 1983).

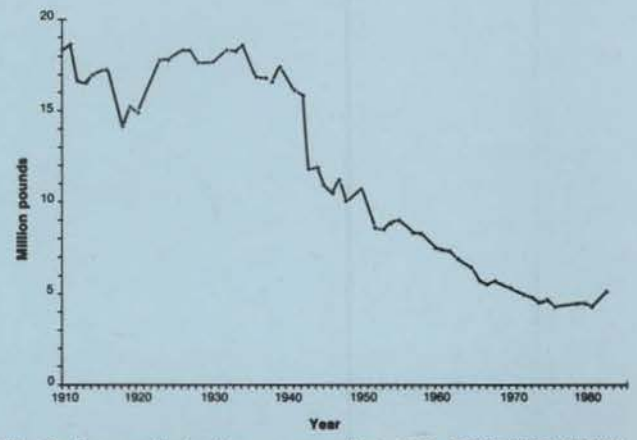


Fig. 6. Per capita butter consumption, U.S., 1910-1983 (USDA, ERS 1984c).

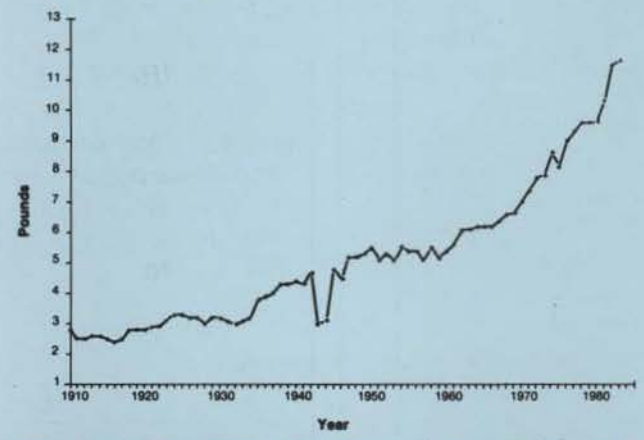


Fig. 7. Per capita consumption of American cheese, U.S., 1910-1983 (USDA, ERS 1984c).

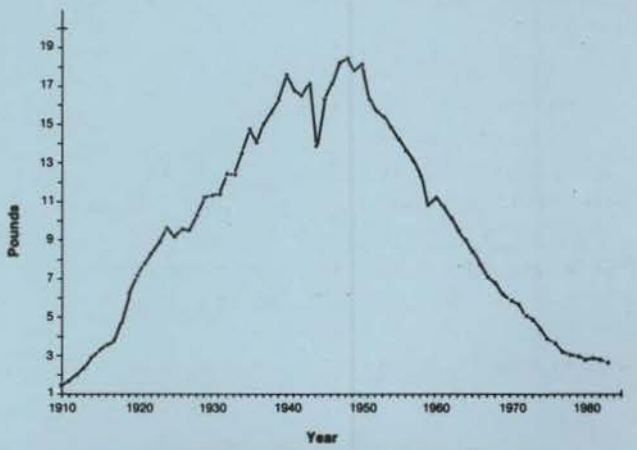


Fig. 8. Per capita consumption of evaporated and condensed milk, U.S., 1910-1983 (USDA, ERS 1984c).

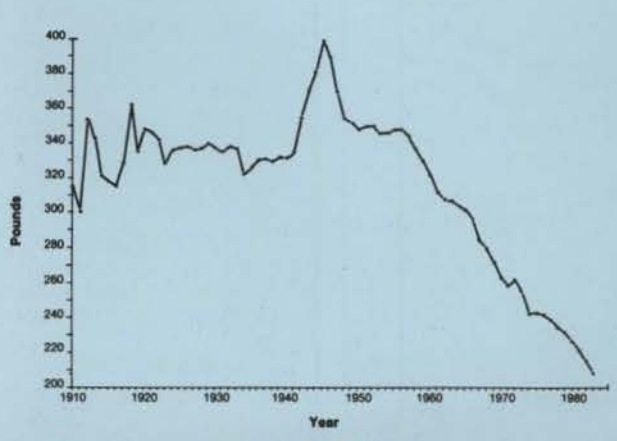


Fig. 9. Per capita consumption of fluid milk and cream, U.S., 1910-1983 (USDA, ERS 1984c).

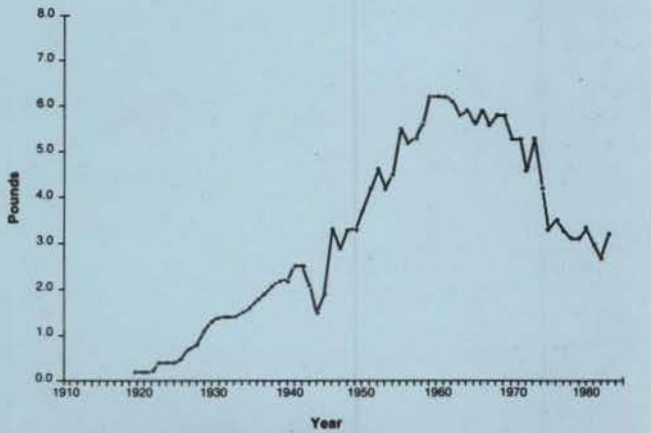


Fig. 10. Per capita consumption of nonfat dry milk, U.S., 1920-1983 (USDA, ERS 1984c).

Since then, it has gradually declined to the present level of about 210 pounds for each person.

Nonfat dry milk reached a consumption peak of over 6 pounds per capita about 1960. Since then, it has fallen to around 3 pounds per person.

Cheese has been the mainstay of the milk manufacturing industry in recent years. Table 5 shows changes for selected products between 1970 and 1983. Note that increases have occurred in cheese and lowfat milk. Declines appeared in whole milk, butter and nonfat dry milk.

