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ECONOMIC CONSIDERATIONS in RAISING DAIRY REPLACEMENTS

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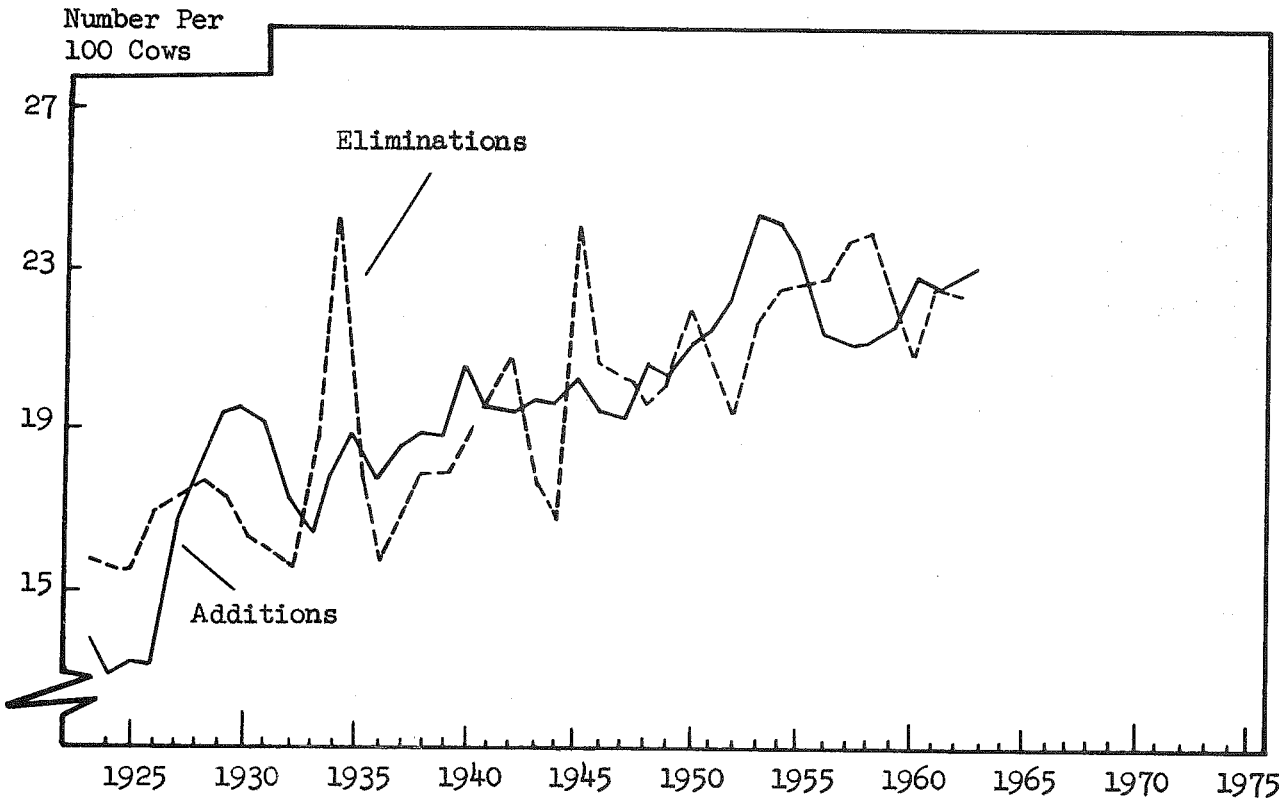
COSTS AND RETURNS IN GROWING DAIRY HEIFERS

The number of dairy herds in New York State is declining, but the size of herd is increasing. As this and specialization comes in milk production, the rate of turnover of cows in these herds is faster and more replacements are needed. About 23 per cent of the dairy cow population were replaced in 1963 compared to about 15 per cent in 1925 (Figure 1).

Figure 1. ADDITIONS TO AND ELIMINATIONS FROM DAIRY HERDS
New York, 1932 to Date



SOURCE: New York State Livestock Reports, New York Crop Reporting Service, Department of Agriculture and Markets, Bureau of Statistics.

