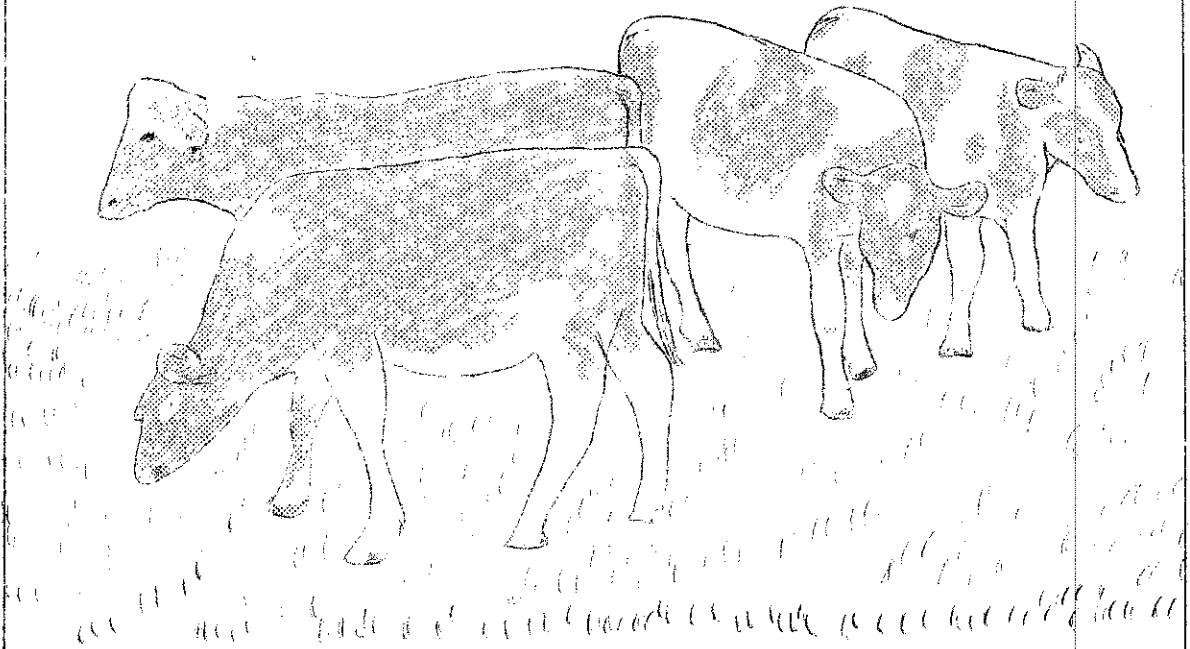


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COST OF RAISING DAIRY HEIFERS
IN NEW YORK



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The raising of heifers is an important secondary enterprise on practically every dairy farm in New York. About one-fifth of the nearly one and one-half million dairy cows are replaced each year, which means raising between 250,000 and 300,000 heifers annually. At 1941 price levels, this meant a production value of approximately 30 million dollars as compared with a 1941 gross income from milk and other dairy products of 191 million dollars. The estimated value of the annual heifer crop was equal to about one-sixteenth of the total gross farm income in the State in 1941.

Cost Studies

Studies of the cost of raising dairy heifers in New York were made in connection with cost of milk production studies on about 100 farms in each of Orange, Chenango, Cayuga, and St. Lawrence Counties in 1931.^{1/} These studies were repeated in 1940 on a similar number of farms in these same areas, and including Cattaraugus County.^{1/} The survey method was used. The records covered a 12-month period. It was assumed that the cost of keeping one heifer from birth to two years of age would be equal to the combined cost of keeping a heifer calf and a yearling for one year. In both studies the numbers of heifers in each age group were about equal.

Amounts of Feed and Labor Required to Raise Dairy Heifers to Two Years of Age

In both 1930-31 and 1939-40, slightly less than 1000 pounds of concentrates were required on the average to raise a dairy heifer to two years of age (table 1). About two tons of hay and one and three-quarters tons of silage were fed in addition to feed obtained from pasture. The average amount of milk fed per heifer was nearly 700 pounds in 1930-31 and slightly more than 800 pounds in 1939-40. These amounts included all fore milk, skim milk, and whole milk which was hand fed. The average amount of labor required per heifer was about 40 hours in both periods.

