

## NATIONAL INCOME AND DEMAND FOR DAIRY PRODUCTS

By

Rainer Schickele, Agricultural Economist

### Production and Consumption Trends

1. **Total milk production and consumption** in the United States closely coincides year by year as the great bulk of milk output is currently consumed in the domestic market. From the mid-twenties to the beginning of the war, total milk production increased from 90 to 110 billion pounds, or about 20 per cent (with a slight drop during the mid-twenties largely caused by drought). During the same period, population increased by about 16 per cent, resulting in an increase in total per capita milk consumption of roughly 4 per cent, from 796 pounds per person in 1924 to 824 pounds in 1939.

During the war, milk production took a big spurt and stood at an all-time peak of 121 billion pounds in 1945, over 17 per cent above the 1935-39 average. During the war years, a substantial amount of dairy products was used for the armed forces, but since 1946 domestic consumers absorbed all available supplies at record prices. There can be little doubt that as long as the national economy continues running at full capacity, domestic consumers would take still larger amounts of dairy products at prices satisfactory to dairy farmers.

Among the major food groups, dairy products rank high from the viewpoint of potential demand expansion and nutritional requirements for improving the nation's diet.

2. **Fluid milk and cream consumption** remained remarkably stable between 1924 and 1941, around 350 pounds per person (in terms of milk equivalents). During the war, civilian consumption jumped up to 433 pounds per capita in 1945, to about 28 per cent above the 1935-39 average. This increase in fluid milk consumption was in part at the expense of butter, since butter production was greatly reduced in favor of condensed, evaporated and dried milk for the armed forces. Fluid milk and cream consumption in 1947 is estimated at 403 pounds per capita—which was absorbed at prices around 15-20 per cent above parity. It is likely that fluid milk consumption will retain this higher level (about 15 per cent above prewar) at satisfactory prices as long as the economy operates at or near full capacity.

3. **Butter** consumption showed a slight downward trend during the late twenties, and again during the late thirties, from around 18 pounds per person in 1924 to 16 pounds in 1941. During the war, butter consumption fell to 10 pounds in 1946, and stood at about 12 pounds in 1947. In view of the fact that the long-time trend in the demand for butter has been declining, and that for 5 years consumers have had to get along on 12 pounds or less per person per year, it might require substantially lower than present prices to induce consumers to absorb butter at the pre-war rate of 16-17 pounds.

4. **Cheese** consumption was remarkably steady from 1924 to 1933, but increased sharply from 4½ pounds to 6 pounds by 1942. After the war, this upward trend continued during 1946 and 1947 when it reached 7 pounds per capita.

5. **Evaporated milk** showed a very steady upward trend from 9½ pounds per capita in the mid-twenties to 16½ pounds in the early forties and 18 pounds in 1947. Demand can be expected to continue strong, and war-induced changes in food habits in Europe may continue and result in a growing export outlet for evaporated milk.

6. **Ice cream** experienced a spectacular increase in consumption, from 24 pounds per capita in 1935-39 to 58 pounds in 1946, but fell off slightly to 50 pounds in 1947 (in terms of net milk used). Further expansion in ice cream consumption would probably require substantial price re-

ductions; at present prices and national income, however, consumers can be expected to absorb between 40 and 50 pounds per capita, which is almost twice the pre-war rate.

### Income and Consumption

Dairy products are relatively expensive foods, compared with other sources of proteins, vitamins and fats. Consumption rates, therefore, vary closely with family income, particularly in the lower ranges of income.

All dairy products combined (excluding butter) show a strong increase in consumption from the lowest income groups to families in the middle income groups, as seen in table 1.

**Table 1.—Per Capita Consumption of Dairy Products (excluding butter) by Non-farm Family Income groups, 1935-36 and 1942.**

Income class (dollars)	Dairy Products (excluding butter)		Percent of Average	
	Consumption per capita	Expenditure per capita	Consumption	Expenditure
1936 <sup>1</sup>	<b>Lb.</b>	<b>Dol.</b>	<b>Cons.</b>	<b>Value</b>
0- 500 .....	181	7.09	52	41
500- 999 .....	292	13.98	84	81
1000-1499 .....	372	17.56	108	102
1500-1999 .....	385	19.86	111	115
2000-2999 .....	421	22.03	122	128
3000-4999 .....	452	24.40	131	141
5000-over .....	520	29.25	150	170
Average .....	346	17.25	100	100
1942 <sup>2</sup>				
0- 500 .....	369	18.41	85	67
500- 999 .....	373	20.23	86	74
1000-1499 .....	408	23.97	94	88
1500-1999 .....	461	28.20	106	103
2000-2999 .....	447	30.37	106	111
3000-over .....	462	32.53	106	119
Average .....	435	27.39	100	100

<sup>1</sup>Total income per family (money plus non-money income).

<sup>2</sup>Money income per family.