The problem of having source of dairy replacements confronts every commercial dairyman and there are three general alternatives:

1. Home-raised replacements.
2. Purchased replacements from within or outside the State.
3. Own animals grown on contract by a heifer-raising specialist.

Traditionally, dairymen have been hesitant to depend exclusively on purchased replacements because of danger to herd health and production potential. To avoid such risks most dairymen have raised their own replacements. Still others have done so in the hopes of savings in cost.

A New Hampshire study indicated that the fears of lower production and increased disease associated with purchased replacements are generally unfounded. No important difference was found to exist between purchased and home-grown replacements for factors such as level of production, length of productive herd life and disease incidence.1/ With this information and the need - with greater specialization in milk production - for heifers not raised on the farm the study of the alternative sources of dairy heifers was undertaken.

THE STUDY

Economic conditions during the 1961-62 study period were not favorable for farmers. Prices of farm products in New York State tended to weaken from a 1959 peak, and farm costs moved toward a higher level. For example, the price of dairy ration in 1962 was about $3.00 per ton higher than the average for the preceeding five years, while the blended farm price of milk was $0.22 lower. Except as farmers adjusted to such changes their net incomes were lower. Furthermore, the dry weather in New York State during 1962 reduced the amount of forage available and increased the price of all feed which caused a substantial volume of marketings of cattle and lowered the price of slaughter and dairy cows and dairy replacements.

As a part of this study information was obtained from farmers who were raising heifers as a primary cash enterprise. Twenty such farmers gave information concerning physical and financial inputs for raising dairy replacements.

The Farms

The twenty farms were located in four of the five major agricultural regions of New York State. These regions differ in factors such as topography, soil fertility, drainage, type of farming and degree of urban penetration.

Region	Number of Farms
Hudson Valley	1
Central Plain	7
Oneida-Mohawk Valley	3
Plateau Country	9
Total	20

1/ Frick, G. E. and W. F. Henry. Production Efficiency on New England Dairy Farms, V. Adjustments in Obtaining Dairy Herd Replacements. University of New Hampshire Agricultural Experiment Station Bulletin 430. August, 1956.

Two distinct types of heifer growers were found. These were (1) large essentially full-time operations and (2) small obviously part-time businesses. There were eight operations with more than 40 mature heifer equivalents which were classified as commercial farms and 12 operations with less than 40 mature heifer equivalents which were classified as part-time enterprises. 2/ A separate analysis was made for each group.

A majority of the part-time farms were located in the Plateau Country, while most of the commercial growers were located in the Central Plain and Oneida-Mohawk Valley (Figure 2).

Type of Livestock Previously Owned

Two-thirds of the part-time and less than one-half of the commercial growers had experience with dairy cattle before entering the heifer business. Two other commercial growers had experience with beef, one with poultry, and two had no previous livestock experience. Three part-time growers had experience with poultry, and one had no livestock experience (Table 1).

Table 1. LIVESTOCK PREVIOUSLY OWNED BY HEIFER GROWERS
20 Farms, New York State, 1962

Kind of Livestock	Number of Growers	
	Commercial	Part-time
Dairy cows	3	8
Beef	2	0
Poultry	1	3
None	2	1
Total	8	12

Reasons for Raising Heifers

Commercial growers raised heifers as a major business enterprise while part-time growers often received considerable income from urban employment or social security benefits. Half of the commercial growers looked upon the enterprise as a way to sell crops (Table 2). The others considered the enterprise as a way to utilize labor as well as crops. Three-fourths of the part-time growers kept heifers because they liked animals. Only one-fourth looked at the enterprise primarily from a business point of view.

2/ A mature heifer equivalent was defined as follows: Add the months each individual heifer was in the operation to obtain total heifer-months. Since the average age of freshening heifers is 27.5 months, the total heifer-months divided by 27.5 yields the number of mature heifer equivalents produced in one year.