Table 1. AMOUNTS OF FEED AND LABOR REQUIRED TO RAISE
DAIRY HEIFERS TO TWO YEARS OF AGE
437 dairy farms, 1930-31 and 542 dairy farms, 1939-40 in New York

Items	Average per heifer	
	1930-31	1939-40
Concentrates, lbs.	981	945
Hay, tons	2.1	1.8
Silage, tons	1.8	1.6
Milk, lbs.	686	814
Man labor, hrs.	40	44

^{1/} Cunningham, L. C., Factors Affecting Costs and Returns in Producing Milk in New York, 1930-31, and Bierly, I. R., Costs and Returns in Producing Milk in Five Areas in New York, 1939-40. Theses, Cornell University Library.

Cost of Raising Heifers

In 1930-31, the average net cost of raising dairy heifers to two years of age amounted to \$88 per heifer (table 2). Concentrates were \$40 per ton, hay \$13 per ton, milk \$1.96 per hundredweight, and farm wages \$46 per month.

TABLE 2. COST OF RAISING DAIRY HEIFERS TO TWO YEARS OF AGE
437 dairy farms, 1930-31 and 542 dairy farms, 1939-40 in New York

Items	Average per heifer	
	1930-31	1939-40
Concentrates	\$19.83	\$14.77
Hay	26.26	21.38
Silage	8.48	6.27
Pasture	5.64	4.15
Milk	13.67	13.10
Total feed	\$73.88	\$59.67
Man labor	11.11	10.01
Interest	6.16	5.26
Building use	4.26	3.70
Bedding	2.11	1.45
Total cost	\$97.52	\$80.09
Manure credit	9.06	8.78
Net cost	\$88.46	\$71.31

In 1939-40, the average cost was \$71 per heifer. In this period concentrates were \$31 per ton, hay \$12 per ton, milk \$1.60 per hundredweight, and farm wages \$43 per month.

In 1930-31, about \$20 worth of grain, \$26 worth of hay, \$8 worth of silage, and \$14 worth of milk were fed per heifer to two years of age. These dollar values were somewhat less in 1939-40, owing to a lower level of costs. Pasture costs were about \$5 per heifer in each period.

Man labor costs amounted to about \$10 per heifer in both periods. Other costs were less important.

The average rate of milk production of the herds from which these heifers were raised was about 6500 pounds per cow in 1930-31 and 6400 pounds per cow in 1939-40.

Relative Importance of Different Costs

In both periods, feed constituted approximately 75 per cent of the cost of keeping heifers to two years of age (table 3). Man labor was about 12 per cent, interest 6 per cent, use of buildings 4 per cent, and bedding 2 per cent.

TABLE 3. RELATIVE IMPORTANCE OF DIFFERENT ITEMS
IN THE COST OF KEEPING HEIFERS TO TWO YEARS OF AGE
437 dairy farms, 1930-31 and 542 dairy farms, 1939-40 in New York

Items	Per cent of total cost	
	1930-31	1939-40
Concentrates	20.3	18.4
Hay	26.9	26.7
Silage	8.7	7.8
Pasture	5.8	5.2
Milk	14.0	16.4
Total feed	75.7	74.5
Man labor	11.4	12.5
Interest	6.3	6.6
Building use	4.4	4.6
Bedding	2.2	1.8
Total	100.0	100.0

Hay was the most important feed item and amounted to about 25 per cent of total costs. Concentrates were next in importance, followed by milk. Silage and pasture were about 8 and 5 per cent, respectively of total costs.

Cost of Raising Heifers to Age of Freshening

Insofar as the cost of keeping heifers is fairly constant regardless of age, the approximate cost of raising a heifer to freshening age can be determined. For example, the average net cost of keeping a heifer to two years of age in 1930-31 in Chenango County was \$93. Since the average age at freshening was 27.5 months, the net cost of keeping a heifer for the entire period amounted to \$107. By adding to this net cost a charge of \$15 for the average value of the heifer calf at birth, a total cost of \$122 per heifer to average age of freshening was obtained. Costs were calculated in a similar manner in the other studies.

In all, 20 studies by the survey method had been made of the cost of raising dairy heifers in New York up to 1943. The average age of heifers at freshening time in most of the areas studied was 27 or 28 months. Studies made of the cost of raising dairy heifers in the early twenties and in 1930-31, when grain and hay prices, farm wage rates, and other costs of raising heifers were about 30 per cent above the 1910-14 level, show that the average cost to age of freshening was in the neighborhood of \$100 to \$125 per heifer (table 4).