Milk Prices in Idaho

Two groups of Idaho citizens are vitally interested in milk prices: consumers and dairy farmers. Consumers want to obtain the greatest value for money expended, and producers want to get the best possible return for milk sold. In reality, there is also a third group in between the farmers and consumers. These people are interested in obtaining a return on the investment and services provided in getting the milk from the producer to the consumer. The marketing group is not so concerned about milk prices as they are in the differences between prices paid for the raw product and prices received for the item in the retail market.

Retail Prices for Milk

Consumers buy milk in many forms and in many sizes of containers. The dairy case at the local supermarket has a variety of products and is usually located at the rear of the store. Because milk is purchased often, it is placed so that buyers will walk past many other items to get it. The hope is that the customer will not only buy milk but other items as well while passing through the store.

Milk is retailed primarily in plastic gallon jugs or in a variety of paper cartons ranging from one-half pint up to one gallon in size. Since fresh milk is a perishable product, it must be refrigerated and sold within a few days of production. That means that the dairy case must be rotated regularly and old milk removed or sold at reduced prices on or before the expiration date.

Table 5. Changes in per capita commercial use of dairy products, U.S., 1970 and 1983 (USDA, ERS 1984b).

Product	1970	1983	Change
	(lb)	(lb)	(%)
Whole milk	214.0	129.0	-40
Lowfat and skim milk	51.0	101.0	+98
Cream	5.3	5.9	+11
Butter	4.4	3.8	-14
Nonfat dry milk	3.3	1.8	-45
American cheese	6.8	8.9	+31
Other cheese	4.4	9.0	+104
Milk equivalent for all products	561.0	578.0	+3

Retail milk prices are based upon local competition, the cost of the product and the extent to which milk is used to attract traffic to the store. Some of the principal factors affecting retail prices are:

- Cost of the raw product;
- Processing and handling costs;
- Location of the retail outlet and the associated transportation cost;
- Prices charged by competing firms in the area;
- Volume of product handled;
- Cost of retailing the product.

Retail prices in retail grocery stores at several Idaho locations have been recorded at various times to determine whether there are price differences between locations and types of stores.

Besides home delivery and milk picked up by the consumer directly from the producer, milk was sold in 165,000 retail grocery stores in the U.S. in 1981 (Walzer 1982) (see Table 6). Additional milk was sold by restaurants, vending machines and used by various public and private institutions.

Total sales from grocery stores amounted to $241 billion in 1981. Chain stores, with less than 12 percent of the total number of stores, sold about 50 percent of the total value of products. Convenience stores sold less than 6 percent. We noted earlier that 12.6 percent of food sales was for dairy products in 1981. Dairy products make up a very important category in grocery store sales.

Retail Prices of Milk in Idaho

The geography of Idaho divides the state into several milk markets. Northern Idaho is associated with eastern Washington in various types of trade and commerce including milk markets. The Inland Empire federal milk marketing area includes this region.

Southwestern Idaho is tied to eastern Oregon geographically and also relates to the Magic Valley in southcentral Idaho. Southwestern Idaho is included in the Southwest Idaho-Eastern Oregon Milk Marketing Order. Southeastern Idaho is included in the Great Basin marketing area that also covers most of Utah.

Table 6. Grocery stores, sales and proportion of sales by affiliation, U.S., 1981 (Walzer 1982).

Affiliation	Number of stores	Percent of total	Sales	Percent of total sales
			(million $)	
Independent	108,130	65.5	$106,875	44.4
Chain	19,070	11.6	119,905	49.8
Convenience store[1]	37,800	22.9	14,120	5.8
Total	165,000	100.0	$240,900	100.0

[1]Excludes gasoline sales.

With such diverse and somewhat separated markets, one would suspect that consumer prices for milk and milk products would be quite variable throughout the state. Consumer prices for milk at most major cities throughout Idaho were recorded during June of 1980, 1981 and 1982. In each case, prices were all recorded within the same week to reduce the chance of price change over time. No special or sale prices were recorded. Prices were recorded for half gallon and gallon containers of homogenized whole milk, butter and mild cheddar cheese.

The market for dairy products appeared to be quite competitive in most markets in spite of the fact that milk was differentiated by different brands and there was a small number of sellers in each market. Branding was also prominent for butter and cheese. One would expect rather uniform prices to prevail in a competitive market with price differences to allow only for quality, packaging differences, volume of sales or location. This is because, in a competitive market, there are several sources of supply so that no one can charge more than the going price. If the price differences between locations are greater than transfer costs, the product moves between markets until price differences are reduced. If the quality of the product is uniform, then this will not be an important factor in price differences.

The products were not sampled for quality factors, but there were no observable differences besides brand name. Volume of sales did not appear to be a price factor in stores surveyed. Location, then, was the only apparent difference to account for price differences.

Because milk production and processing take place throughout the state and transportation facilities have become quite efficient, price differences caused by location were not apparent. For example, prices at Salmon, Idaho, were not different from prices in the upper Snake River Valley even though its location is somewhat remote. Some smaller towns in remote areas did charge higher prices than the rest of the state. Retail prices varied more between brands in some stores than it varied geographically throughout Idaho.

Retail milk prices in grocery stores did increase over the period of the survey. Table 7 shows the rate of increase for different areas of the state. Percentage increases were higher in southern Idaho than in northern Idaho between 1980 and 1982. Northern Idaho prices were above those in the southern Idaho in 1980, however, so that by 1982 prices in northern Idaho were closer to southern Idaho prices.

Price increases in southern Idaho averaged higher for one-half gallon cartons than for gallon containers over the period studied. Gallon containers increased from 5 to 13 percent while the price of one-half gallon cartons increased from 9 to 19 percent over the same period. In northern Idaho, both container sizes increased from 4 to less than 10 percent. Producer prices for the same period increased about 5 percent.