Figure 2. GEOGRAPHIC LOCATION OF PART-TIME AND COMMERCIAL HEIFER GROWERS New York State, 1962

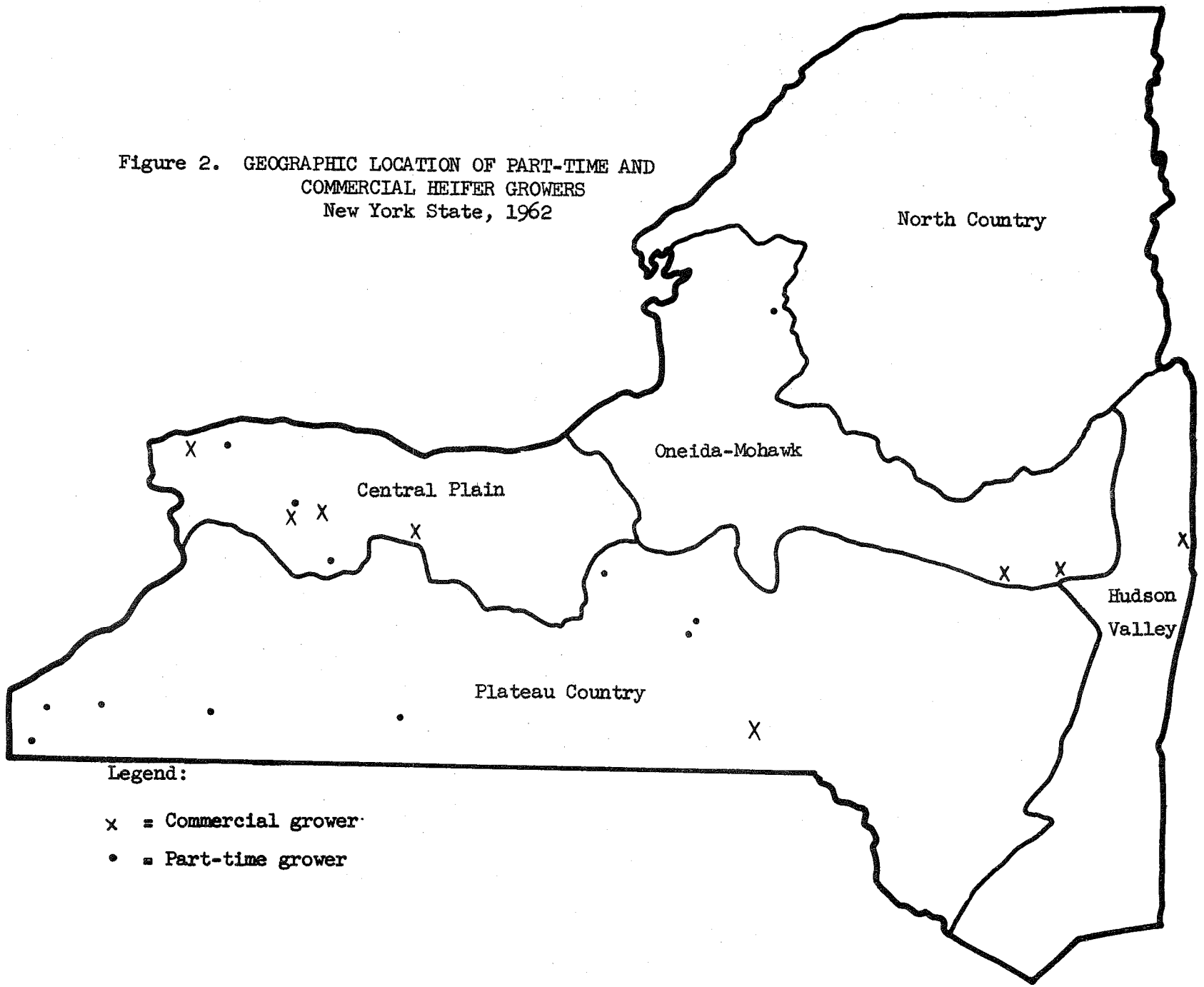


Table 2. REASONS FOR RAISING DAIRY HEIFERS
20 Farms, New York State, 1962

Reason	Number of Growers	
	Commercial	Part-time
Way to sell crops	4	3
Improve labor distribution	1	0
Combination of selling crop and labor distribution	3	0
Like animals	0	9
Total	8	12

Years in Heifer Business

Six of the commercial growers had been in business for five or more consecutive years, while less than one-half of the part-time growers had been established for thatperiod of time (Table 3). Two commercial growers had been in the heifer business for nearly 20 years.

