



COSTS AND RETURNS IN RAISING DAIRY HEIFERS

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CONTENTS

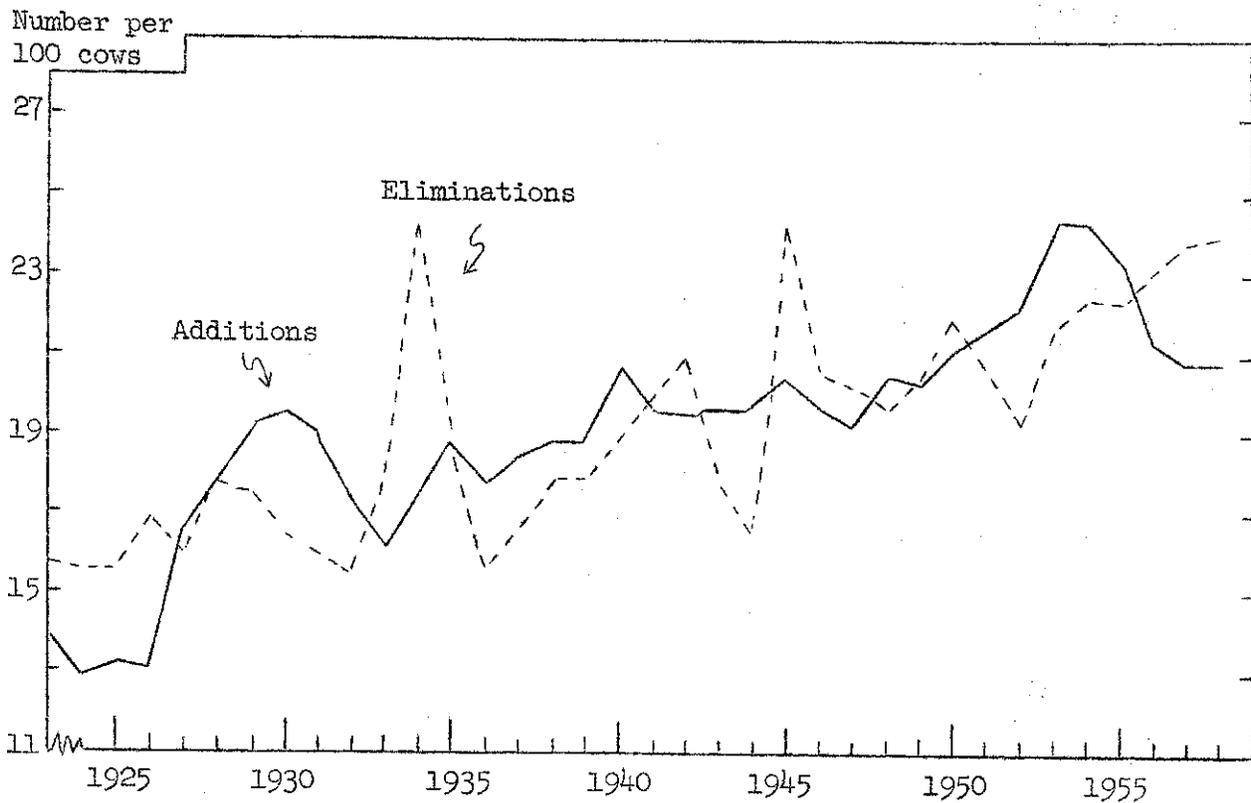
	Page
INTRODUCTION	1
Economic Conditions	2
Source of Data.	2
Number of Heifers of All Ages per Farm	3
Number of Heifers to 27 Months of Age per Farm	4
COSTS	4
Feed	5
Labor	5
Other Costs	5
Total Costs	6
Variation in Total Costs	7
RETURNS	8
Total Returns	8
Variation in Total Returns	10
Net Returns	10
Variation in Net Returns	11
Relation of Net Returns to Total Costs and Total Returns and to Labor Income.	11
NET COSTS	14
FACTORS AFFECTING COSTS AND RETURNS	14
Relation of Soils to Costs and Returns.	15
Relation of Inventory Price per Head of Cows to Costs and Returns.	17
Relation of Milk per Cow to Costs and Returns	19
Relation of Number of Heifers per Farm to Costs and Returns.	21
Relation of Hay Equivalent per Cow to Number of Heifers and Milk per Cow	22
Relation of Number of Heifers per Farm to Costs and Returns and to Labor Income, by Size of Herd	23
SUMMARY	27

COSTS AND RETURNS
IN RAISING DAIRY HEIFERS

INTRODUCTION

Dairy heifers are an important secondary enterprise on most dairy farms in New York. About one-fifth of the 1.3 million dairy cows are replaced each year. Most of these replacements are raised on the farms where they are used. Imports from outside the State are negligible. In recent years more than 300,000 heifer calves have been started annually.

One of the important features in the development of commercial dairy farming has been an increase in the rate of turnover of cows in the herds. In the nineteen-twenties, about 15 animals were added per 100 cows. This number has risen steadily and during the nineteen-fifties has been about 22 (figure 1). The more rapid turnover requires, of course, more replacements.



Source: Based on N.Y. Livestock Reports

Figure 1. ADDITIONS TO AND ELIMINATIONS FROM DAIRY HERDS, NEW YORK
1923 to 1958

How much does it cost to raise a heifer? What is the relative importance of the different items of cost? How do unit costs vary among groups of farms? How do returns compare with costs? How are important farm practices related to unit costs and returns? It is the purpose of this report to provide answers to these and similar questions about raising dairy heifers.

Economic Conditions

Economic conditions during the period covered by the study were not favorable. Prices of farm products in New York from 1954 to 1956 were fairly stable, but farm costs edged upward at a relatively high level. This was the fourth year of a period of price-cost squeeze which began in 1952.

The average price of milk received by farmers included in the study was \$3.89 per 100 pounds. The sales of dairy cows for all purposes averaged \$118 per head. Bob calves brought \$8 a head on the average. Purchased feed cost \$74 per ton, 10-10-10 fertilizer \$64 per ton. Wages with board averaged \$94 per month. The average labor income of all farms amounted to \$891.

Source of Data

Information about costs and returns in raising dairy heifers was obtained in conjunction with a study of the physical and financial operations of 556 dairy farms located in the North Country region of New York. ^{1/} The farms included in the study represent a 15 per cent random sample of all commercial dairy farms in the region. The data were collected by the survey method for the 12-month period ended April 30, 1956.

These farms were specialized in market milk production. The average size of the herds was 27 cows. Herd replacements were generally home raised, but there was some inter-farm changing of cows. Milk sales amounted to 6,554 pounds per cow. Milk production was more highly seasonal than that for the State as a whole. The farms were generally self-sufficient with respect to roughage, but most of the grains and other concentrates were purchased. Three-fourths of the cropland was in hay. About one-half of the farms produced corn for silage. Oats, the principal grain crop, was raised on two-thirds of the farms.

^{1/} The study of the operations of the farms is reported in Cornell Agr. Exp. Sta. Bul. 942.

Heifers were being raised on all except 11 of the 556 dairy farms. These 545 farms with heifers were used as the basis for this study.

Number of Heifers of All Ages per Farm

The average number of heifers of all ages on hand was 14 per farm. The distribution by age groups was as follows:

Age group	Number per farm
2 years and older	2.4
1 to 2 years	6.0
Under 1 year	5.8
Total	14.2

As would be expected from the variation in size of herd, the number of heifers varied widely on different farms. Fewer than 5 heifers of all ages per farm were found on 10 per cent of the farms, and fewer than 10 head were kept on 34 per cent of the farms. In contrast, 22 per cent of the farms had 20 heifers or more and 13 per cent of these had 25 or more.

Number of heifers of all ages on hand per farm	Number of farms	Per cent of farms
1 to 4	57	10
5 to 9	129	24
10 to 14	146	27
15 to 19	90	17
20 to 24	51	9
25 or more	72	13
Total	545	100

The number of heifer calves started during the year averaged 5.6 per farm. Freshening in the herds for the first time were 5.0 heifers per farm.

Per 10 cows on hand, there were 5.2 heifers in this region compared with 5.6 in the State as a whole. This smaller number of heifers relative to cows in the North Country is somewhat surprising in the light of the region's reputation for raising surplus cattle for sale. One possible explanation is that heifer raising may have been reduced from the peak numbers in 1953 sooner here than in other parts of the State.

