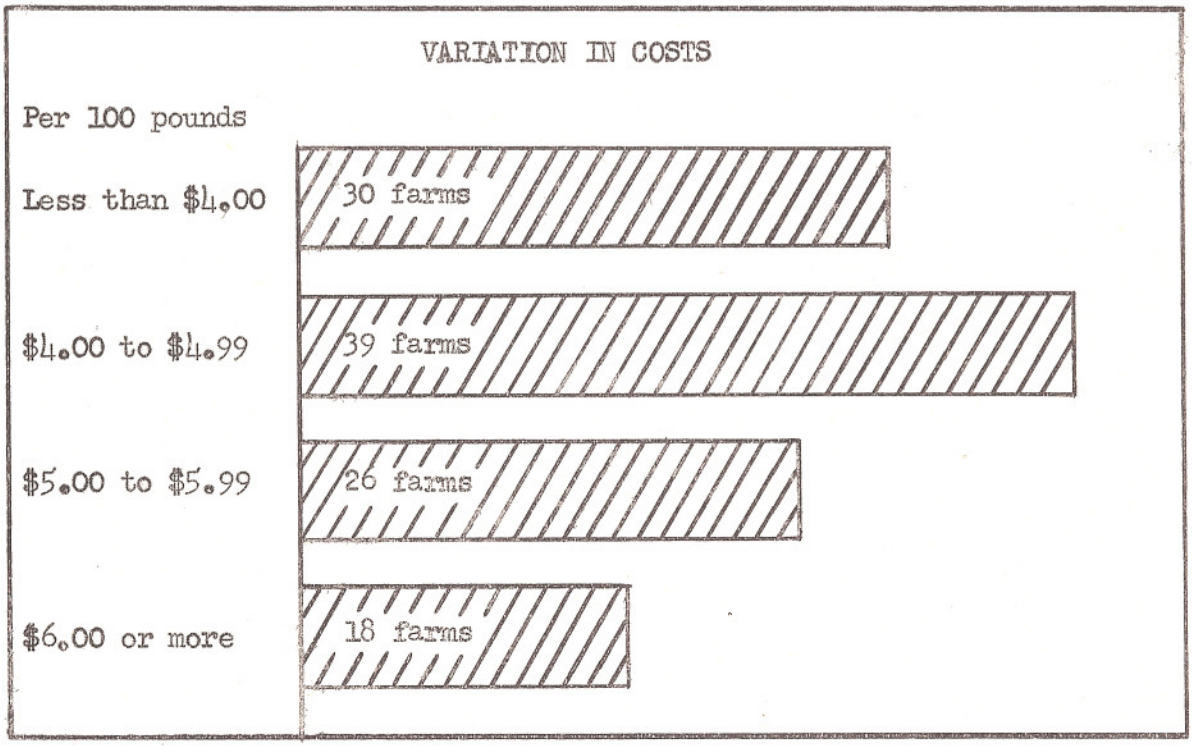
COSTS AND RETURNS IN PRODUCING MILK

Central Plain Region, New York

1953-54



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IN PRODUCING MILK

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Cost of milk production is a subject of continuing interest. Cost serves as a useful measure of production efficiency as well as a popular criterion of price. This bulletin reports a study of costs and prices in a group of farms located on the high and medium lime soils of western New York.

SOURCE OF DATA

Records of farm receipts, expenses, inventories and crop production were obtained on 371 commercial dairy farms located in the Central Plain Region of New York. Additional information about costs and returns in producing milk was obtained on every third one of these farms, 113 cost records in all. The records covered the 12-month period ended April 30, 1954. The dairy farm records are a part of a larger study of 525 commercial farms representing about a 10-per cent random sample of all farms in the Region. The survey method was used.

A commercial dairy farm is defined as one with six or more cows and 9 months or more of milk sales and whose operator's principal interest is farming.

COMPARISON OF COST FARMS WITH OTHER FARMS

The dairy farms on which cost-of-milk records were obtained and the other dairy farms were similar in average organization and income. The crop area per farm averaged about 125 acres in both groups, and the size of the labor force was about the same (table 1). The differences in average number of milk cows per farm was less than one cow. In each group, the capital investment amounted to about $40,000 per farm.