Table 3. YEARS IN HEIFER GROWING BUSINESS
20 Farms, New York State, 1962

Years	Number of Growers	
	Commercial	Part-time
1	0	1
2	0	2
3	1	2
4	1	2
5 or more	6	5
Total	8	12

PRACTICES

Source of Calves

The commercial growers obtained calves from cattle brokers, local farmers and farm auctions while a majority of the part-time growers obtained calves

exclusively from local farmers. Some of the latter utilized only farm auctions as their source. None of the part-time growers obtained calves from a broker or dealer, perhaps because they needed a relatively few animals (Table 4).

Table 4. SOURCE OF CALVES
20 Farms, New York State, 1962

Source	Number of Growers	
	Commercial	Part-time
Farm auction	0	2
Cattle broker	2	0
Local farmers	2	7
Both auction and local farmers	4	3
Total	8	12

Criteria for Selection of Calves

Some growers placed great emphasis on the genetic background of the animal, while others considered only the size and conformation of the calf. A few growers relied upon the recommendation of the seller. Some growers considered a combination of factors (Table 5).

Table 5. CRITERIA FOR SELECTION OF CALVES
20 Farms, New York State, 1962

Criteria	Number of Growers	
	Commercial	Part-time
DHIA record on dam	3	2
Artificially sired	1	2
Size of calf	1	1
Seller's recommendation	2	2
Combination of above factors	1	5
Total	8	12

Housing

All of the commercial growers employed some type of loose housing system but only two of the part-time growers used this arrangement. The remaining part-time growers often utilized individual pens for calves under six months of age and converted stanchions for older heifers. This difference in housing systems would be expected to result in different bedding and labor requirements.

Feeding

Four of the commercial farms employed a mechanical silage feeding system featuring a silo unloader and auger conveyor. One of the part-time farms used a silo unloader, but none reported the use of an auger conveyor.

Manure Removal

All of the commercial growers and the two part-time growers using a loose housing system removed manure mechanically with a tractor and manure scoop. Two part-time growers removed manure with a chain type barn cleaner, while the others used the shovel and fork method.

Method of Marketing Heifers

The method of selling heifers may have considerable effect on the price an animal will bring. Most part-time growers sold heifers to local farmers or through local auctions. The commercial growers with large numbers of heifers to be sold each year often depended on cattle brokers or dealers to market their animals. Other commercial growers sold heifers to local farmers and through auctions (Table 6).

Table 6. METHOD OF MARKETING HEIFERS
20 Farms, New York State, 1962

Method	Number of Growers	
	Commercial	Part-time
Auction	0	1
Broker or dealer	3	1
Local farmers	1	6
Both auctions and local farmers	4	4
Total	8	12

Seasonal Patterns in Marketing

The commercial growers sold most of their heifers in July, August and October; part-time growers sold mostly in July and August (Figure 3 and Figure 4). Since most of the heifers were sold shortly before freshening, both part-time and commercial growers were aiming at selling heifers for production during a period of seasonal increase in milk prices. The sales in October were probably an effort of the owners to sell animals off pasture and not carry them into the winter barn feeding season.