During the 3 years of the survey of retail prices, some interesting observations were made. Many stores in southwestern and southcentral Idaho sold both in-store brands and local dairy brands of milk. The local dairy brand was often considerably higher per gallon than in-store brands. Southeastern Idaho stores also had store brands and local brands, but there was little or no difference in these prices. It was reasoned that retailers of milk recognized a consumer loyalty to local brands and took advantage of this. This is conjecture, however, since no analysis was made of this occurrence.

Milk prices in small convenience stores were usually competitive with local supermarkets indicating that milk may be used to attract customers into these stores. No patterns of prices for butter and cheese were observed except they were slightly higher in convenience stores and in remote areas than in larger towns and in supermarkets.

Raw milk was sold in some stores, but no attempt was made to evaluate the prices. Milk prices at dairy drive-ins, gasoline stations or other outlets were also not recorded or evaluated in this study.

One conclusion that may be drawn from the price survey is that the customer often has several options for milk purchase. Also, careful shopping could reduce milk expenditures without sacrificing quality.

Producer Milk Prices

Milk prices are ultimately determined by the market for dairy products. These prices are influenced at times by the established support price. Market

Table 7. Retail milk price changes in Idaho grocery stores, June 1980 to 1982.

Area	Percent increase 1980-1982	
	Gallon containers	½ gallon containers
Northern Idaho Coeur d'Alene Moscow Lewiston Grangeville	4 to 7	4 to 9
Southwestern Idaho Boise Caldwell Mountain Home	5 to 11	11 to 13
Southcentral Idaho Jerome Twin Falls Burley	8 to 13	9 to 14
Southeastern Idaho Pocatello Blackfoot Idaho Falls Rexburg	5 to 10	9 to 19

milk prices are influenced by the support price a great deal during periods of large surpluses when the government purchases substantial quantities of dairy products. When milk prices exceed the support price and there are no government purchases under the support program, prices are established by the market. Table 8 compares milk support prices with market prices from 1949 through 1983.

Table 8. Manufacturing milk: Comparisons of announced support prices and U.S. average market prices paid to producers (USDA, ERS 1984b).

Marketing year beginning in...[1]	Date effective[2]	Support level			Average market level		
		As a percentage of parity equivalent				As a percentage of parity equivalent	
		Minimum	Announced[3]	Price per 100 pounds	Price per 100 pounds	In month before marketing year	Average during marketing year
		(%)	(%)	($)	($)	(%)	(%)
1949	1/01/49	90	90	3.14	3.14	90	89
1950[4]	1/01/50	75	81	3.07	3.35	88	85
1951		75	86	3.60	3.97	94	93
1952		75	90	3.85	4.00	93	95
1953		75	89	3.74	3.46	83	84
1954		75	75	3.15	3.15	75	80
1955		75	80	3.15	3.19	81	82
1956		75	82	3.15			
	4/18/56	75	84	3.25	3.31	86	84
1957		75	82	3.25	3.28	83	82
1958		75	75	3.06	3.16	77	77
1959		75	77	3.06	3.22	81	81
1960		75	76	3.06			
	9/17/60	80	80	3.22			
	3/10/61	80	85	3.40	3.31	83	82
1961		80	83	3.40	3.38	83	82
1962[5]		75	75	3.11	3.19	76	76
1963		75	75	3.14	3.24	77	77
1964		75	75	3.15	3.30	77	78
1965		75	75	3.24	3.45	80	79
1966		75	78	3.50			
	6/30/66	75	90	4.00	4.11	92	90
1967		75	87	4.00	4.07	88	87
1968		75	89	4.28	4.30	90	87
1969		75	83	4.28	4.55	88	86
1970		75	85	4.66	4.76	87	85
1971		75	85	4.93	4.91	85	82
1972		75	79	4.93	5.22	84	80
1973	3/15/73	75	75	5.29			
	8/10/73	80	80	5.61	6.95	99	91
1974		80	81	6.57			
	1/04/75	80	89	7.24	6.87	85	78
1975		75	79	7.24			
	10/02/75	75	84	7.71	8.12	89	84
1976		75	80	8.13			
	10/01/76	75	81	8.26	8.52	84	82
1977[6]	4/01/77	75	82	9.00[7]	8.77	80	80
1977		80	82	9.00			
	4/01/78	[8]	87	9.43	9.30	85	79
1978		80	80	9.87			
	4/01/79	[8]	87	10.76	10.86	88	80
1979		75	80	11.49			
	11/28/79	80	80	11.49			
	4/01/80	[8]	87	12.36	11.75	82	76
1980		80	80	13.10	12.71	78	73
1981		75	75	13.49			
	10/21/81	73	73	13.10	12.66	70	68
1982	10/01/82	69	69	13.10	12.66	67	64
1983		65	65	13.10			
1983	12/01/83	62	62	12.60			

[1]Start of marketing year April 1, from 1951 to 1976, and October 1, from 1977 to present.

[2]If other than start of year.

[3]The actual percentage of the parity equivalent price published in the month before the marketing year. In some cases the announced percentages, based on forward estimates of parity, were slightly different.

[4]Jan. 1, 1950 to March 31, 1951.

[5]Beginning November 1962, parity equivalent is based on prices for all manufacturing grade milk instead of the "3-product" price for American cheese, evaporated milk and the butter-nonfat dry milk combination used before.

[6]April-September transition period.

[7]Adjusted to annual average fat test.

[8]Mandated semiannual adjustment to reflect changes in the prices paid index.

Since 1979, the market price has consistently been below the support level. One should also be aware that the support price applies only to manufacturing milk. Fluid prices, however, are indirectly affected in that the fluid price is based on the manufacturing milk price plus an added differential to cover the extra cost and handling required for fluid milk products.