Number of Heifers to 27 Months of Age per Farm

Heifers of all ages are usually found in any group of farms in any given year. Some heifer calves are started for herd replacements in every month of the year, but more are started in the spring than in the other seasons of the year in this region.

In the present study, costs and returns were enumerated for a 12-month period for all heifers, irrespective of age. The age cut-off was the time of first calving, which in this region was estimated to be 27 months of age. This procedure is in contrast to a study in which the data would be collected on the same individual heifers from birth to first calving. Such a study would undoubtedly be more accurate, but hardly feasible for large numbers of heifers kept under farm conditions.

The number of heifers to 27 months of age, as an average for all farms, was calculated as follows:

Age group	Average number per farm	Number of months	Total months
2 years and older	2.4	12	28.8
1 to 2 years	6.0	12	72.0
Under 1 year	5.8	12	69.6
Total	<u>14.2</u>		<u>170.4</u>

The 170.4 total months divided by 27 gave 6.3 heifers to 27 months of age per farm. A similar calculation was made for each farm. All of the results in this study are reported on the basis of heifers to 27 months of age. Reference hereafter to "per heifer" means per heifer to 27 months of age.

COSTS

The various costs of raising heifers are grouped under 8 major headings: feed, labor, building use, interest on investment, breeding fees, bedding and miscellaneous. The cost of the heifer calf was not included among the costs here but was treated as a debit in figuring the returns.

Feed

The common practice was to start the calves on whole milk and gradually shift over to dry feeds during about the first 8 weeks. On the average, 470 pounds of milk and 34 pounds of milk substitutes were fed per heifer (table 1). In addition, nearly 1,000 pounds of concentrates were fed. The consumption of roughage per animal averaged 2.9 tons of hay, 0.8 tons of corn silage, 0.3 tons of grass silage, and a very small amount of miscellaneous roughages. The roughage fed amounted to a hay equivalent of 3.3 tons per heifer, compared with 3.7 tons fed per milk cow on these farms. Including pasture, the feed costs amounted to \$118 per heifer. Feed made up 62 per cent of all costs.

Table 1. AMOUNT AND COST OF FEED PER HEIFER
545 dairy farms, North Country Region, New York, 1955-56

Items	Average per heifer		Value
	Amount		
Milk	470	pounds	\$ 17.24
Milk substitutes	34	pounds	1.97
Concentrates			
Homegrown	190	pounds	5.40
Purchased	753	pounds	28.30
Hay	2.9	tons	48.74
Corn silage	0.8	tons	6.31
Grass silage	0.3	tons	1.68
Other roughage			0.41
Pasture			8.05
Total feed			<u>\$118.10</u>

Labor

The labor used directly to do the chores on heifers amounted to 35 hours per heifer. The average labor rate charged was 76 cents per hour. Thus the labor cost averaged \$27 per heifer and accounted for 14 per cent of all costs.

Other Costs

On most farms, the heifers in the older age groups were housed in pentype barns. The cost of building use averaged \$14 per head and was 8 per cent of total costs.

Interest at 5 per cent on the investment in heifers amounted to \$9 per head; breeding fees of \$6 were charged, and bedding was \$4. Miscellaneous costs include veterinary service, medicines, disinfectants, supplies, insurance, registration fees, fly spray, and telephone and electricity. The share of these items charged to heifers amounted to \$12 per head, or 6 per cent of all costs.

Total Costs

The total of the foregoing items of cost amounted to about \$1,200 per farm or \$190 per heifer (table 2). The distribution of costs is shown in figure 2. The original cost of the heifer calf and the credits for the calf at birth and manure produced will be considered later.

Table 2. TOTAL COSTS OF RAISING HEIFERS
545 dairy farms, North Country Region, New York, 1955-56

Items	Average per farm	Average per heifer	Per cent of total
Feed	\$ 752	\$118	62
Labor	169	27	14
Building use	89	14	8
Interest on investment in heifers	57	9	5
Breeding fees	38	6	3
Bedding	25	4	2
Miscellaneous	77	12	6
Total	\$1,207	\$190	100

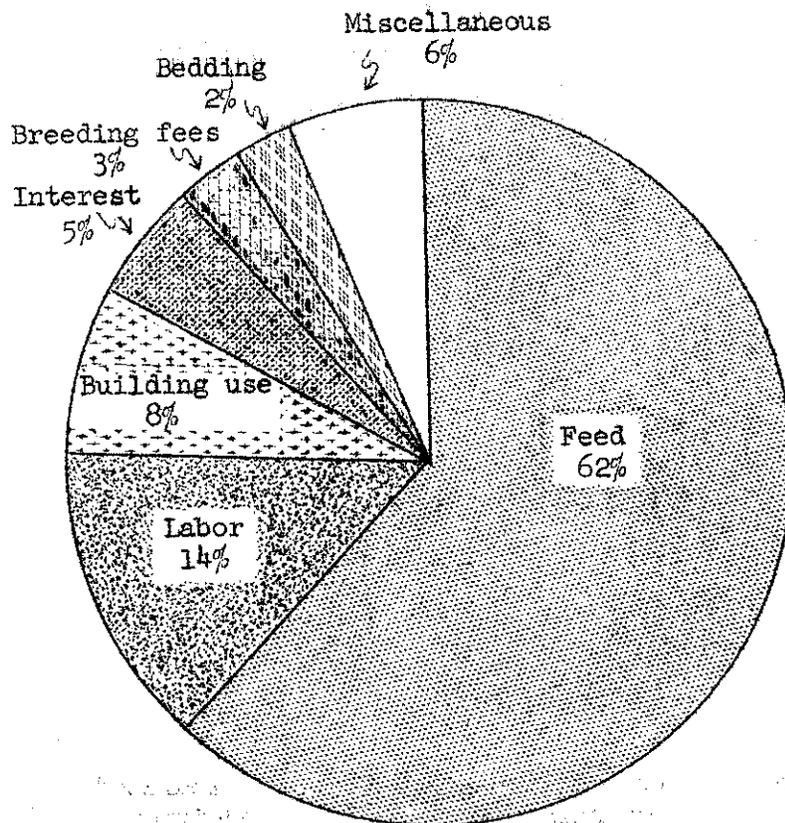


Figure 2. RELATIVE IMPORTANCE OF VARIOUS ITEMS OF COST OF RAISING HEIFERS
545 dairy farms, North Country Region, New York, 1955-56

Variation in Total Costs

One-third of the farms had costs per heifer within the range of \$150 to \$200, but costs varied widely (table 3). Unit costs were less than \$150 per head on about one-fourth of the farms. At the other extreme, unit costs exceeded \$300 per animal on nearly one-tenth of the farms.

Table 3. VARIATION IN TOTAL COSTS PER HEIFER
545 dairy farms, North Country Region, New York, 1955-56

Total costs per heifer	Number of farms	Per cent of farms
Less than \$100	10	2
\$100 to \$149	114	21
\$150 to \$199	181	33
\$200 to \$249	133	24
\$250 to \$299	64	12
\$300 or more	43	8
Total	<u>545</u>	<u>100</u>

RETURNS

The returns from raising heifers were calculated as follows: the total debits for beginning inventories and additions were subtracted from the total credits for ending inventories and removals. To this difference was added the value of the calves and manure produced. The sum is called total returns.

Total Returns

The inventory values of the 14 heifers of all ages at the beginning of the year totaled \$1,081 per farm (table 4). During the year 6 heifers per farm were added to the herds. These were mostly calves born in the herds and valued at an average price of \$9 a head. The beginning inventory values plus these additions made total debits of \$1,182 per farm.

At the close of the year, the 14 heifers on hand had a total value of \$1,188 per farm. Inventory prices ranged from \$138 per head for heifers 2 years and older and \$95 per head for those 1 to 2 years of age to \$42 per head for heifer calves under one year. Heifers of any given age group at the beginning of the year were inventoried on the same price basis as was used for the end inventory.

These prices of heifers are more subjective, perhaps, than are most of the other figures in the records in that such young stock is raised by dairymen principally for their own herd replacements. Farmers generally have more limited experience with actual market prices of heifers of different ages than they have with prices of cows bought and sold.