The use of labor was similar in the two groups and milk production per cow differed by only 170 pounds, or 2 per cent. Likewise, crop yields per acre were about the same.

Table 1. DAIRY FARM ORGANIZATION AND INCOME
113 Cost Farms and 258 Other Farms, Central Plain Region, New York
1953-54

Items	Average cost farms	Average other farms
Crop acres per farm	123	126
Man equivalent per farm	1.9	2.0
Milk cows per farm	22.9	22.1
Total capital per farm	$40,399	$40,378
Milk cows per man	12.0	11.3
Pounds of milk sold per man	95,541	91,925
Pounds of milk sold per cow	7,934	8,104
Tons of hay per acre	2.5	2.6
Tons of corn silage per acre	11	12
Bushels of wheat per acre	34	35
Labor income	$3,274	$3,074
Price received per 100 lbs. of milk	$4.43	$4.39

The average price received for 100 pounds of milk differed between the two groups by only 4 cents and the average labor income by only $200, or less than one per cent. Therefore, it is concluded that the cost data for the group of 113 farms are representative of the other 258 dairy farms as well, and that the entire sample of 371 farms is typical of all commercial dairy farms in the Region.

COSTS

Feed

The various costs in producing milk are grouped under 10 major headings, namely: feed, man labor, milk hauling, depreciation on cows, building use, interest on cows, bedding, equipment use, breeding, and miscellaneous. The returns other than the milk produced were treated as credits. These include values for calves and manure produced. These costs and returns apply to the milking herd alone; the heifers and bulls are treated as separate enterprises.

The amount of grains and other concentrates fed averaged nearly 3,000 pounds per cow (table 2). Two-thirds of this amount was homegrown and one-third was purchased. In addition the milk cows received on the average 2.4 tons of hay and 5.3 tons of silage, mostly corn, per cow. The average price charged for the homegrown grains, including largely corn and oats, was $55 per ton, whereas the average price paid for purchased feed, mostly high protein supplements, was $83 per ton. Hay was charged to the milking herd at $22 per ton, corn silage at $8 per ton and grass silage at $7 per ton.

Table 2. AMOUNT AND COST OF FEED
113 Dairy Farms, Central Plain Region, New York
1953-54

Items	Average per cow		Average per 100 pounds of milk produced	
	amount	value	amount	value
Concentrates				
Homegrown	1,946 lbs.	$ 53.05	23.1 lbs.	$0.63
Purchased	1,036 lbs.	43.21	12.3 lbs.	0.51
Hay	2.4 t.	52.69	57 lbs.	0.63
Silage	5.3 t.	41.03	126 lbs.	0.48
Pasture		17.06		0.20
Total		$207.04		$2.45

The pasture charge, including both regular pasture and aftermath grazing, averaged $17 per cow for the season. The total feed cost per cow for the year amounted to $207.

On the basis of 100 pounds of milk produced, feed requirements were: grain 35.4 pounds, hay 57 pounds and silage 126 pounds. The feed cost per 100 pounds of milk was $2.45.

Feed cost made up 51 per cent of the total cost of producing milk.

Sources of Nutrients

The amounts of nutrients per cow from the various barn-fed feeds were calculated by applying appropriate percentages of TDN to the amounts consumed. The TDN obtained from pasture was calculated as the residual amount unaccounted for out of the total TDN requirements per cow for body maintenance and milk production obtained from grain, hay and silage.

The proportion of the total nutrients from grain was 33 per cent and from hay 35 per cent (table 3). The grain percentage is higher than might be expected in this area of surplus roughage production. Apparently, the large homegrown grain production was condusive to liberal grain feeding. The comparatively small contribution from pasture is in line with the light summer rainfall.

Table 3. SOURCES OF NUTRIENTS FOR DAIRY COWS
113 Dairy Farms, Central Plain Region, New York
1953-54

Items	Pounds per cow	Per cent TDN	Pounds TDN per cow	Per cent TDN from each source
Grain	2,982	70	2,087	33
Hay	4,800	45	2,160	35
Silage	10,600	13.5	1,431	23
Pasture			582*	9
Total			6,260**	100

* Residual

** Assumed requirements: in pounds of TDN body maintenance per cow 3,560 pounds; milk production 2,700 pounds (0.32 times 8,439 pounds of milk).