Milk prices have been largely related to the Minnesota-Wisconsin price in past years. This is the price established by cheese, butter and powder plants in the two states. The manufacturing milk price would be the Minnesota-Wisconsin price with adjustments for location of the farm relative to the processing plant, volume of milk sold, composition of the milk (butterfat and sometimes protein) and other factors. Fluid milk prices are affected by the same factors in addition to price adjustments under federal or state marketing orders. In recent years, many milk processors have been changing to component pricing including protein or pricing on a yield basis. For example, with cheese yield pricing the price for milk is determined by the amount of cheese that can be produced from the milk. Yield relates to milk solids including the amount and quality of protein and also to the fat content. This method has been enhanced by better and more efficient tests for various milk components.

As of Jan. 1, 1984, there were 45 federal milk marketing orders in the United States. These orders regulated the pricing and handling of about 70 percent of all milk sold to plants and dealers and about 81 percent of the Grade A milk marketed in the U.S. Currently, about 85 percent of the nation's milk supply is Grade A, and an average of 45 percent of this is used for fluid milk products (USDA, ERS 1984a). Only Grade A quality milk is regulated by federal milk orders.

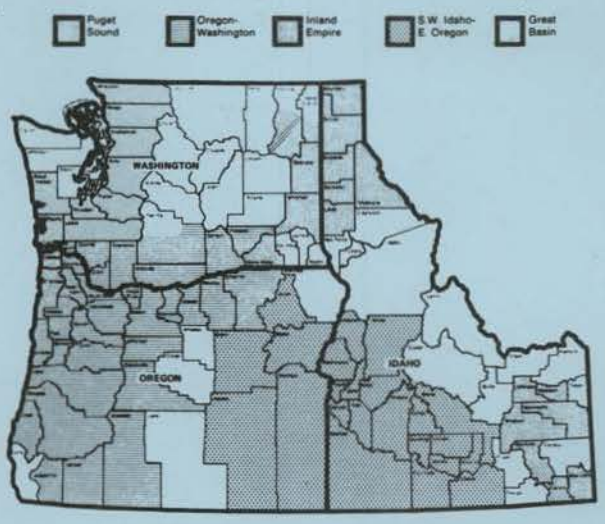


Fig. 11. Federal order marketing areas in the northwestern states (Burger 1981).

Most of Idaho's milk is served by Federal Milk Marketing Orders since the establishment of the Southwest Idaho - Eastern Oregon Federal Milk Marketing Order. As of 1983, however, only about half of Idaho's milk was Grade A, compared with an average of 85 percent for the nation. Fig. 11 shows the areas of the three Pacific Northwest states that are included under milk marketing orders, following the establishment of the Southwest Idaho - Eastern Oregon Federal Milk Marketing Order.

Federal milk marketing orders use classified pricing. All milk regulated is Grade A, but only part of this is used for fluid purposes. Only milk used for fluid receives the Class I price. All other milk goes into Class II or Class III and receives a much lower price. The producer is paid a blend price in most orders. The blend price is a composite price established according to the use of milk in the marketing area. For example, if 30 percent of the milk went to fluid use or Class I, 20 percent was Class II and the remaining 50 percent was Class III the blend price could be found as follows, using the assumed prices given.

Class	Price		Percentage use		
I	$14.00	×	30	=	$ 4.20
II	12.20	×	20	=	2.44
III	12.10	×	50	=	6.05
			Blend price	=	$12.69

Each producer would receive the blend price of $12.69 per hundred weight of milk with adjustments for butterfat, volume, location, etc. Some cooperatives are allowed to adjust individual producer blend prices according to a quota system that may have been established before the marketing order. Note also that the blend price increases as the percentage used for fluid increases. Some orders also have seasonal price adjustments to encourage more uniform production throughout the year.

The figures that follow give average prices for the United States and for Idaho for all milk, milk used for fluid or Class I and for manufacturing milk. Fig. 12 shows average annual milk prices for the U.S.

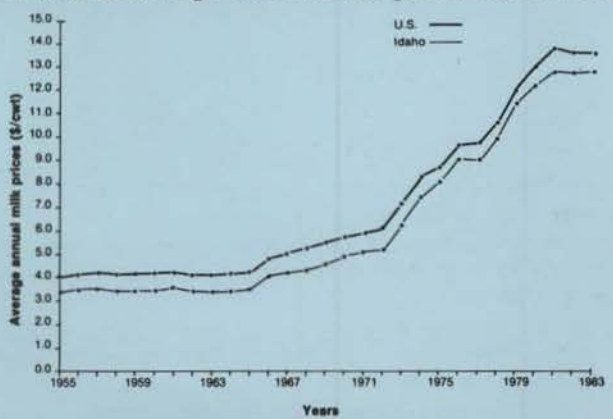


Fig. 12. Average annual milk prices for U.S. and Idaho, 1955-1983 (USDA, ERS 1984).

and Idaho from 1955 to 1983. The Idaho price is lower primarily because of the lack of a market for fluid milk. This means that most of the milk produced in Idaho is processed into manufactured products that can be stored and shipped more easily.

Prices for fluid milk compared to manufacturing milk for the United States are shown in Fig. 13. These prices have usually differed by $1.00 to $1.50 per hundredweight during the 1955 to 1983 period. Fluid and manufacturing milk prices in Idaho are given in Fig. 14. The differences between these two are a little less for Idaho than for the nation.

There are still seasonal production patterns for milk in Idaho. Production tends to be highest in the late spring and early summer. Prices also correspond to production with prices highest during seasons of low production and low during the peak periods. Fig. 15 illustrates these relationships.

The preceding discussion has been written about existing prices for dairy products. To determine whether there has been an actual increase in milk prices, the all milk average price for the U.S. was deflated using the index of all food prices with 1967 as the base year. Fig. 16 gives the actual prices compared to deflated prices from 1950 to 1983. This shows that actual prices have not increased and may have even declined a little in recent years.