Table 4. TOTAL RETURNS FROM RAISING DAIRY HEIFERS
545 dairy farms, North Country Region, New York, 1955-56

Items	Number per farm	Price per head	Value per farm
Beginning inventory			
2 years and older	2.0	\$143	\$287
1 to 2 years	6.0	90	539
Under 1 year	6.1	42	255
Total	<u>14.1</u>		<u>\$1,081</u>
Additions			
Calves added from herd	5.6	\$ 9	\$ 50
Purchases, all ages	0.5	105	51
Total	<u>6.1</u>		<u>\$101</u>
Total debits	20.2		\$1,182
End inventory			
2 years and older	2.7	\$138	\$375
1 to 2 years	6.1	95	577
Under 1 year	5.6	42	236
Total	<u>14.4</u>		<u>\$1,188</u>
Removals			
Freshened into herd	5.0	\$177	\$893
Sales	0.6	123	72
Eaten	0.05	93	5
Deaths	0.13	--	--
Total	<u>5.78</u>		<u>\$970</u>
Total credits	20.2		\$2,158
Other returns			
Calves produced			\$ 43
Manure			<u>75</u>
Total returns	6.36	\$172	\$1,094

During the year, 5 heifers per farm freshened into the herds. At the time of calving, their average price was \$177 per head. This price compares with \$170 per head for cows bought and \$175 per head for the average inventory price of all cows. The value of these first-calf heifers accounted for \$893 of the total of \$970 per farm for all removals. The end inventory value plus these removals made total credits of \$2,158 per farm. Other returns included \$43 from calves produced and \$75 from manure produced.

The difference between the debits and credits plus the other returns amounted to \$1,094 per farm. The total returns of \$1,094 per farm were equal to \$172 per heifer.

Variation in Total Returns

Total returns per heifer varied widely from farm to farm. They were less than \$100 on about one-tenth of the farms (table 5). At the other extreme, they were \$250 or more on another one-tenth of the farms. Returns were between \$150 and \$200 on about one-third of the farms.

Table 5. VARIATION IN TOTAL RETURNS PER HEIFER
545 dairy farms, North Country Region, New York, 1955-56

Total returns per heifer	Number of farms	Per cent of farms
Less than \$100	54	10
\$100 to \$149	153	28
\$150 to \$199	188	35
\$200 to \$249	95	17
\$250 to \$299	36	7
\$300 or more	19	3
Total	545	100

Net Returns

The total returns per heifer were \$172. The total costs per heifer were \$190. Thus, costs exceeded returns on the average by \$18 per head (table 6).

Table 6. NET RETURNS FROM RAISING HEIFERS
545 dairy farms, North Country Region, New York, 1955-56

Items	Average per heifer
Total returns	\$172
Total costs	\$190
Net returns: per heifer	\$-18
per hour of labor	\$0.26
per ton of hay	\$11

These financial results may be expressed in terms of the returns to labor. With all other costs fully covered, dairymen realized not 76 cents per hour for all labor used directly in raising heifers as charged in the cost calculations, but 26 cents per hour. For the labor used in producing milk on these farms, the average return was 55 cents per hour.

Another way to figure the results is in terms of the price realized for hay. Hay alone was 26 per cent of total costs, compared with 14 per cent for labor. With all other costs including labor fully covered, dairymen received not \$17 per ton for the hay fed to heifers as charged in the cost calculations, but \$11 per ton.

Variation in Net Returns

Net returns per heifer covered a wide range of losses and gains. Sixty-seven per cent of the farms had losses, although losses were small in many cases (table 7). Plus net returns up to \$50 a head were found on 17 per cent of the farms, and a few farms did better than that.

Table 7. VARIATION IN NET RETURNS PER HEIFER
545 dairy farms, North Country Region, New York, 1955-56

Net returns per heifer	Number of farms	Per cent of farms
\$-150 or more	33	6
\$-149 to \$-100	69	13
\$- 99 to \$- 50	105	19
\$- 49 to \$- 1	155	29
\$ 0 to \$ 49	95	17
\$ 50 to \$ 99	64	12
\$ 100 or more	24	4
Total	545	100

Relation of Net Returns to Total Costs and
Total Returns and to Labor Income

With net returns of minus \$100 or more per heifer, averaging minus \$147, total costs amounted to \$273 and total returns only \$126 per head (table 8). As net returns improved from this very unfavorable level to \$50 or more per heifer, total costs declined and total returns increased by about equal amounts (figure 3). Apparently, profits from heifer raising on these farms were influenced about equally by differences in costs and by differences in returns.

Table 8. RELATION OF NET RETURNS TO TOTAL COSTS
AND TOTAL RETURNS PER HEIFER AND TO LABOR INCOME
545 dairy farms, North Country Region, New York, 1955-56

Range	Net returns per heifer Average	Number of farms	Average per heifer		Average labor income
			Total costs	Total returns	
\$-100 or more	\$-147	102	\$273	\$126	\$ 260
\$- 99 to \$- 50	- 69	105	217	148	690
\$- 49 to \$- 1	- 23	155	178	155	760
\$ 0 to \$ 49	+ 17	95	167	184	1,380
\$ 50 or more	+ 85	88	158	243	1,680

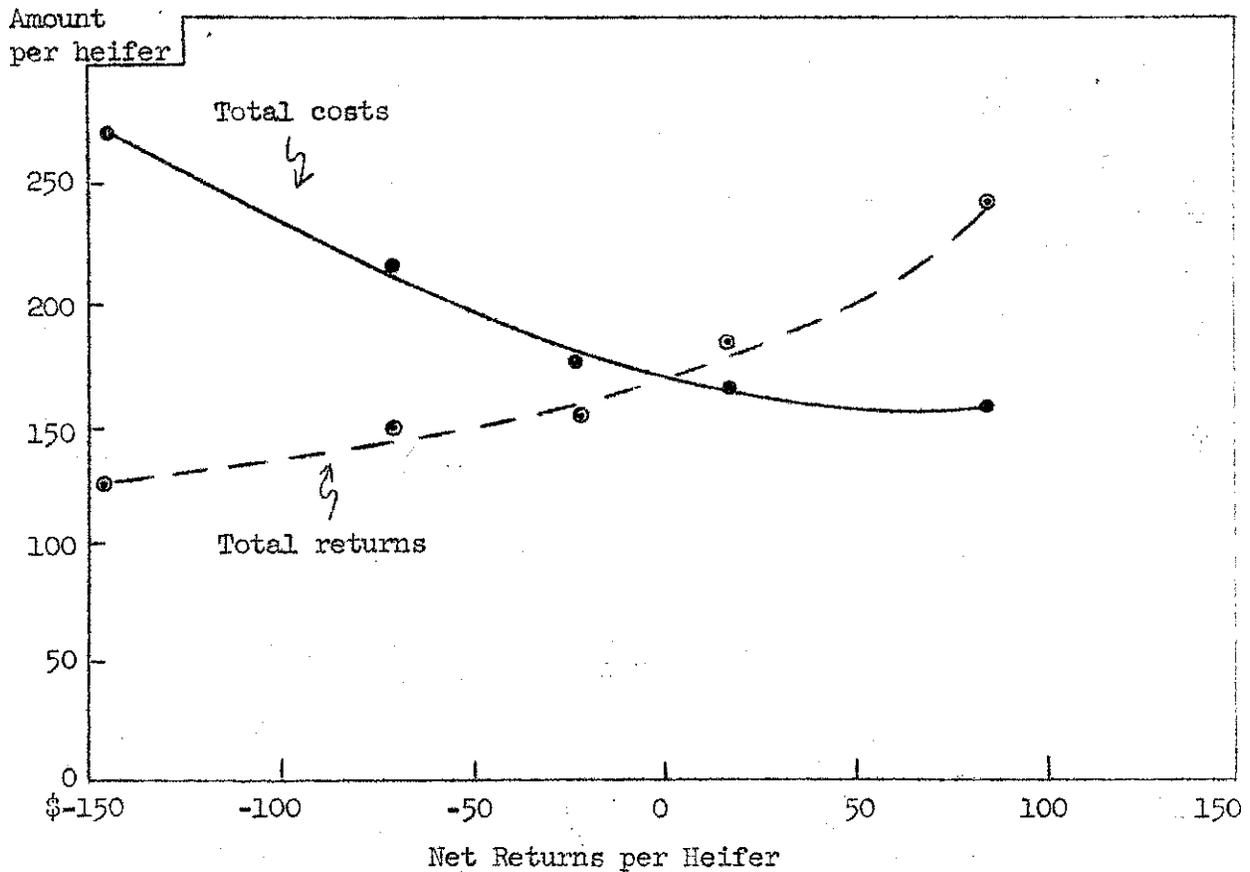


Figure 3. RELATION OF NET RETURNS TO TOTAL COSTS
AND TOTAL RETURNS PER HEIFER
545 dairy farms, North Country Region, New York, 1955-56

Even though heifers were a secondary enterprise on these farms, net returns per heifer were directly related to the labor income of the whole farm business (figure 4). On the 102 farms with the lowest net returns, labor incomes averaged only \$260. On the 88 farms with net returns of \$50 or more per heifer, incomes averaged \$1,680. Average number of cows per farm and milk sold per cow both increased somewhat as net returns per heifer rose, thus accounting for part of the increase in labor income.