Figure 3. MONTHLY HEIFER SALES
12 Part-time Growers, New York State, 1962

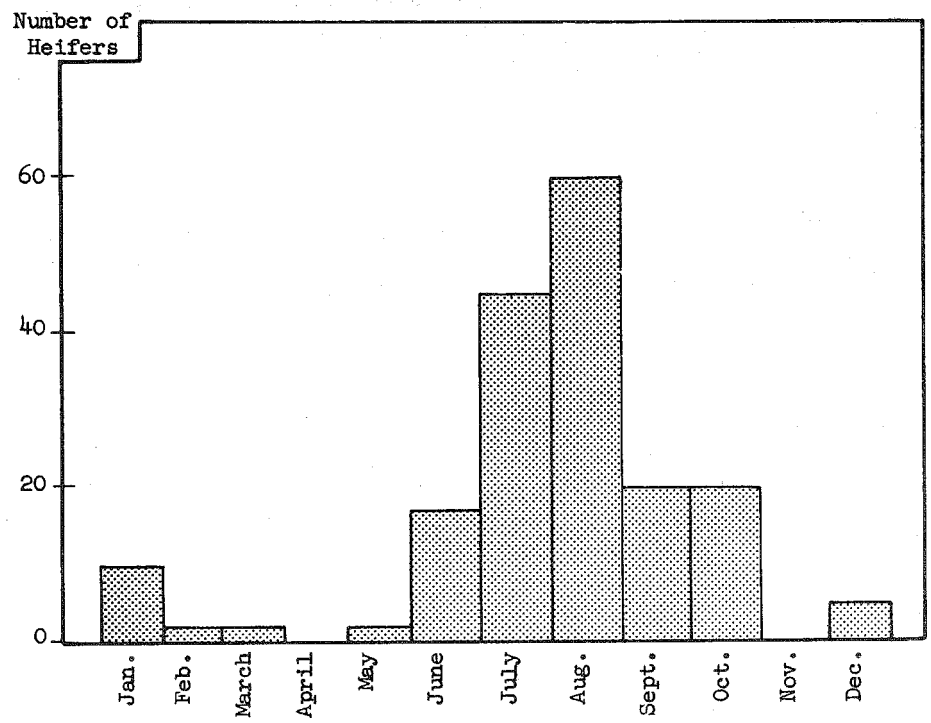
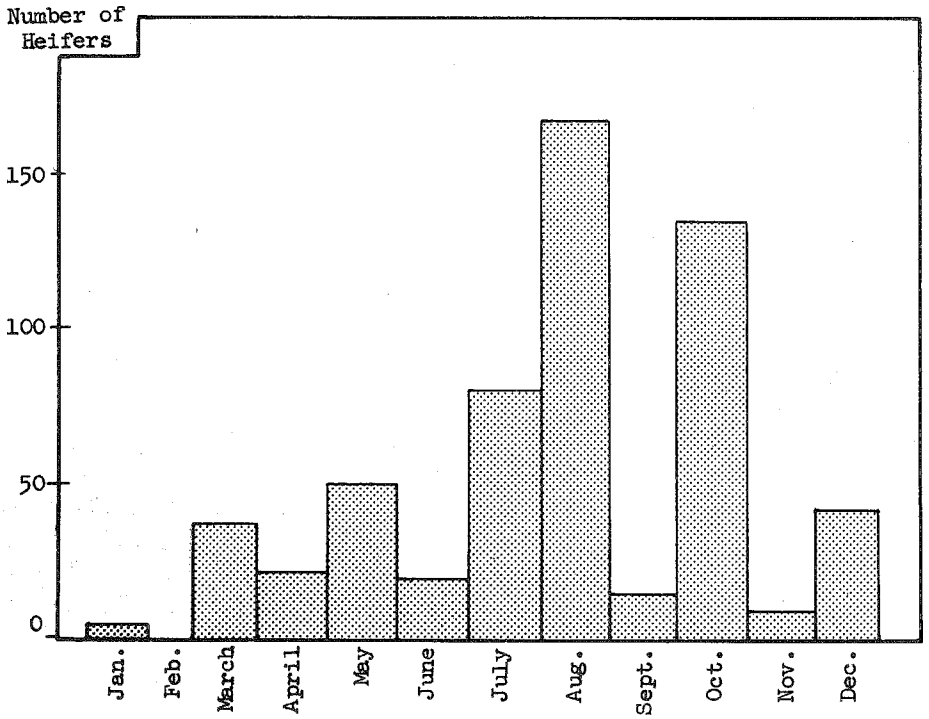


Figure 4. MONTHLY HEIFER SALES
8 Commercial Growers, New York State, 1962



Numbers of Heifers Sold

The eight commercial operators sold a total of 604 heifers in 1962, three times as many as the 202 sold by the 12 part-time growers. Three commercial farmers sold one hundred or more heifers each. None of the part-time farmers sold nearly as many heifers (Table 7).