Man Labor

The direct labor on cows, including milking, caring for the milk, feeding the cows, cleaning the stable and miscellaneous barn chores, amounted to 131 hours per cow, or 1.55 hours per 100 pounds of milk produced.

The average of 131 hours of labor per cow describes this situation in only a limited way. Actually, an unusually wide variation in time spent doing milking chores on different farms was found. Labor per cow was less than 100 hours on 28 of the 113 farms, but 150 to 199 hours on 26 farms and 200 or more hours on 15 other farms. Admittedly some of these differences may be due to the complexity of enumeration, but even so the milking job is done much more efficiently on some farms than other.

Variation in Man Hours per Cow

Range	Number of farms
Less than 100	28
100 to 149	44
150 to 199	26
200 or more	15
Total	113

The average rate charged for labor was 78 cents per hour. This rate was based on the cash wages paid to and farm privileges provided for hired help, wage allowances for family labor and estimated wage allowance and value of farm privileges of $3,000 for each farm operator. The total number of hours put in by each worker was enumerated. The total hours of all labor were divided into the total value of all labor to determine the hourly labor charge.

Total hours of all labor per farm	6,479
Total value of all labor per farm	$5,031
Average rate per hour	$0.78

The labor cost amounted to about $100 per cow, or $1.20 per 100 pounds of milk. Labor represented 25 per cent of the total cost of producing milk.

Depreciation on Cows

A decline in cattle prices began in the spring of 1952 and continued through the period covered by this study. In May 1953, the average price of dairy cows in New York was reported by the New York Crop Reporting Service to be $210 per head. By April 1954, the average price had fallen to $175 per head. In this study, however, cows were inventoried on the same price level at the beginning as at the end of the year.

The average inventory price of dairy cows amounted to $216 per head. At the time of freshening, heifers added to the herds were valued at $206 per head (table 4). Cow replacements that were purchased cost on the average $223 per head.

Cows sold from the herds averaged $137 each. About one-fourth of the cows in the herds were replaced during the year.

The loss or depreciation on cows amounted to $369 per farm, $16 per cow, or 19 cents per 100 pounds of milk produced. This item was 4 per cent of total costs.

Table 4. DEPRECIATION ON COWS
113 Dairy Farms, Central Plain Region, New York
1953-54

Items	Number per farm	Price per head	Value per farm
Beginning inventory	21.6	$216	$4,655
Heifers freshened	6.2	206	1,268
Purchases	1.4	223	323
Total	29.2		$6,246
Sales of cows	4.4	$137	$ 603
Deaths	0.3		—
Eaten	0.3		33
End inventory	24.2	$216	5,241
Total	29.2		$5,877
Depreciation per farm			$ 369
Depreciation per cow		$ 16.16	

Milk Hauling

Practically all of the dairymen hired their milk hauled. Milk for the New York market went to country plants. The milk for the Buffalo, Rochester, and Syracuse markets was delivered direct to city plants, on which hauling charges were somewhat higher.

Wide variations in hauling rates were found, but the average amounted to 21 cents per hundredweight of milk. This item accounted for 4 per cent of total production costs.

Other Costs

Building use amounted to about $15 per cow or 18 cents per 100 pounds of milk. Interest on investment in cows, equipment use and bedding charges were each about $10 per cow. About one ton of bedding per cow was used. Breeding costs averaged $6 per cow. Some $15 per cow of miscellaneous costs were incurred, including telephone and electricity, disinfectants, whitewash, veterinary service, medicines, milkhouse supplies, insurance, milk testing, registration and fly spray.

Net Cost

The costs of feed, labor and all other items amounted to about $400 per cow or $4.85 per 100 pounds of milk (table 5).

Table 5. NET COST OF PRODUCING MILK
113 Dairy Farms, Central Plain Region, New York
1953-54

Items	Average per cow	Average per 100 lbs. of milk
Total costs	$409.44	$4.85
Credits		
Calves	11.38	0.14
Manure	10.50	0.12
Total	$ 21.88	$0.26
Net cost	$387.56	$4.59

The credit for calves and manure produced each amounted to about $11 per cow. Thus the net cost of production averaged $388 per cow or $4.59 per 100 pounds of milk produced.