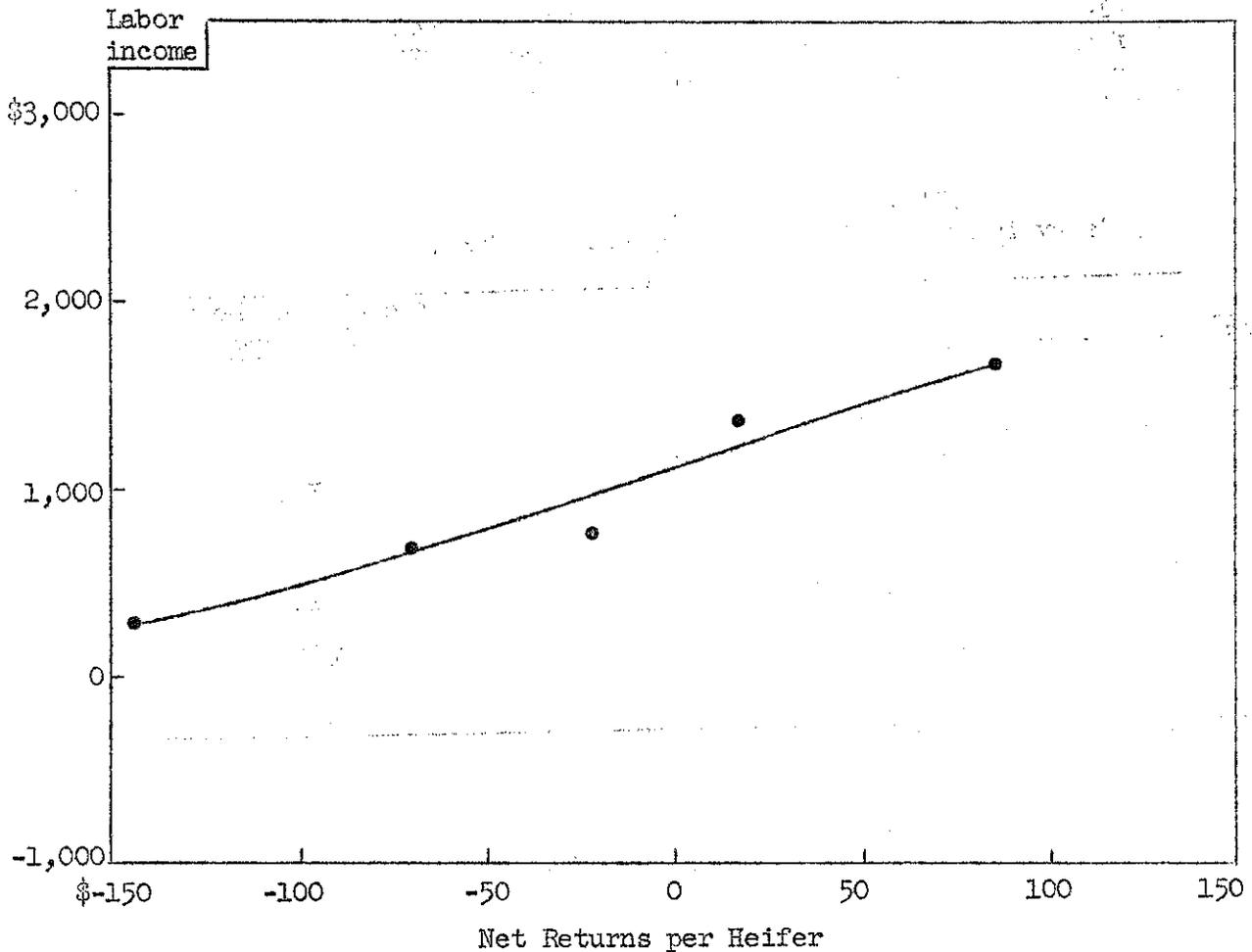


Figure 4. RELATION OF NET RETURNS PER HEIFER TO LABOR INCOME
545 dairy farms, North Country Region, New York, 1955-56

NET COSTS

The results may be summarized in terms of the net cost per heifer. The value of the heifer calves added to the herds is removed as a debit to returns and added to the costs of raising the animals. The returns for the calves and manure produced are shown as credits to obtain the net cost per heifer.

The average value of the heifer calves added to the herds was \$16 a head (table 9). The costs of raising were \$190 per heifer. The value of the calf and costs of raising combined amounted to \$206 per heifer. The credits for calves and manure produced averaged \$19 per heifer. Thus the net costs per heifer amounted to \$187.

Table 9. NET COSTS OF RAISING HEIFERS
545 dairy farms, North Country Region, New York, 1955-56

Items	Average per heifer 545 farms
Costs	
Value of heifer calf at birth	\$ 16
Costs of raising	<u>190</u>
Total	<u>\$206</u>
Credits	
Calf and manure produced	<u>\$ 19</u>
Net cost per heifer raised	\$187

FACTORS AFFECTING COSTS AND RETURNS

Among the factors that affected costs and returns per heifer were soils, inventory price per head of cows, the rate of milk production per cow and number of heifers per farm.

Relation of Soils to Costs and Returns

The four major soil areas in the region are: clays, clays with rock outcrop, loams on till, and sands. ^{2/}

Total costs per heifer showed relatively little difference among the four major soil areas, ranging from \$184 per head on the clays to \$197 on the sands (table 10 and figure 5). But total returns per heifer varied from \$191 per head on the clays, where costs were lowest, to only \$152 on the sands, where costs were highest. Consequently, net returns per heifer were significantly higher on the clays than on the sands. Net returns were in between these two extremes in the other two soil areas.

Table 10. RELATION OF SOILS TO COSTS AND RETURNS PER HEIFER
545 dairy farms, North Country Region, New York, 1955-56

Soil area	Number of farms	Average per heifer		
		Total costs	Total returns	Net returns
Clays (area 1)	93	\$184	\$191	\$+ 7
Clays with rock outcrop (area 2)	114	191	185	- 6
Loams on till (area 4)	142	192	173	-19
Sands (areas 6 and 7)	151	197	152	-45

^{2/} For a description of the soils see A. E. 1084, page 3, Physical and Financial Operation of Commercial Dairy Farms.