In 1918-1919, when costs were very high, the cost of raising heifers amounted to \$166 per heifer. In 1939-40, when costs were below the prewar level, the cost of raising was less than \$100 per heifer, except in Orange County where the cost amounted to \$115 a head.

TABLE 4. AVERAGE COST OF RAISING DAIRY HEIFERS TO AGE OF FRESHENING,
VALUE AT FRESHENING AND PRICE PAID FOR COWS BOUGHT
AS REPORTED BY FARM SURVEYS, 1918-1919

County	Year	Index of costs of raising heifers 1910-14 = 100	Average per heifer		Average price paid per head for cows bought
			Cost to age of freshening	Value at freshening	
Herkimer	1918-19	157	\$166	\$111	\$118
Jefferson	1921-22	136	100	48	47
Cortland (Tully)	1921-22	136	146	78	97
Chenango (Oxford)	1921-22	136	98	61	72
Chenango (Norwich)	1921-22	136	90	66	80
Chenango (Earlville)	1921-22	136	148	112	104
Madison (Munnsville)	1921-22	136	125	88	101
Madison (Munnsville)	1922-23	129	105	79	94
Chenango (Earlville)	1922-23	129	110	120	88
Chenango (Earlville)	1923-24	137	117	98	93
Chenango (Earlville)	1924-25	135	105	96	94
Chenango (Earlville)	1930-31	126	122	108	106
St. Lawrence	1930-31	126	103	80	92
Cayuga	1930-31	126	98	88	102
Orange	1930-31	126	125	117	143
Chenango (Earlville)	1939-40	93	95	87	71
St. Lawrence	1939-40	93	87	79	78
Cattaraugus	1939-40	93	73	62	68
Cayuga	1939-40	93	89	82	85
Orange	1939-40	93	115	88	103

Sources: An Economic Study of Dairying on 163 Farms in Herkimer County, New York. By E. G. Misner, Cornell University Agricultural Experiment Station Bulletin 432.

Economic Studies of Dairy Farming in New York, I, II, III, IV, V, VI, VII, VIII, XIII. By E. G. Misner, Cornell University Agricultural Experiment Station Bulletins 421, 433, 438, 441, 442, 452, 455, 462, 696.

Factors Affecting Costs and Returns in Producing Milk in New York, 1930-31, by L. C. Cunningham and Costs and Returns in Producing Milk in Five Areas in New York, 1939-40, by I. R. Bierly. Theses, Cornell University Library.

In all but one of the studies the average cost of raising heifers exceeded their average value at freshening. In 9 of the 20 studies, however, the cost exceeded the value by less than 20 per cent. Costs exceeded values materially in those years following the World War I period when cattle prices were in the trough of the cattle price cycle.

In 13 of the 20 studies the heifers at freshening age were valued lower than the price of cows purchased on the farms the same year; in four they were valued about the same, and in three they were valued higher. The cows purchased were, of course, more mature than the heifers just freshening for the first time.

Cost of Raising Heifers on Cost Account Farms

On cost-account farms, the average cost of raising dairy heifers was \$120 per heifer in 1938, \$126 in 1939 and \$134 in 1940 (table 5). In the three-year period, the average cost exceeded the average value at freshening by about 30 per cent. The level of milk production per cow on these cost-account farms was approximately 8400 pounds per cow.

TABLE 5. AVERAGE COST OF RAISING HEIFERS
TO AGE OF FRESHENING AS REPORTED BY COST-ACCOUNTS, 1938 to 1940

Year	Average per heifer	
	Cost to age of freshening	Value at freshening
1938	\$120	\$ 97
1939	126	94
1940	134	102

Sources: Costs and Returns from Farm Enterprises. By Paul S. Williamson, Cornell University Agricultural Experiment Station Bulletins 422 and 756.

Farm Cost-Accounts report for 1940. A.E. 390. By Genevieve Stone and A. J. Hansas.

Size of Heifers

As a part of the study of the cost of producing milk in 1939-40 in New York, the weights of individual cows in the herds studied were determined by use of a measuring tape. The average weights of the two-year old first calf heifers of the different breeds were as follows:

Holsteins	824 pounds
Guernseys	712 pounds
Ayrshires	761 pounds
Jerseys	686 pounds.