Table 7. NUMBER OF HEIFERS ON HAND SOLD IN 1962
20 Farms, New York State, 1962

Farm Operation Number	Mature Heifer Equivalent Raised	Average* Heifer Inventory	Number of Heifers Sold
Commercial:			
A	150	359	100
B	70	165	70
C	68	170	97
D	65	190	120
E	59	160	60
F	52	110	110
G	49	80	20
H	43	106	27
	Total		604
Part-time:			
I	26	37	52
J	22	48	0
K	20	56	45
L	16	40	16
M	16	38	20
N	14	35	18
O	12	31	14
P	10	20	0
Q	8	15	10
R	6	8	16
S	6	10	4
T	4	8	7
	Total		202

* Average heifer inventory calculated as follows: Beginning Inventory + Ending Inventory ÷ 2 = Average Heifer Inventory.

Future Marketing Plans

Inquiries as to future plans indicated that four commercial and three part-time growers believed that 100 heifers sold per year would be an ideal volume. All other commercial growers indicated a larger number, while the other part-time growers suggested a smaller number or were undecided (Table 8).

Table 8. A FREQUENCY DISTRIBUTION OF IDEAL NUMBER OF HEIFERS SOLD ANNUALLY
20 Farms, New York State, 1962

Number of Heifers Sold	Number of Growers	
	Commercial	Part-time
Less than 49	0	4
50 - 99	0	2
100	4	3
200	2	0
300	1	0
400	0	0
500	1	0
Undecided	0	3
Total	8	12

COSTS AND RETURNS

The four major subdivisions of the cost of producing a heifer were:

1. Cost of the calf.

2. Cost of labor.

3. Feed and bedding which included milk or milk replacer, own grain, purchased grain, hay, silage, other feed, pasture and bedding.

4. Miscellaneous costs which included equipment and power, use of buildings, breeding fees, veterinary service, insurance, registration and transfers, lights and water, interest on investment and all other.

A substantial difference in the average cost to raise a heifer was found between the commercial and the part-time heifer growers. The eight commercial growers had an average cost of $286 to raise a heifer compared to $349 for the part-time growers (Table 9).

Table 9. HEIFER RAISING COSTS
20 Farms, New York State, 1962

Average per Heifer	8 Commercial*		12 Part-time**	
Physical Inputs:				
Own grain (pounds)	681		641	
Purchased feed (pounds)	331		761	
Hay (tons)	2.9		4.0	
Silage (tons)	3.5		1.5	
Labor (hours)	21		44	
Cost:				
Value of calf at birth		$ 36		$ 29
Milk and milk replacer	$ 2		$ 7	
Own grain	16		13	
Purchased feed	15		37	
Hay	58		82	
Silage	21		9	
Other feed	3		1	
Bedding	17		9	
Pasture	14		10	
Total feed and bedding		146		168
Labor		28		61
Equipment and power	17		12	
Building use	13		26	
Breeding fees	1		6	
Veterinary service	4		6	
Registration	1		1	
Insurance	1		2	
Lights and water	4		4	
Interest	27		21	
All other	8		13	
Total miscellaneous costs		76		91
Total cost		$286		$349

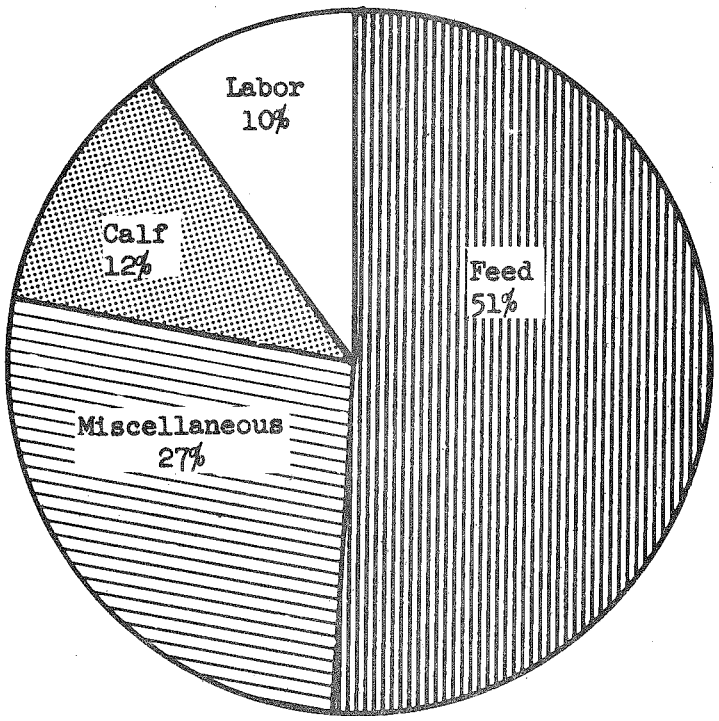
* 40 to 150 mature heifer equivalents.
** 5 to 40 mature heifer equivalents.