Source: Family Expenditure Studies of 1935-36 and 1942. U.S.D.A.

These data are extremely valuable for understanding the nature of the demand for dairy products. Three basic relationships are revealed by these figures.

**First**, notice how in 1936 the lowest income families had to get along with only about one-half the amount of dairy products as the average family, and how families with incomes of over \$5,000 consumed three times as much as the lowest income group. The rate of consumption increase is highest as family incomes move from the lowest to the middle income levels, and flattens out somewhat as incomes increase further. This means that **the greatest opportunities for expanding dairy consumption lie in the lower income families.**

**Second**, the range of variation in consumption is much greater during depression than during prosperity. In 1942, with nearly full employment and rising wages, the consumption rate in the lowest income groups was substantially higher than in 1936, while in the higher income groups there was only a slight difference between the prosperity and depression years. This means, that in 1936, the lower income families had to restrict their consumption to such an extent that milk prices had to drop below parity in order to induce the higher income families to absorb the milk supply, while in 1942 the lower income groups had sufficient purchasing power to greatly increase their consumption, so that an increased supply could be absorbed at above parity prices.

**Third**, during both periods, the variations in **expenditures** for dairy products were much wider than in consumption. In 1936, the highest income group spent over four times as much money for dairy products per capita as the lowest group, while in terms of pounds consumed it was only three times as high. Similarly, early in 1942, expenditures in the highest income group were nearly twice as large as in the lowest, while consumption was only about 1¼ times larger. This means that as incomes increase families switch to the higher-quality products, to premium milk, coffee and whipping cream, fancy cheeses, and ice cream.

As a general rule, the character of the dairy demand would indicate that the dairy industry would find it most profitable to expand the output of high-quality premium products during booms, and shift its emphasis to lower-priced mass-consumption products during depressions.

**Individual dairy products** show some interesting differences in their demand conditions. Table 2 indicates how selected dairy products respond in consumption to changes in family income.

**Table 2.—Consumption of Selected Dairy Products per Family per Week, by Non-farm Family Income Groups, 1942.**

Money income per family	Fluid milk (whole)		Butter		Cheese		Evap. milk	
	Consump- tion per family	Per- cent of Ave.	Con- sump- tion	Per- cent of Ave.	Con- sump- tion	Per- cent of Ave.	Con- sump- tion	Per- cent of Ave.
Dol.	Qts.	%	Lbs.	%	Lbs.	%	Lbs.	%
500 or less ..	4.1	50	.56	49	.24	38	1.1	92
500-1000 .....	5.8	71	.71	62	.35	55	1.5	125
1000-1500 .....	7.4	90	.95	83	.67	105	1.5	125
1500-2000 .....	8.6	105	1.16	102	.70	110	1.3	108
2000-3000 .....	9.6	117	1.27	111	.68	106	1.0	83
3000-over .....	10.7	130	1.66	146	.97	147	1.1	92
Average ....	8.2	100	1.14	100	.64	100	1.2	100

Source: U. S. Department of Agriculture, Family Food Consumption in the U. S., Spring 1942. Misc. Publ. No. 550, 1944.

**Fluid milk and butter** consumption rises strongly throughout the income range, while **cheese** consumption jumps quickly to the average level, remains fairly constant in the middle income groups, and takes another jump in the highest income group. Evaporated milk consumption does not seem to be markedly affected by income; in fact, it tends to decline in the higher income groups. These data suggest an important refinement of the general demand analysis presented above for dairy products in general: fluid milk and butter seem to be particularly sensitive to income changes, and probably ice cream as well, while cheese consumption in terms of pounds per person does not increase much throughout the range of the middle-income groups. A study of these relationships in consumer behavior should prove most helpful to the dairy industry in adjusting production and price policies to the ups and downs in consumer purchasing power.

### Size and Distribution of National Income

The demand for dairy products is strongly affected by the size of the national income, and by the manner in which it is distributed among the nation's families. The latter is even more important for dairy products than for many other foods (such as cereals or potatoes), because the consumption response to an income increase is particularly strong in the low-income families. If 100 dollars are added to the income of a \$2,000 family, a much larger proportion of that increase will be spent for dairy products than if the 100 dollars were added to an \$8,000 income. It is, therefore, clearly in the interest of the dairy industry, if an increase in the national income accrues chiefly to the lower-income groups, and if a decrease in the national income hits primarily the high-income groups.

Changes in the size of the national income, however, do not always occur that way. During the war, income in the lower brackets did rise relatively faster than in the higher levels, but since 1946, the opposite is likely to hold true. Decreases in the annual earnings of millions of workers (due to down-grading of jobs and elimination of over-time work) have been more than offset by increases in industrial profits, so that the increase in the national income since the beginning of 1946 went proportionately more to the higher-income groups (and to farmers). This change in the distribution of the national income is the chief source of concern for those who need to anticipate consumer demand for the next few years ahead in order to lay out their business plans and longer-time investments. Demand analyses such as we have just discussed should provide very useful hunches or even guides to businessmen in developing their plans for plant expansion, production and prices.