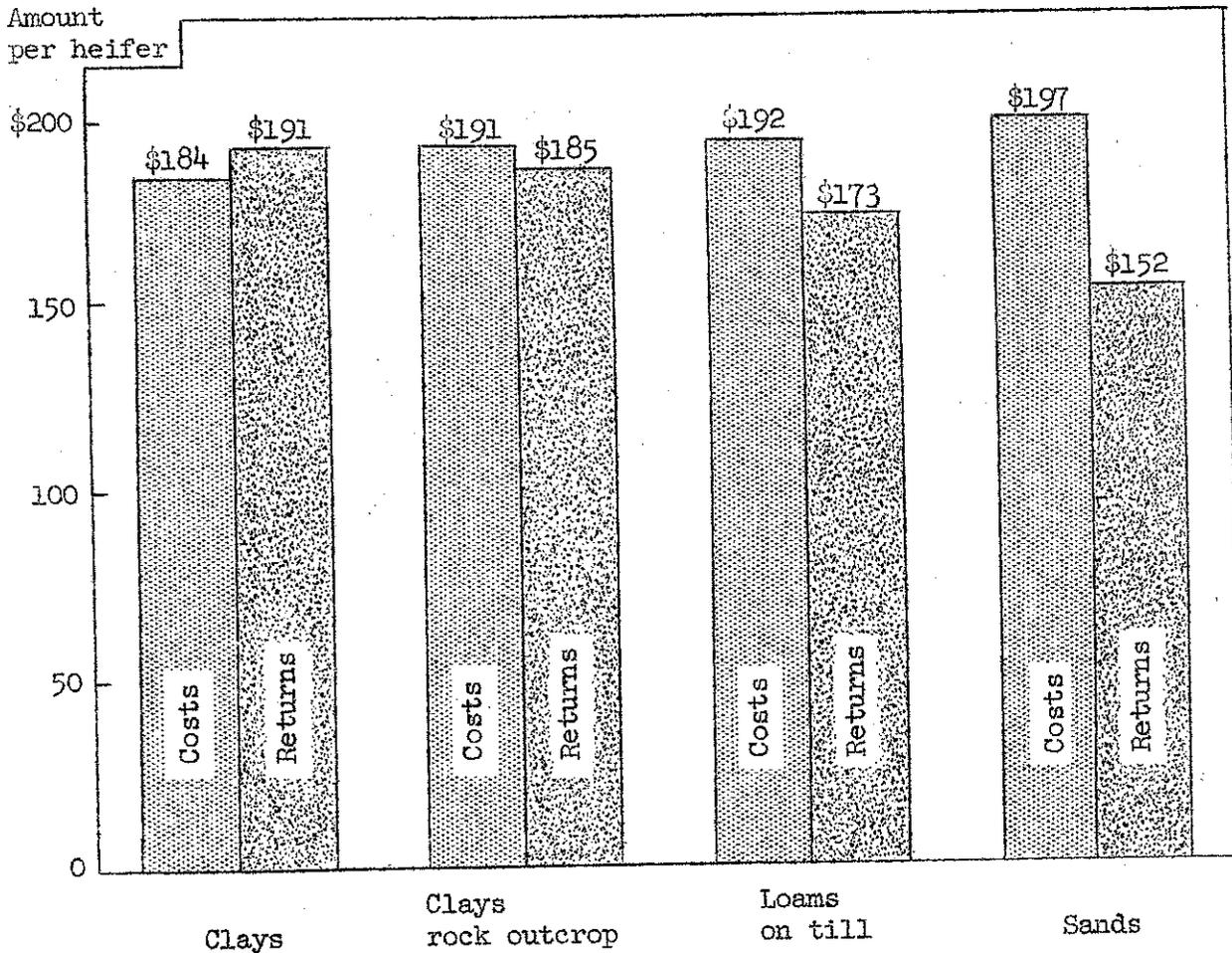


Figure 5. RELATION OF SOILS TO COSTS AND RETURNS PER HEIFER
545 dairy farms, North Country Region, New York, 1955-56

The markedly lower total returns and hence lower net returns on the sands trace to the comparatively low average price at which cows were inventoried (\$164 per head on the sands versus \$182 on the clays). This low inventory price was, in turn, associated with the second lowest rate of milk production per cow among the four soil areas (table 11).

The situation on the loams is somewhat surprising. Crop yields were highest in this soil area. Roughage supplies were larger here than in the other soil areas, yet unit total costs were the third highest among the four areas. Average milk production per cow and inventory price per head of cows were both next highest to those on the clays, yet total returns were \$18 per heifer lower.

Table 11. RELATION OF SOILS TO FARM OPERATIONS
545 dairy farms, North Country Region, New York, 1955-56

Soil areas	Number of heifers per farm	Number of heifers per 10 cows	Tons of H.E.harv. per cow	Pounds of milk sold per cow	Inv. price cows
Clays	7.3	2.6	4.8	7,040	\$182
Clays with rock outcrop	5.7	2.1	4.2	6,030	168
Loams on till	7.2	2.5	5.1	6,940	181
Sands	5.7	2.2	4.5	6,110	164

The farms on the clays made the most favorable showing. They raised the most heifers and at the lowest cost per head, had the highest rate of milk production per cow, led in inventory price per head of cows and total returns per heifer. Net returns per head showed a small gain as an average for the soil area, compared with average losses in each of the other three areas.

Relation of Inventory Price per Head of Cows to Costs and Returns

As might be expected, the prices at which cows were inventoried were closely related to returns from and only slightly related to costs of raising heifers.

With inventory prices of cows of less than \$138 a head, total returns per heifer averaged only \$125, and net returns were about minus \$50. As cow prices increased, both total returns and net returns rose, with only a comparatively small increase in costs (table 12 and figure 6). With inventory prices of \$213 or more per cow, total returns per head were about \$240 and net returns \$31.

In this connection, two questions are raised by this matter of inventory prices of cows. One question is 'did the high-priced cows produce more milk'? And the other is 'did high-priced cows result in a greater market loss or depreciation on cows sold'? The answer to both questions is 'yes'. These relationships were as follows:

Inventory price per head of cows	Pounds of milk sold per cow	Depreciation on cows per cow
Less than \$138	5,490	\$ 7
\$138 to \$162	6,040	10
\$163 to \$182	6,500	14
\$183 to \$212	6,840	14
\$213 or more	8,160	24

Table 12. RELATION OF INVENTORY PRICE PER HEAD OF COWS
TO COSTS AND RETURNS PER HEIFER
545 dairy farms, North Country Region, New York, 1955-56

Inventory price per head of cows		Number of farms	Average per heifer		
Range	Average		Total costs	Total returns	Net returns
Less than \$138	\$113	67	\$178	\$125	\$-53
\$138 to \$162	150	195	181	141	-40
\$163 to \$188	175	107	190	166	-24
\$189 to \$212	199	110	197	192	- 5
\$213 or more	252	66	210	241	+31

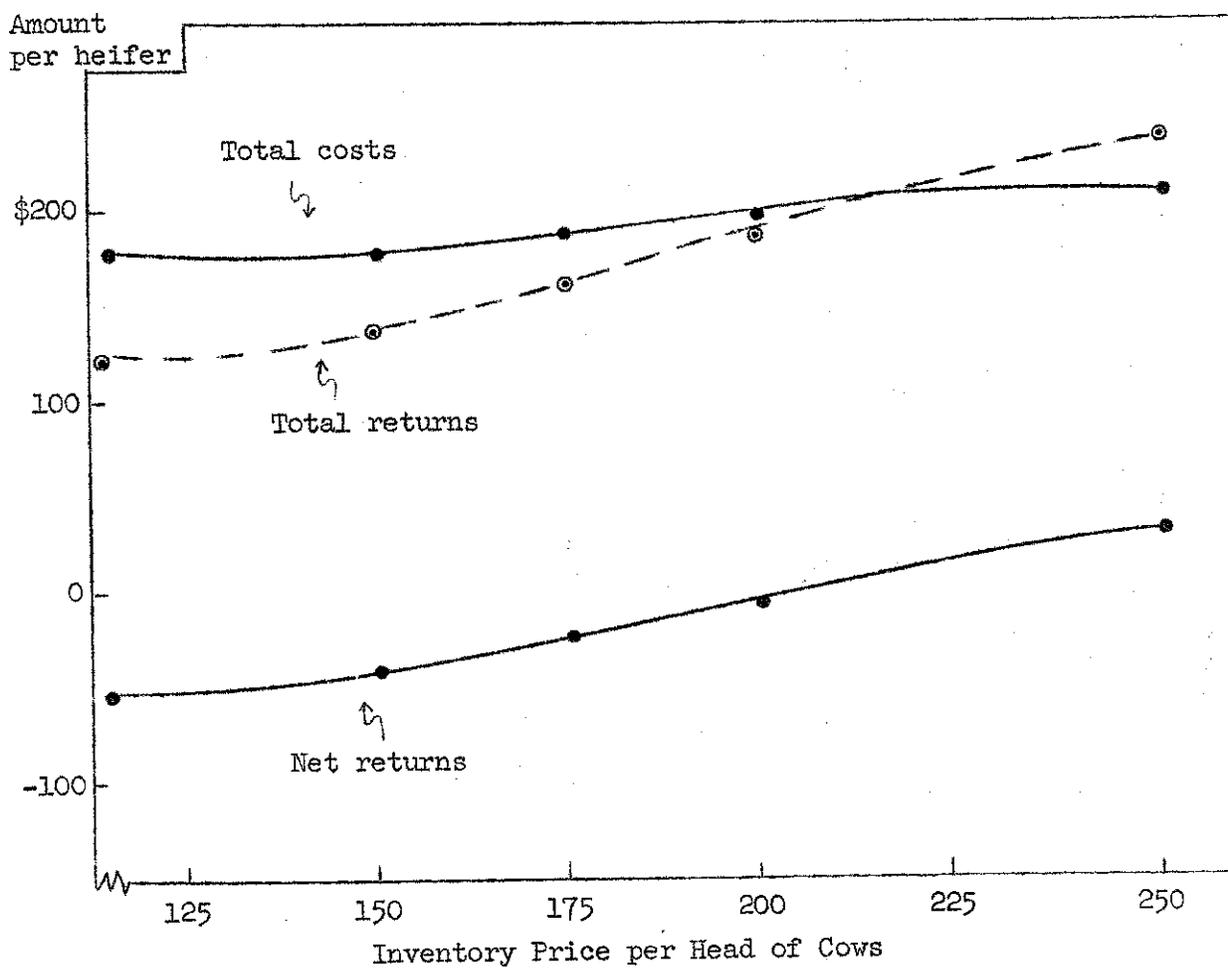


Figure 6. RELATION OF INVENTORY PRICE PER HEAD OF COWS
TO COSTS AND RETURNS PER HEIFER
545 dairy farms, North Country Region, New York, 1955-56