Considerable variation in weight of different heifers was found. Among the Holstein two-year old first calf heifers, for example, the 10 per cent of the largest heifers averaged 1098 pounds and the next heaviest 10 per cent, 994 pounds, but the lightest 10 per cent weighed only 626 pounds.

An Index of the Costs of Raising Dairy Heifers

According to the studies made in 1931 and 1940, concentrates, hay, milk, labor, interest, and building use constituted more than 80 per cent of all costs of keeping heifers. An index of costs based on these items was constructed on a 1910-14 base using the following proportions:

Concentrates	23.2
Hay	31.9
Milk	17.9
Labor	14.1
Interest	7.6
Building use	5.3
Total	100.0

During the World War I period, the index of costs rose to nearly double the 1910-14 level (table 6). In the twenties, costs were about 35 per cent above the base period and declined to somewhat below that level during the thirties. By 1942, the index of costs had risen again to the level of the twenties.

TABLE 6. INDEX OF THE COST OF RAISING DAIRY HEIFERS IN NEW YORK
1910-1942
1910-14 = 100

Year	Index	Year	Index
1910	98	1926	134
1911	98	1927	133
1912	106	1928	132
1913	97	1929	134
1914	100	1930	126
1915	101	1931	102
1916	106	1932	75
1917	130	1933	79
1918	157	1934	99
1919	178	1935	99
1920	194	1936	97
1921	136	1937	106
1922	129	1938	89
1923	137	1939	93
1924	135	1940	102
1925	134	1941	102
		1942	137

Replacement Losses and Heifers Raised

For each year from 1910 to 1942, estimates of the cost of raising a dairy heifer were prepared and compared with the price received for discarded dairy cows on the Buffalo market. The difference was considered to be the approxi-

mate replacement loss (table 7). The amount of the replacement loss each year, after adjusting for changes in the price level, was related to the changes in the number of heifers raised per 100 cows in New York.

TABLE 7. ESTIMATED COST OF RAISING A DAIRY HEIFER, PRICE OF A 1000-POUND DAIRY COW, AND THE REPLACEMENT LOSS IN NEW YORK, 1910 TO 1942.

Year	Estimated cost of raising a dairy heifer	Price of a 1000-pound discarded dairy cow	Replacement loss per head	
			Actual	Adjusted*
1910	\$ 84	\$38	\$46	\$45
1911	84	37	47	49
1912	91	40	51	50
1913	83	50	33	32
1914	86	56	30	30
1915	87	52	35	35
1916	91	53	38	30
1917	112	68	44	26
1918	135	80	55	29
1919	153	81	72	36
1920	167	78	89	39
1921	117	43	74	52
1922	111	44	67	48
1923	118	49	69	47
1924	116	45	71	59
1925	115	47	68	45
1926	115	52	63	43
1927	114	58	56	40
1928	114	74	40	28
1929	115	75	40	29
1930	108	57	51	40
1931	88	37	51	48
1932	64	29	35	37
1933	68	25	43	45
1934	85	26	59	54
1935	85	50	35	30
1936	83	50	33	28
1937	91	55	36	29
1938	77	54	23	20
1939	80	55	25	22
1940	88	58	30	26
1941	88	65	23	18
1942	118	87	31	20

* Adjusted by dividing the actual loss by the index of the General Price Level of the United States.

Disease control, labor supply, amount of pasture, the price of milk, and related factors all enter into the decisions of dairymen as to the number of heifers to raise. But variations in the replacement loss appear to explain the major changes in the number of heifers raised. Apparently, when the difference between the cost of raising a heifer and the price received for a discarded dairy cow was large, the rate of raising heifers was low, and conversely, when the margin or loss was small the rate was high (figure 1).