Variation in Costs

As in every previous study of this subject, a wide variation in costs on individual farms was found. Thirty farms, or about one farm in four, had net costs of less than $4.00 per hundredweight (see cover page). Another 39 farms had costs ranging from $4.00 to $4.99. Such moderately low costs reflect the changes in size of herd, use of labor, rate of milk production per cow, sources of nutrients and other adjustments made on some dairy farms to increase production efficiency. Still another 26 farms had costs ranging from $5.00 to $5.99. The remaining 18 farms, or one farm in eight, had costs of $6.00 or more. These high-cost farms were undoubtedly having great difficulties under such circumstances.

RETURNS

Average Returns

The actual butterfat test of the milk sold from all farms averaged 3.8 per cent. The pounds of milk for each farm were converted to the pounds equivalent of milk testing 3.7 per cent and all figures reported in this study are on that basis.

The rate of milk production averaged 8,439 pounds per cow. At the average price of $4.43 per 100 pounds, the value was $373. This return was $14 per cow short of the net cost.

On a per hundredweight of milk basis, the average price of $4.43 was 16 cents less than the average cost of production.

Stating the returns in another way, the dairymen in this Region realized, after paying all other costs of producing milk, 67 cents per hour on the average for all labor used directly in caring for cows during the period of this study.

Variation in Returns per Hour of Labor

As might be expected from the wide difference in costs on individual farms, some farms made much higher labor returns than others.

Twenty out of the 113 farms failed to make any return for labor used in producing milk. In contrast, 30 other farms made at least $1.00 an hour, and of these 30, 9 made $2.00 or more per hour. Progress in increasing efficiency in milk production has certainly not been uniform in this Region.

Returns per hour of labor	Number of farms
Less than -$.00	20
$0 to $.49	26
$.50 to $.99	37
$1.00 to $1.49	14
$1.50 to $1.99	7
$2.00 or more	9
Total	113

COSTS AND PRICES BY MARKETS

Forty-nine of the 113 farms produced milk for the New York market and the other 64 farms produced milk for upstate markets, principally Rochester, Buffalo and Syracuse.

Average production costs for the two market groups differed less than did the average prices received for milk. The New York market farms had an average cost per 100 pounds of milk 24 cents less than that of the upstate market group, but the New York price was 39 cents lower than the upstate market price (table 6). Many more dairymen were attracted to the Rochester and Buffalo markets than were permitted to deliver there.

Table 6. COSTS AND PRICES, BY MARKETS
113 Dairy Farms, Central Plain Region, New York
1953-54

Market	Number of farms	Average per 100 lbs. of milk cost	price
New York	49	$4.45	$4.19
Upstate	64	$4.69	$4.58

RELATIVE COSTS IN FIVE MAJOR DAIRY REGIONS

Numerous studies of dairy farms over the last 25 years show that average milk production costs differ in different dairy regions of New York State. Cost levels vary because of differences in land resources, markets, seasonality of milk production and other factors.

Five major dairy regions in the State have been defined and described. 1/ The Central Plain Region, the area of the present study, covers the broad belt of high and medium lime soils extending east and west across the western half of the State. The Hill Region comprises the south central plateau area in the southern tier of counties. The Valley Region, unlike the other regions of contiguous areas, is really a network of widely scattered valleys. The Lower Hudson Region includes the stony loam soils of Orange, Dutchess and Columbia Counties. The part of the St. Lawrence lowland extending from northern Jefferson County through St. Lawrence County to Franklin County forms the North Country Region. Other dairy areas of the State have not been studied in detail. About four-fifths of the total milk delivered to plants in New York State is produced in the five major regions just described.

Studies of a regional nature made by the College of Agriculture of dairy farms since 1930 include 437 records for 1930-31 in four counties, 2,015 records during 1934 to 1940 in some 30 counties, 177 records for 1942-43 in four counties, 220 records for 1949-50 in seven counties, in addition to the one for 1953-54 reported here.

1/ Commercial Dairy Farming in New York, by L. C. Cunningham. Cornell Experiment Station Bulletin 857, December 1949.