The larger milk sales per cow appear to justify the higher levels of inventory prices of cows. With relatively low inventory prices, the depreciation on cows per farm was kept low but the net returns on heifers per farm were very unfavorable. With relatively high inventory prices, the loss on cows was large but net returns from heifers were much improved. So one obvious effect of this factor of inventory price of cows is to throw the gain or loss into the cow account or the heifer account. If a low price is used, the cow account is favored. If a high price is used, the heifer account gains. The farm business as a whole remains unchanged except for differences in interest charges on the investment.

Inventory price per head of cows	Depreciation on cows per farm	Net returns from heifers per farm
Less than \$138	\$164	\$-243
\$138 to \$162	266	-230
\$163 to \$182	390	-164
\$183 to \$212	418	-35
\$213 or more	703	+254

The more fundamental factor involved here is the rate of milk production per cow - the subject up next for analysis.

Relation of Milk per Cow to Costs and Returns

In general, it cost a little more to raise a heifer in high-producing herds than in low and average-producing herds. In the ranges of milk production up to 8,000 pounds per cow, total costs were around \$190 per heifer. With higher production per cow, costs exceeded \$200 (table 13). This relationship held true despite the fact that more heifers were raised both per farm and per 10 cows in the high-producing herds. It will be shown later that the larger the number of heifers, the lower the costs per heifer. But the heifers raised in the more productive herds received considerably more feed, and presumably were grown out better.

Table 13. RELATION OF MILK PER COW TO COSTS AND RETURNS PER HEIFER
545 dairy farms, North Country Region, New York, 1955-56

Pounds of milk sold per cow		Number of farms	Average per heifer		
Range	Average		Total costs	Total returns	Net returns
Less than 5,000	4,140	87	\$170	\$154	\$-16
5,000 to 5,999	5,430	118	193	167	-26
6,000 to 6,999	6,460	149	187	163	-24
7,000 to 7,999	7,410	95	188	169	-19
8,000 to 8,999	8,350	57	206	186	-20
9,000 or more	9,950	39	210	216	+6

Total returns per heifer rose fairly consistently as milk per cow increased (figure 7). Returns averaged only \$154 per heifer in the herds with less than 5,000 pounds of milk sold per cow, as compared with \$216 per heifer with the herds with 9,000 pounds or more. The fact that returns per heifer closely paralleled the inventory price per head of cows at the various production levels suggests that perhaps conservative values were placed on the heifers raised. In any event, since costs rose along with returns as production per cow increased, net returns per heifer, except at the highest production level, were about unchanged at around minus \$20 per head. In the herds with 9,000 pounds or more of milk per cow, the net returns averaged \$6 per heifer. Of course, the dairymen who raised heifers good enough to maintain production in the better herds, even at the same level of net returns per heifer, made higher incomes from the whole farm business than did the dairymen who raised heifers for replacements in low-producing herds.

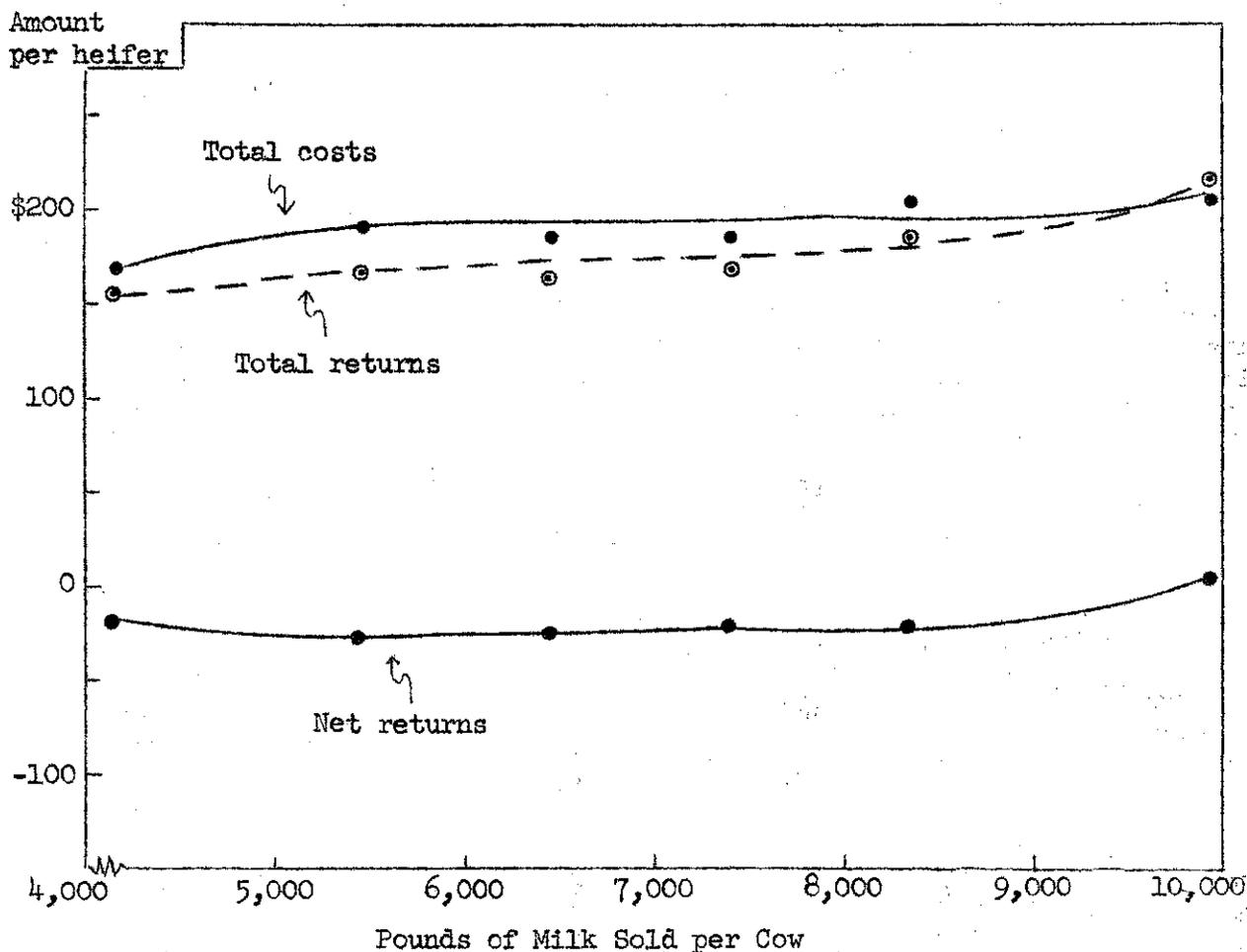


Figure 7. RELATION OF MILK PER COW TO COSTS AND RETURNS PER HEIFER
545 dairy farms, North Country Region, New York, 1955-56

Relation of Number of Heifers per Farm to Costs and Returns

The size of the heifer enterprise had a direct bearing on costs, although little or no relation to returns. As the number of heifers increased from less than 2.0 to 10.0 or more per farm, total costs per heifer declined from \$250 to \$179 (table 14 and figure 8). Much of the reduction in costs was due to the saving in labor. Since total returns per heifer were about unchanged with increasing size of the enterprise, the net returns were much less unfavorable on the farms with many heifers than on the farms with few heifers.