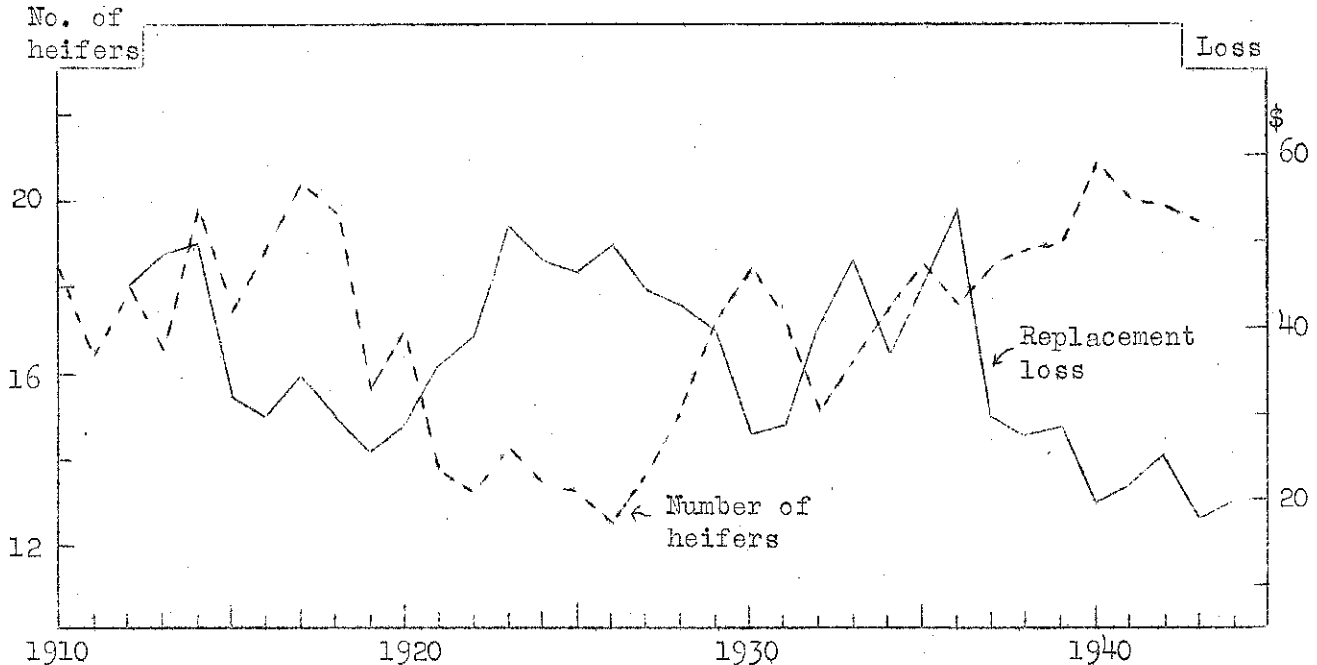


FIGURE 1. REPLACEMENT LOSS PER HEAD AND THE NUMBER OF YEARLING DAIRY HEIFERS PER 100 COWS TWO YEARS LATER IN NEW YORK, 1910-1942.

In general, when the replacement loss per head was high, the number of heifers raised was relatively low; and conversely, when the losses were low, the number raised was high.

In the period 1913 to 1917, the replacement losses amounted to about \$30 per head and the number of heifers raised per 100 cows fluctuated between 17 and 20. During most of the twenties, however, the loss was fairly high - about \$45 per head - and only about 13 or 14 heifers were raised per 100 cows. A considerable number of dairy cows were imported into New York during this period. The irregular relationship around 1934 and 1935 may be explained in part by the greatly expanded tuberculosis eradication program and the drought. From the mid-thirties to 1942, the loss was relatively low, averaging only about \$25 per head and the raising of heifers increased. From 1935 to 1942, the rate averaged 19 heifers per 100 cows.

Business Pays Better To Raise Heifers Than Not To Raise Them

Why do dairymen continue to raise heifers year after year if their cost exceeds their value? The answer is that, generally speaking, the whole dairy farm business pays better to raise heifers than not to raise them.

This situation is somewhat similar to that of raising oats. Even though oats are less profitable generally than other crops, the farm business as a unit makes more with oats than without them.

On a typical dairy farm some of the costs go on, whether or not heifers are raised. The raising of heifers supplements, to some extent, the milking of cows rather than competes with it. Also, disease control is an important factor in the home-raising of replacements.

The fact that most dairymen raise only enough heifers for their own replacements indicates the relative profitableness of heifer raising. However, some dairymen who keep good cows and who raise heifers economically find the sale of surplus dairy cattle good business.

The foregoing cost data emphasize the need of increasing the efficiency and economy in raising heifers.