### Dairy Prices in Relation to Other Prices

Finally, some comments on the present position of dairy prices are needed to round out the picture. Consumption depends fully as much on prices as on income. Since the prices of the various dairy products are all quite closely inter-related, the simplest way of evaluating the current position of dairy prices relative to other prices might be to compare the actual farm prices of milk and butterfat with their parity prices on the one hand, and of the actual farm prices of other products with their respective parity prices on the other. The parity prices for farm products are those that would prevail if the respective product had the same purchasing power for the things farmers buy as it had during a certain base period.

There has been a great deal of argument concerning the fairness of the 1910-14 base for computing parity prices, and dairy farmers rightly point out that while this period might be all right for some farm products, it certainly is way out of date for dairy products. For this reason, Table 3 shows not only parity prices as now used, but also "modernized" parity prices based upon the last 10 year period (1936-47), and without or with wage rates included in the index of prices paid by farmers for the things they buy.

**Table 3.—Parity Prices of Selected Farm Products September 15, 1947 with Comparisons**

Unit	Actual U. S. Farm Prices		Parity Prices, Sept. 15, 1947 Modernized basis (1937-47)		
	Sept. 15, 1947	Dec. 15, 1947	Present basis	Without wages	With wages
Milk, wholesale \$ per cwt.	4.35	5.02	3.79	4.01	4.22
Butterfat .....¢ per lb.	84.0	87.7	62.3	63.0	66.5
Eggs .....¢ per doz.	53.0	58.7	51.0	44.8	47.2
Cattle .....\$ per cwt.	20.20	19.80	12.80	15.10	16.00
Hogs .....\$ per cwt.	27.20	24.90	17.20	17.20	18.10
Wheat .....\$ per bu.	2.43	2.79	2.10	1.70	1.79
Barley .....\$ per bu.	1.78	2.00	1.47	1.12	1.18
Corn .....\$ per bu.	2.40	2.37	1.52	1.34	1.42
Flaxseed .....\$ per bu.	6.18	6.67	4.01	3.63	3.82
Potatoes .....\$ per bu.	1.49	1.72	1.77	1.52	1.61

Source: U.S.D.A. Testimony before Congressional Committees in Agriculture, April 21 and October 6-8, 1947, Washington, D. C.

We can see readily, that at present farm prices for milk and butterfat are substantially above any of the three parity prices shown. This holds particularly for **butterfat**, which on September 15 was 35 per cent above legal parity, and December 15 about 40 per cent above. Even if the modernized parity price including wage adjustment were used, the farm price for butterfat on December 15 would still be about 30 per cent above such revised parity. The farm price for **milk** is not quite as much out of line with other prices. On September 15 it was 15 per cent above legal parity, or 4 per cent above the revised parity price including wages,

but by December 15, it had risen to about 30 per cent above legal parity, or 18 per cent above that revised parity. With respect to **butter**, I am inclined to doubt whether the December price level will be maintained throughout the winter.

Table 4 shows actual U.S. average farm prices in per cent of the legal parity and the revised parity prices (the latter including wages in the "prices paid" index), as of September 15, 1947, for major North Dakota farm products.

**Table 4.—Actual U.S. Farm Prices in Percent of Legal Parity Prices and of "Modernized" Parity Prices (including wages), September 15, 1947.**

	Farm prices in percent of	
	Legal parity price	Modernized parity price (incl. wages)
Milk, wholesale .....	115	104
Butterfat .....	135	126
Eggs .....	104	112
Cattle .....	157	126
Hogs .....	158	150
Wheat .....	116	136
Barley .....	121	150
Corn .....	158	169
Flaxseed .....	154	162
Potatoes .....	84	93

Where grain prices are boosted largely by extremely strong foreign demand, livestock and livestock product prices are mainly the result of domestic scarcities relative to U.S. consumer demand. The table would indicate that the supply of potatoes is ample to keep potato prices in line with most other prices. Egg and whole milk prices, at least as of last fall, also were not greatly out of line. But the price levels of butterfat, cattle and hogs are substantially higher than production cost and normal price relationships would call for, so that increased production can be expected during this year, with a corresponding retreat in relative prices later in the year and in 1949.

A great deal, of course, depends on continuing full employment and capacity production in our economy as a whole. These can be maintained only, however, if purchasing power is widely distributed among the nation's families, and if prices, especially of food and other essential goods, do not rise much further. Increases in food prices necessarily mean less buying of industrial goods, and lead ultimately to a decline in orders from the nation's factories, and to unemployment. Industrial exports may take up this slack for some time—but not indefinitely; they can only postpone the day of reckoning. It is clearly in the enlightened self-interest of farmers and agricultural processing industries to watch the course of rising food prices with concern and do whatever they can to hold it in check.