The Dairy Price Support Program

The prices of milk and butterfat have been supported in one form or another since 1949. The Agricultural Act of 1948 established support prices for milk and butterfat at 90 percent of parity for 1949. The Agricultural Act of 1949 required the Secretary of Agriculture to support milk and butterfat at such level between 75 and 90 percent of parity as he determined necessary to "assure an adequate supply." This was primarily done by the Commodity Credit Corporation (CCC) removing enough butter, cheese and nonfat dry milk from the market to bring market prices up to or near the announced support price. Support prices have been announced annually or more often. The support program was successful most of the time from its beginning up until late in the 1970s. During that period, price supports fluctuated between the allowable range of 75 and 90 percent of parity.

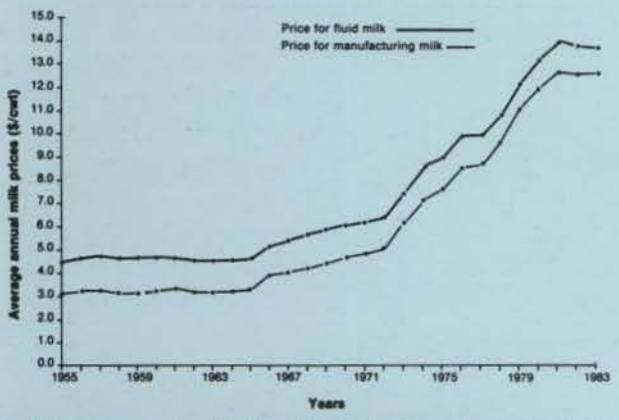


Fig. 13. Average annual prices for fluid milk and manufacturing milk, U.S., 1955-1983 (USDA, ERS 1984).

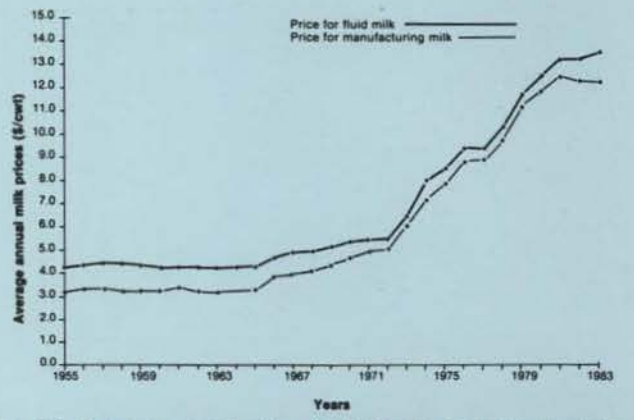


Fig. 14. Average annual prices for fluid milk and manufacturing milk, Idaho, 1955-1983 (USDA, ERS 1984).

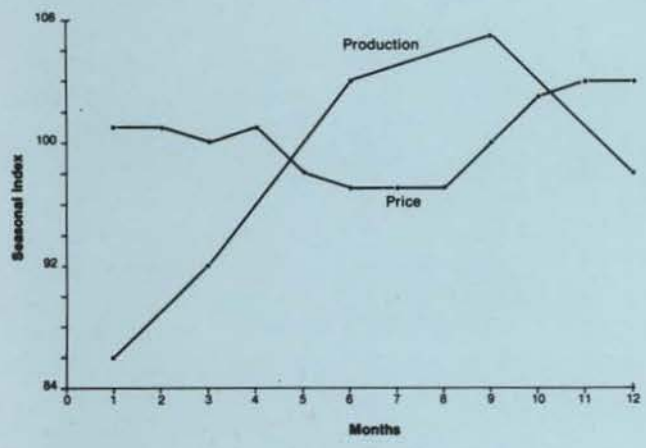


Fig. 15. Seasonal indexes for milk production and milk prices, Idaho 1979-1983 (Idaho Agricultural Statistics 1983).

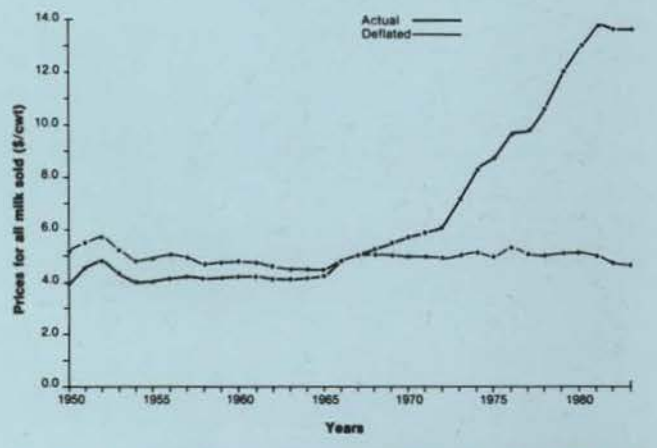


Fig. 16. Actual and deflated prices for milk, U.S. 1950-1983 (U.S. Department of Commerce and Council of Economic Advisors 1984).

General inflation during the latter part of the 1970s automatically increased the parity milk price and the support price along with it since the support was tied to parity. This brought about price rises that encouraged increased milk production. Production per cow continued to increase and, for the first time in many years, there was even an increase in cow numbers. By 1981, it was apparent that the problem would not vanish, and the price support was frozen at the 1980 level.

The 1982 legislation previously mentioned maintained this minimum price for at least until 1984 (this, however, was superceded by the Dairy and Tobacco Adjustment Act of 1983). It also provided that the Secretary of Agriculture could implement a deduction of $.50 per hundredweight of milk produced beginning Dec. 1, 1982. This money was to be paid by all producers and collected by those who pay dairy farmers for milk, usually handlers or dairy cooperative associations. An additional $.50 per hundredweight was to be levied April 1, 1983. The second $.50 was to be all or partly refunded to dairy farmers who **reduced** milk production.

The deduction program that began Dec. 1, 1982, was stymied shortly after by court rulings that proper action and approval had been circumvented and, therefore, was unconstitutional. Collections ceased until this problem could be resolved.