Table 14. RELATION OF NUMBER OF HEIFERS PER FARM
TO COSTS AND RETURNS PER HEIFER
545 dairy farms, North Country Region, New York, 1955-56

Number of heifers per farm		Number of farms	Average per heifer		
Range	Average		Total costs	Total returns	Net returns
Less than 2.0	1.4	57	\$250	\$167	\$-83
2.0 to 3.9	3.0	104	241	176	-65
4.0 to 5.9	4.9	148	200	164	-36
6.0 to 7.9	6.9	85	186	183	- 3
8.0 to 9.9	8.8	61	173	156	-17
10.0 or more	13.7	90	179	177	- 2

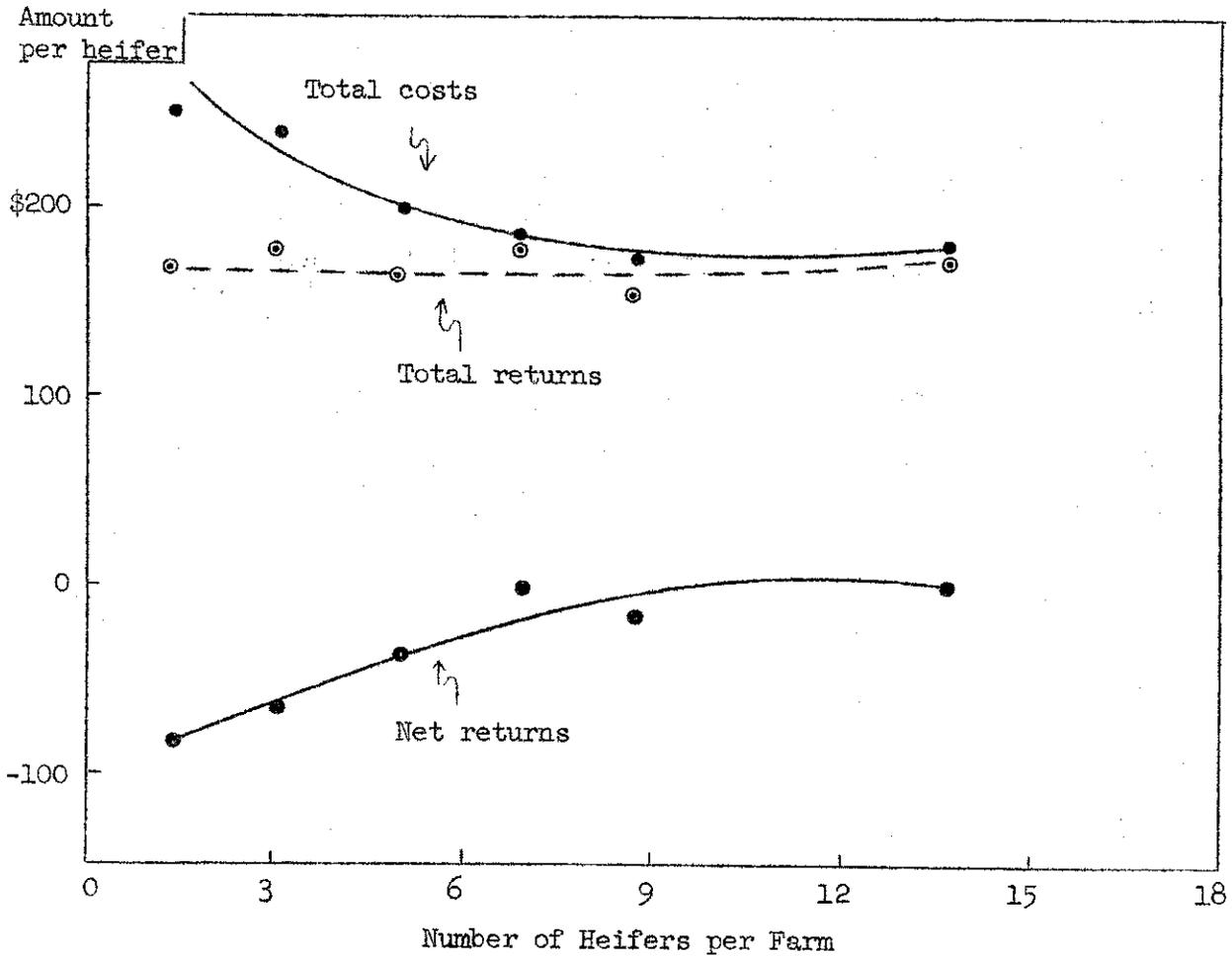


Figure 8. RELATION OF NUMBER OF HEIFERS PER FARM TO COSTS AND RETURNS PER HEIFER
545 dairy farms, North Country Region, New York, 1955-56

Relation of Hay Equivalent per Cow to Number of Heifers and Milk per Cow

The amount of roughage available had a strong influence on the number of heifers raised as well as on the rate of milk production per cow. The larger the roughage supply, the greater the number of heifers raised and the higher the milk volume per cow (table 15).

Table 15. RELATION OF HAY EQUIVALENT HARVESTED PER COW
TO NUMBER OF HEIFERS PER 10 COWS AND AMOUNT OF MILK PER COW
545 dairy farms, North Country Region, New York, 1955-56

Tons of hay equivalent harvested per cow		Number of farms	Number of heifers per 10 cows	Pounds of milk sold per cow
Range	Average			
Less than 3.0	2.4	51	1.6	5,520
3.0 to 3.9	3.4	119	2.0	6,080
4.0 to 4.9	4.4	174	2.3	6,520
5.0 to 5.9	5.3	108	2.6	6,630
6.0 or more	8.3	93	3.0	7,260

Relation of Number of Heifers per Farm to Costs
and Returns and to Labor Income, by Size of Herd

With small herds, averaging around 15 cows per farm, increasing the number of heifers per farm tended to reduce the loss on heifers, but bore no consistent relation to labor income (table 16 and figure 9).

With medium-sized herds, averaging around 25 cows per farm, raising more heifers improved the net returns per heifer, by lowering unit costs and, together with higher milk production per cow, increased the average labor income of the whole farm business.

With large herds, also, raising more heifers tended to improve the net returns per heifer because costs per heifer were reduced. More heifers in these large herds were accompanied by higher milk production per cow. Furthermore, herd size was not held constant (table 17). As a consequence, average labor incomes rose significantly.

It appears that, even though raising heifers did not pay as well as producing milk on these farms, the farm business was more profitable if at least the usual herd replacements were raised than if relatively few heifers were raised.

Table 16. RELATION OF NUMBER OF HEIFERS PER FARM
TO COSTS AND RETURNS PER HEIFER AND TO
LABOR INCOME, BY SIZE OF HERD
545 dairy farms, North Country Region, New York, 1955-56

Number of heifers per farm		Number of farms	Average per heifer			Labor income
Range	Average		Total costs	Total returns	Net returns	
<u>Small herds</u>						
Less than 2.0	1.4	36	\$248	\$163	\$-85	\$ 330
2.0 to 3.9	2.9	35	254	164	-90	490
4.0 to 5.9	4.8	38	180	161	-19	-30
6.0 or more	8.3	25	181	160	-21	210
<u>Medium-sized herds</u>						
Less than 3.0	2.1	37	\$237	\$171	\$-66	\$ 70
3.0 to 5.9	4.5	107	207	171	-36	680
6.0 to 8.9	7.3	49	170	177	+ 7	1,090
9.0 or more	11.2	21	158	161	+ 3	1,360
<u>Large herds</u>						
Less than 5.0	3.3	40	\$230	\$174	\$-56	\$ 910
5.0 to 8.9	7.0	74	191	176	-15	1,140
9.0 to 12.9	10.9	48	197	171	-26	1,800
13.0 or more	17.0	35	174	181	+ 7	2,790