An over-all summary of all these studies indicates the following cost relationships by regions:

Region	Cost per cwt. of milk in per cent of state average	Average cost per 100 pounds of milk, 1953-54	
		actual	estimated
Hill	105		$5.02
Valley	99		4.73
Central Plain	96	$4.59	
Lower Hudson	110		5.26
North Country	94		4.49
State	100		$4.78

On the basis of an average cost of producing 100 pounds of milk of $4.59 in the Central Plain Region, the estimate for New York State is $4.78 for 1953-54.

SUMMARY

Data on costs and returns in producing milk were obtained by the survey method on 113 farms located in the Central Plain Region of New York. These farms were a subsample of every third one of the dairy farms in a 10-per cent sampling of all commercial farms in this Region. Financial records of the whole farm business were obtained for the entire group of farms.

On the cost farms, the average size of the milking herd was 23 cows, the rate of milk production was about 7,900 pounds sold per cow. The total capital investment amounted to $40,000 per farm.

The average feed cost amounted to about $200 per cow or $2.45 per 100 pounds of milk produced. The grain consumption per cow was nearly 3,000 pounds, of which two-thirds was homegrown. Roughage feeding per cow was 2.4 tons of hay and 5.3 tons of silage. Notwithstanding the liberal roughage supplies generally, grain and other concentrates accounted for one-third of the total nutrients. Feed was one-half of the total cost of milk production.

The direct labor on cows amounted to 131 hours per cow or 1.5 hours per 100 pounds of milk. Labor requirement per cow were highly variable from farm to farm. The charge for labor used in producing milk averaged 78 cents per hour, hence the labor cost was about $100 per cow. Labor was 25 per cent of the total cost.

Milk hauling, depreciation on cows and building use were each about $16 per cow, or 4 per cent of the total cost. Costs of about $10 per cow were accounted for by interest on cows, bedding and equipment use.

The net cost, after allowing for credits for calves and manure produced, amounted to $388 per cow or $4.59 per 100 pounds of milk. Unit costs ranged, however, from less than $4.00 per hundredweight on 30 of the farms to $6.00 or more on 18 other farms.

The average price received per 100 pounds of milk was $4.43, 16 cents less than the average net cost. Instead of the 78 cents per hour charged, the labor used on cows earned on the average 67 cents per hour. As with unit costs, a wide variation in return per hour of labor on different farms was found.

Compared with those producing milk for upstate markets, the 49 farms delivering milk to plants for the New York market had somewhat lower average production costs, but also received a still lower price for milk.

Average milk production costs in this Region are moderately lower than in most other major regions of the State.

AVERAGE COSTS AND RETURNS IN PRODUCING MILK
113 Commercial Dairy Farms
Central Plain Region, New York, 1953-54

Items	Per cow Amount	Per cow Value	Per 100 pounds of milk produced Amount	Per 100 pounds of milk produced Value	Per cent of total
Costs					
Concentrates					
Homegrown	1,946 lbs.	$ 53.05	23.1 lbs.	$ .63	
Purchased	1,036 lbs.	43.21	12.3 lbs.	.51	
Hay	2.4 t.	52.69	57 lbs.	.63	
Silage	5.3 t.	41.03	126 lbs.	.48	
Pasture		17.06		.20	
Total feed		$207.04		$2.45	51
Labor on cows	131 hrs.	$101.72	1.55hrs.	$1.21	25
Milk hauling		$ 17.87		$ .21	4
Depreciation on cows (net)		16.16		.19	4
Building use		15.11		.18	4
Interest on cows		10.82		.13	3
Bedding		10.21		.12	2
Equipment use		9.06		.11	2
Breeding		6.00		.07	1
Miscellaneous		15.45		.18	4
Total costs		$409.44		$4.85	100
Credits					
Calves		$ 11.38		$ .14	
Manure		10.50		.12	
Total credits		$ 21.88		$ .26	
Net cost		$387.56		$4.59	
Returns from milk					
Milk produced	8,439 lbs.	$373.46		$4.43	
Profit or loss		$-14.10		$-.16	
Returns per hour of labor			$ .67		

Source: Unpublished data by L. C. Cunningham, Dept. of Agr. Econ.
* 3.7 per cent butterfat