Because of accumulating stocks of dairy products, the support price established on Oct. 1, 1980, continued up until Dec. 1, 1983, without any additional increases. The 1949 Act was amended in September 1982 by the Omnibus Budget Reconciliation Act of 1982. Minimum support was set at $13.10 for milk with average butterfat of 3.67 percent ($12.80 for 3.5 percent) for the years beginning Oct. 1, 1982, and Oct. 1, 1983. The price was to be adjusted Oct. 1, 1984, to be the level of parity that $13.10 represented on Oct. 1, 1983 (USDA, ERS 1982).

Because of continuing surplus problems under the 1982 Act, however, new legislation was passed that took effect Dec. 1, 1983. This was called the Dairy and Tobacco Adjustment Act of 1983. The dairy support price was reduced from $13.10 per hundredweight to $12.60 for milk of average fat test (3.67 percent) and cannot be changed until April 1, 1985. In addition, dairymen are being assessed 50 cents per hundredweight on all milk marketed to be used to offset the cost of the diversion program. This brings the actual price down to $12.10 per hundredweight. The intent was to bring production levels more in line with national demand. The 1983 Act also authorized a 15 cent per hundredweight assessment on all milk marketed to support research and promotion of dairy products.

Dairy farm operators were allowed to signup for the diversion program from Jan. 16 until Jan. 31, 1984. They were allowed to signup for between 5 and 30 percent reduction from a base established from 1981 and 1982 production. Dairy farmers are paid $10 per hundredweight of reduction at the end of each quarter for complying with their contracted reduction. A substantial penalty is charged for those who do not comply with the program.

The signup for the diversion was considerably below the expected participation. About 12 percent of the nation's dairy farmers signed contracts to reduce milk production. The reduction contracted was about 9.3 billion pounds for the 15 month period of the program and amounts to about 5.5 percent of the milk supply for the 15 months of the diversion program (Jan. 1, 1984, to March 31, 1985). The other 88 percent of the dairy farmers are free to increase production if they choose.

The dairy diversion program should discourage additional increases overall and may actually bring about a decline. Also, the fact that milk prices have not increased since 1981 could be an even greater factor to discourage milk production increases.

Since about 1980, the market price has consistently been lower than the support price level. The support price was below 75 percent of parity by 1981 and in 1982 fell below 70 percent. Average market prices were still lower than the support price.

Favorable prices have, no doubt, been a significant factor in dairy surplus. Another probable cause has been general economic problems in agriculture. Dairying has been more dependable than most other alternatives so that there has been greater interest in it. At the same time, feed prices have been favorable to high milk production. Milk production per cow was 12,587 pounds in 1983, an increase of 3.4 percent over 1981, which was the highest on record at that time. Average Idaho milk production per cow was 12,948 pounds in 1982 and 13,207 pounds in 1983. The 1983 production per cow was 1.4 percent higher than in 1981 (USDA, CRB, SRS 1984).

Summary

Dairying is the fourth largest agricultural industry in Idaho. Besides producing milk with a farm value of $291 million in 1983, many people are involved in processing and marketing dairy products.

Dairy products make up 12.5 percent of consumer expenditures for food. The cost of dairy products has been increasing with most other items in the economy, but in terms of the amount of labor expended, there has been a large decrease in the cost.

The numbers of dairy cows in the U.S. and in Idaho have been declining for many years with the exception of a small increase between 1978 and 1983. Production per cow has increased dramatically. For example, production per cow in Idaho increased

from about 6,000 pounds per year in 1950 to more than 13,000 pounds in 1983.

Milk producing areas of Idaho are mostly concentrated in the irrigated areas of southern Idaho where feed is plentiful, and the climate is conducive to dairying. Because of the sparse population of Idaho and immediately surrounding areas, between 70 and 80 percent of Idaho's milk is manufactured into cheese, butter, nonfat dry milk powder and a few other products.

Retail milk prices in Idaho do not vary greatly from one part of the state to another. Prices are higher in a few isolated areas, but generally there is little difference in retail prices. Prices for different brands within stores often differed more than prices between stores.

Producer prices for milk were lower in Idaho than the U.S. average primarily because of the low utilization for fluid milk products. About three-fourths of Idaho's milk is manufactured into various products so that Class I prices are received for a very small portion. This lowers the average price received by the farmer.

Dairy price policies have an effect on Idaho milk prices just as they do for the U.S. Prices in terms of 1967 dollars have remained fairly constant since 1950. Milk prices have not increased since 1981.

The dairy industry has recently begun a painful adjustment to reduce surplus stocks and government purchases. It is anticipated that production will be reduced and equilibrium will again return after this adjustment has been made.