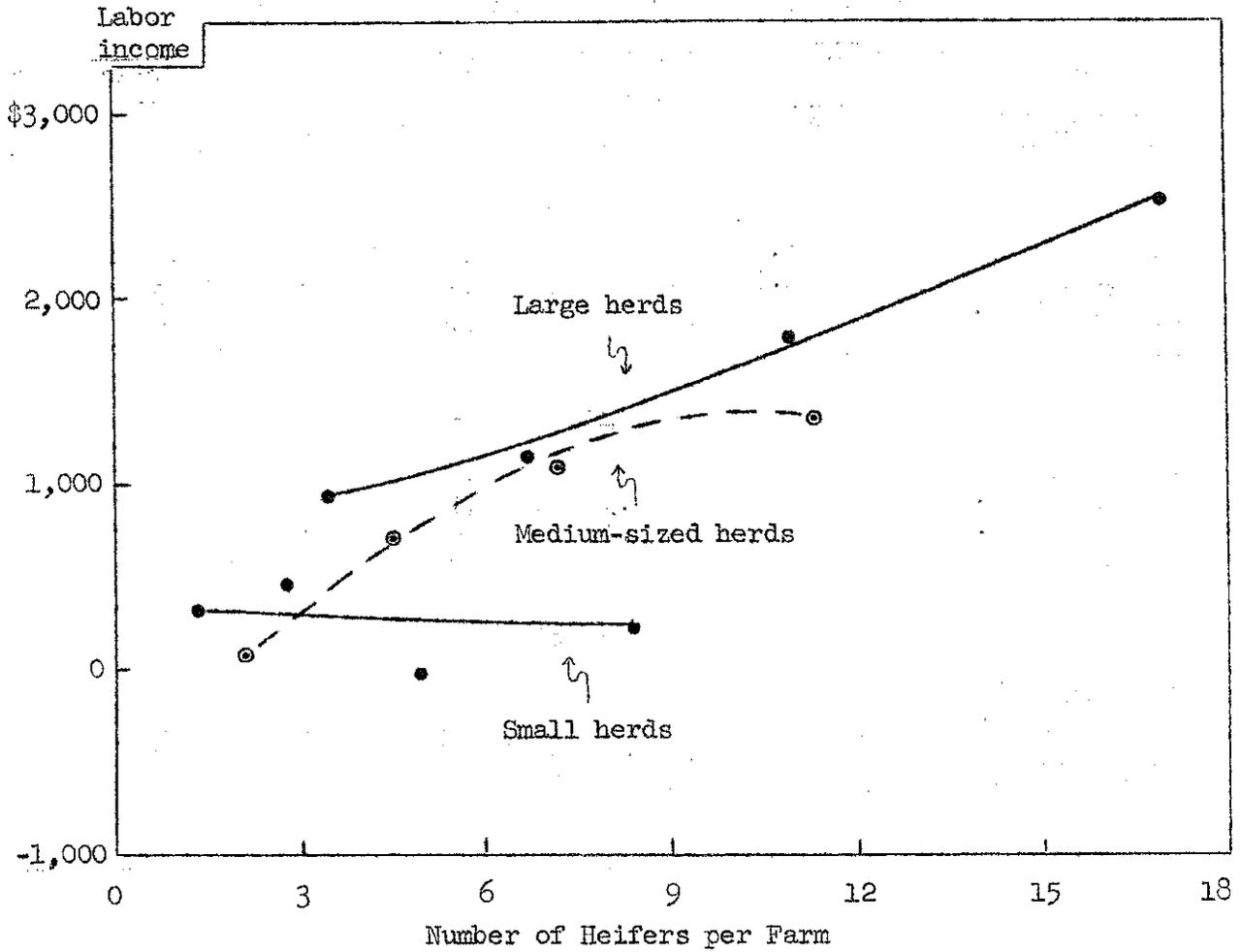


Figure 9. RELATION OF NUMBER OF HEIFERS PER FARM TO LABOR INCOME, BY SIZE OF HERD
545 dairy farms, North Country Region, New York, 1955-56

Table 17. RELATION OF NUMBER OF HEIFERS PER FARM
TO FARM OPERATIONS, BY SIZE OF HERD
545 dairy farms, North Country Region, New York, 1955-56

Number of heifers per farm		Number of heifers per 10 cows	Pounds of milk sold per cow	Cows per farm	Inv. price per head of cows	Per cent of cows replaced
Range	Average					
<u>Small herds</u>						
Less than 2.0	1.4	1.1	6,250	13	\$152	18
2.0 to 3.9	2.9	2.0	6,250	14	159	17
4.0 to 5.9	4.8	3.0	5,960	16	161	17
6.0 or more	8.3	5.0	6,680	16	188	30
<u>Medium-sized herds</u>						
Less than 3.0	2.1	0.9	5,870	24	\$169	15
3.0 to 5.9	4.5	1.9	6,180	24	169	18
6.0 to 8.9	7.3	3.0	6,530	24	177	24
9.0 or more	11.2	4.6	6,830	34	180	23
<u>Large herds</u>						
Less than 5.0	3.3	1.0	6,160	34	\$170	20
5.0 to 8.9	7.0	1.9	6,560	37	173	18
9.0 to 12.9	10.9	2.8	7,450	40	191	22
13.0 or more	17.0	3.6	7,480	48	197	25

SUMMARY

Heifers were raised on 545 out of 556 commercial dairy farms in the North Country region of New York. The 556 farms represent a 15 per cent random sample of all commercial dairy farms in the region. The 14 heifers of all ages per farm were sufficient for the needed replacements in the herds which averaged 27 cows per farm. Costs and returns were reported on the basis of a heifer to 27 months of age - that is, the total heifer months for each farm divided by 27. On this basis, the average number of heifers so defined and used in this report was 6.3 per farm.

Total costs averaged \$190 per heifer, of which 62 per cent was feed and 14 per cent was labor. Unit costs were much higher on some farms than others, but one-third of the farms had costs within the range of \$150 to \$200 per heifer.

Total returns amounted to \$172 per heifer. At the time of first calving heifers were valued, on the average, at \$177 per head, compared with \$170 per head for cows bought and with \$175 per head for the average inventory price of all cows. Returns varied widely from farm to farm.

Costs of raising heifers exceeded returns by \$18 per head, on the average. Sixty-seven per cent of the farms had losses, although losses were small in many cases. Net returns up to \$50 a head were found on 17 per cent of the farms, and a few farms did better than that. The greater the net returns per heifer, the higher the labor income of the whole farm business.

The labor used in raising heifers, 35 hours per heifer, earned an average return of 26 cents per hour. The labor return from producing milk on these farms averaged 55 cents per hour. With all other costs including labor fully covered, dairymen realized \$11 per ton for the hay fed to heifers.

The value of the heifer calf and the rearing costs amounted to \$206 per heifer. Credits for calves and manure produced gave a net cost per heifer raised of \$187.

Total costs per heifer were not greatly different in the four major soil areas of the region, but returns were markedly lower on the sands. In this area, however, inventory prices of cows and milk production per cow were relatively low. Net returns from raising heifers were the most favorable on the clays where milk production per cow was the highest.

The higher the inventory price per head of cows, the larger the total and net returns per heifer, but the larger the loss per cow on cows sold.

Both total costs and total returns per heifer went up as milk production per cow increased. Consequently, net returns per heifer, except at the highest production level, were about unchanged as milk per cow rose. However, the dairymen who raised heifers good enough to maintain production in the better herds, even at the same level of net returns per heifer, made higher labor incomes than did the dairymen who raised heifers for replacements in low producing herds.

The larger the number of heifers per farm, the more favorable the net returns per heifer. Although total returns per heifer were unrelated to the size of the enterprise, total costs per heifer decreased as the number of heifers per farm increased. The larger the roughage supply harvested per cow, the larger the number of heifers raised relative to the number of cows in the herd.

With medium-sized and large herds of cows, the larger the number of heifers raised, the larger the labor income. Part of the increase in income was contributed by higher milk production per cow. Even though raising heifers did not pay as well as producing milk on these farms, the farm business as a whole benefited profitwise if at least the normal requirements for herd replacements were raised.

SUMMARY OF FARM BUSINESS AND HEIFER ENTERPRISE FACTORS
545 dairy farms, North Country Region, New York, 1955-56

Items	Averages
Number of cows per farm	27
Number of heifers by ages per farm	
Under 1 year	5.8
1 to 2 years	6.0
2 years or more	2.4
Number of heifers to 27 months of age per farm	6.3
Per cent of cows replaced	20
Pounds of milk sold per cow	6,554
Inventory price per head of cows	\$175
	per heifer*
Hours of labor	35
Pounds of milk fed	470
Pounds of concentrates fed	943
Tons of hay fed	2.9
Tons of corn silage fed	0.8
Tons of grass silage fed	0.3
Total costs	\$190
Total returns	\$172
Net returns	\$-18
Net costs	\$187

* To 27 months of age