Literature Cited

1. Burger, James A. 1981. Market administrators report for federal orders no. 124, 125 and 133. USDA, Bul. 6, No. 6, June.
2. Council of Economic Advisors. 1984. Economic indicators. U.S. Govt. Print. Of., Washington, DC, July.
3. Employment status. 1977. Census of Manufactures. Idaho Dept. of Commerce, Boise
4. Idaho Agricultural Statistics. 1983. Idaho Crop and Livestock Reporting Service, Boise.
5. Idaho Department of Health and Welfare. 1980. Rules governing milk and milk products standards. Bureau of Preventive Medicine, Boise.
6. U.S. Department of Agriculture, Agricultural Marketing Service. 1957. Dairy statistics. Statistical Bul. No. 219, October.
7. U.S. Department of Agriculture, Crop Reporting Board, Statistical Reporting Service. 1984. Milk production, disposition and income. Da 1-2(84)
8. U.S. Department of Agriculture, Economic Reporting Service. 1982. Dairy outlook and situation. DS-391, December.
9. U.S. Department of Agriculture, Economic Reporting Service. 1983. Dairy outlook and situation. DS-390, September.
10. U.S. Department of Agriculture, Statistical Reporting Service. 1984. Agricultural prices, Annual summary. Crop Reporting Board, Washington, DC, 1960-1983.
11. U.S. Department of Agriculture, Economic Reporting Service. 1984a. Dairy: Background for 1985 farm legislation. Ag Info Bul. No. 219, September.
12. USDA, ERS. 1984b. Dairy: Background for 1985 farm legislation. Ag Info Bul. No. 474, September.
13. USDA, ERS. 1984c. Dairy outlook and situation. DS-396, March.
14. USDA, ERS. 1984d. Dairy outlook and situation. DS-397, June.
15. USDA, ERS. 1984e. Dairy outlook and situation. DS-398, September.
16. USDA, ERS. 1984f. Dairy products, 1983 summary. Crop Reporting Board, May.
17. USDA, ERS. 1984g. Economic indicators of the farm sector: Costs of production, July.
18. U.S. Department of Commerce. 1979. Census of Retail Trade. Bureau of the Census. U. S. Govt. Print. Of., Washington, DC
19. U.S. Department of Commerce. 1983. 1982 Census of Agriculture. Bureau of Census. U.S. Govt. Print. Of., Washington, DC.
20. U.S. Department of Commerce. 1984a. Current population reports, estimates of the population of states. Bureau of Census. U.S. Govt. Print. Of., Washington, DC. P25-925, January.
21. U.S. Department of Commerce. 1984b. Statistical abstract of the United States, 1981. Bureau of Census. U.S. Govt. Print. Of., Washington, DC.
22. Edgar Walzer (publisher). 1982. Progressive Grocer, April.

Appendix Tables

Appendix Table 1. Milk production and factors affecting supply, U.S., selected years, 1955-84.

Year	Milk cattle on farms, January 1[1]: Milk cows and heifers that have calved	Milk cattle on farms, January 1[1]: Milk cow replacements; heifers 500 lb and more, Total	Milk cattle on farms, January 1[1]: Milk cow replacements; heifers 500 lb and more, Per 100 cows	Milk cows on farms, average during year	Milk production, Per cow	Milk production, Total	Average prices received by farmers per 100 pounds: All milk, wholesale	Average prices received by farmers per 100 pounds: Milk eligible for fluid market	Average prices received by farmers per 100 pounds: Milk, manufacturing grade
	(000)	(000)	(no.)	(000)	(lb)	(mil. lb)	($)	($)	
1955	21,320	6,832	32.0	21,044	5,842	122,945	4.01	4.53	3.15
1960	17,650	5,686	32.2	17,515	7,029	123,109	4.21	4.70	3.25
1965	15,380	4,780	31.1	14,953	8,305	124,180	4.23	4.63	3.34
1966	14,490	4,450	30.7	14,071	8,522	119,912	4.81	5.17	3.97
1967	13,725	4,215	30.7	13,415	8,851	118,732	5.02	5.43	4.06
1968	13,115	4,080	31.1	12,832	9,135	117,225	5.24	5.67	4.22
1969	12,550	3,990	31.8	12,307	9,434	116,108	5.49	5.87	4.45
1970	12,091	3,880	32.1	12,000	9,751	117,007	5.71	6.05	4.70
1971	11,909	3,843	32.3	11,839	10,015	118,566	5.87	6.19	4.86
1972	11,776	3,828	32.5	11,700	10,259	120,025	6.07	6.38	5.08
1973	11,622	3,872	33.3	11,413	10,119	115,491	7.14	7.42	6.20
1974	11,297	3,941	34.9	11,230	10,293	115,586	8.33	8.66	7.13
1975	11,220	4,087	36.4	11,139	10,360	115,398	8.75	9.02	7.63
1976	11,071	3,956	35.7	11,032	10,894	120,180	9.66	9.93	8.56
1977	10,998	3,887	35.3	10,945	11,206	122,654	9.71	9.96	8.70
1978	10,896	3,886	35.7	10,803	11,243	121,461	10.58	10.79	9.65
1979	10,790	3,932	36.4	10,743	11,488	123,411	12.03	12.23	11.10
1980	10,779	4,158	38.6	10,810	11,889	128,525	13.05	13.21	12.05
1981	10,860	4,345	40.0	10,919	12,177	133,013	13.76	13.94	12.73
1982	11,012	4,532	41.2	11,026	12,316	135,795	13.59	13.73	12.66
1983[2]	11,076	4,533	40.9	11,086	12,531	138,917	13.56	13.72	12.62
1984[2]	11,140	4,541	40.8	NA	NA	NA	NA	NA	NA

NA = Not available.

[1]Before 1965, estimated by Livestock Section, Economic Research Service.

[2]Preliminary or estimated.

Appendix Table 2. U.S. milk production costs and returns per cwt, 1981-83 (USDA, ERS 1984g).

Item	1981	1982	1983
	($)	($)	($)
Cash receipts:			
Milk	13.69	13.52	13.60
Cull cows, calves and replacements	1.25	1.14	1.08
Total receipts	14.94	14.66	14.68
Cash expenses:			
Feed —			
Silage	.33	.33	.37
Concentrates	3.45	3.28	3.40
Hay	.80	.86	.87
Pasture and other forages	.04	.04	.04
Haylage	.23	.21	.22
Total feed costs	4.85	4.72	4.90
Other variable cash expenses —			
Milk hauling	.35	.34	.34
Artificial insemination	.11	.12	.12
Veterinary and medicine	.20	.20	.21
Livestock hauling	.02	.02	.02
Marketing	.10	.11	.11
Fuel, lube and electricity	.40	.40	.37
Machinery and building repairs	.35	.37	.38
Hired labor	.83	.87	.85
DHIA fees	.05	.05	.05
Dairy supplies	.19	.19	.19
Dairy assessment	NA	NA	.48
Total variable cash expenses	7.45	7.39	8.02
General farm overhead	.49	.57	.57
Taxes and insurance	.37	.35	.36
Interest	1.43	1.55	1.59
Total fixed cash expenses	2.29	2.47	2.52
TOTAL CASH EXPENSES	9.74	9.86	10.54
Receipts less cash expenses	5.20	4.80	4.14
Capital replacement	1.64	1.57	1.58
Receipts less cash expenses and replacement	3.56	3.23	2.56
Economic costs:			
Variable cash expenses	7.45	7.39	8.02
General farm overhead	.49	.57	.57
Taxes and insurance	.37	.35	.36
Capital replacement allowance	1.64	1.57	1.58
Allocated returns to owned inputs:			
Operating capital	.15	.12	.10
Other nonland capital	1.10	1.04	.95
Land	.37	.36	.36
Unpaid labor	1.46	1.51	1.46
TOTAL ECONOMIC COSTS	13.03	12.91	13.40
Residual to management and risk	1.91	1.75	1.28
Net returns to owned inputs	4.99	4.78	4.15

NA = Not applicable.

Appendix Table 3. Milk marketings and USDA net removals, 1960-83.

Year	Milk marketings[1]	Net removals[2]	
	(mil. lb)	(mil. lb)	(% mktgs.)
1960	115,266	3,115	2.7
1961	118,432	8,022	6.8
1962	119,465	10,748	9.0
1963	118,859	7,772	6.5
1964	121,054	7,677	6.3
1965	118,676	5,665	4.8
1966	114,801	645	.6
1967	113,976	7,427	6.5
1968	112,788	5,150	4.6
1969	111,966	4,479	4.0
1970	113,109	5,774	5.1
1971	114,814	7,268	6.3
1972	116,487	5,345	4.6
1973	112,141	2,185	1.9
1974	112,385	1,346	1.2
1975	112,337	2,036	1.8
1976	117,221	1,236	1.1
1977	119,830	6,080	5.1
1978	118,796	2,743	2.3
1979	120,943	2,119	1.8
1980	126,187	8,800	7.0
1981	130,709	12,861	9.8
1982	133,452	14,282	10.7
1983	137,658	16,814	12.2

[1]Milk production less amount fed to calves and consumed on farms.

[2]Milk equivalent basis.

Appendix Table 4. Milk: Supply and utilization in all dairy products, U.S., 1960-84.[1]

	Supply						Utilization						
										Domestic disappearance			
			Beginning stocks			Total	Exports and shipments			Fed to		Civilian consumption	
Year	Production	Imports	Commercial	Government	Total	use	Commercial[2]	USDA[3]	Total	calves	Military	Total	Per capita
	(million lb)												(lb)
1960	123,109	604	3,730	430	127,873	122,473	887	142	1,029	2,548	2,532	116,364	653
1961	125,707	760	4,192	1,208	131,867	121,964	784	148	932	2,432	2,472	116,128	641
1962	126,251	795	4,992	4,911	136,949	124,793	796	922	1,718	2,330	2,969	117,776	641
1963	125,202	915	4,338	7,818	138,273	128,585	2,122	3,371	5,493	2,245	2,964	117,883	632
1964	126,967	830	4,132	5,556	137,485	132,195	3,478	3,976	7,454	2,152	3,007	119,582	632
1965	124,180	923	4,317	973	130,393	125,937	1,710	648	2,358	2,061	2,819	118,699	620
1966	119,912	2,791	3,918	538	127,159	122,300	907	301	1,208	1,980	2,376	116,736	604
1967	118,732	2,908	4,813	46	126,499	118,247	593	231	824	1,891	2,117	113,415	581
1968	117,225	1,780	4,258	3,994	127,257	120,550	814	957	1,771	1,821	3,295	113,663	577
1969	116,108	1,621	3,983	2,724	124,436	119,092	942	477	1,419	1,745	2,696	113,232	569
1970	117,007	1,874	3,798	1,447	124,126	118,323	949	41	990	1,702	2,419	113,212	561
1971	118,566	1,346	3,705	2,098	125,715	120,611	1,063	1,963	3,026	1,635	2,031	113,919	556
1972	120,025	1,694	3,565	1,539	126,823	121,325	1,263	884	2,147	1,624	1,671	115,883	558
1973	115,491	3,860	3,493	2,005	124,849	119,641	1,213	79	1,292	1,584	1,257	115,508	551
1974	115,586	2,923	4,732	476	123,717	117,831	1,133	25	1,158	1,558	1,137	113,978	539
1975	115,398	1,669	5,576	310	112,953	119,110	1,026	20	1,046	1,566	1,075	115,423	540
1976	120,180	1,943	3,719	124	125,966	120,257	1,004	23	1,027	1,567	1,013	116,650	540
1977	122,654	1,968	5,299	410	130,331	121,705	963	29	992	1,541	996	118,176	542
1978	121,461	2,310	4,916	3,710	132,397	123,668	927	51	978	1,497	977	120,216	545
1979	123,411	2,305	4,475	4,254	134,445	125,846	982	38	1,020	1,437	1,163	122,226	548
1980	128,525	2,109	5,419	3,180	139,233	126,274	932	56	988	1,395	1,067	122,824	544
1981	133,013	2,329	5,752	7,207	148,301	129,923	3,682	67	3,749	1,418	1,020	123,736	543
1982	135,802	2,477	5,398	12,980	156,657	136,596	3,955	644	4,599	1,506	1,371	129,120	562
1983[4]	139,968	2,616	4,603	15,451	162,638	139,982	1,484	1,608	3,092	1,500	1,307	134,083	578
1984[4]			5,246	17,412									

[1]Milk equivalent, fat-solids basis.

[2]Includes sales for dollars and government-to-government sales.

[3]Includes P.L. 480 and AID programs.

[4]Preliminary.