Although the commercial growers paid more for calves, their costs for feed, labor and miscellaneous costs were enough less to enable them to produce a heifer at $63 less.

Relative Importance of Major Divisions of Cost

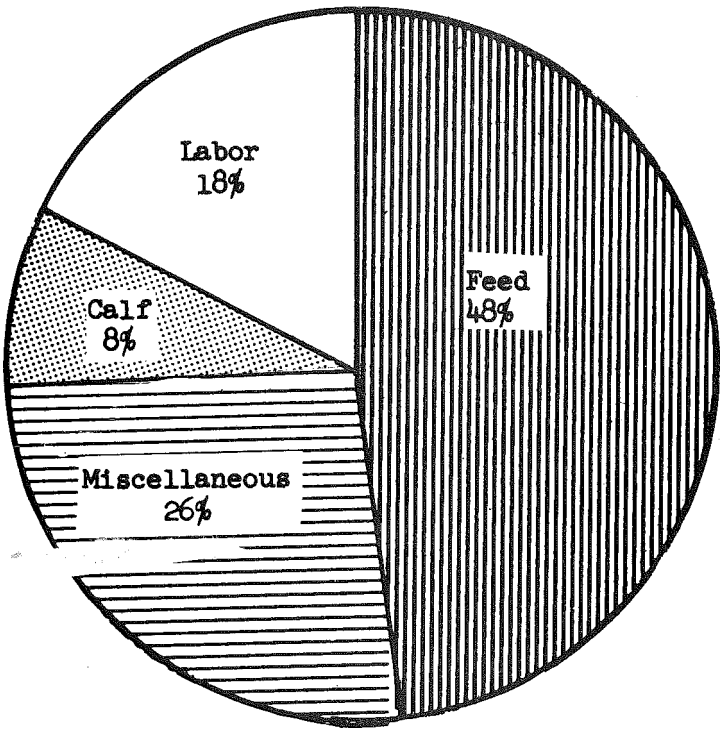
The average feed and bedding cost for the eight commercial growers was $146 or about 50 per cent of the total cost; 21 hours of labor cost $28 or about 10 per cent, and miscellaneous costs averaged $79 or 27 per cent. The value of the calf at birth made up the remaining 12 per cent of the total cost (Figure 5).

Figure 5. RELATIVE IMPORTANCE OF VARIOUS ITEMS OF COST TO RAISE A HEIFER
8 Commercial Farms, New York State, 1962



The twelve part-time growers had an average feed and bedding cost of $168 or 48 per cent of the total cost; 44 hours of labor cost $61 or 18 per cent, and miscellaneous costs averaged $91 or 26 per cent. The value of the calf at birth was 8 per cent of the total (Figure 6).

Figure 6. RELATIVE IMPORTANCE OF VARIOUS ITEMS OF COST TO RAISE A HEIFER
12 Part-time Farms, New York State, 1962



Returns

The total return per heifer averaged $290 for the part-time and $301 for the commercial growers. Since the costs were much higher for the former, their net gain per heifer was much less.

Five of the eight commercial growers realized a profit, while only one of the twelve part-time growers covered all costs. The part-time growers had an average loss of $59 per heifer compared to a gain of $15 for the commercial growers (Table 10).

Table 10. COSTS AND RETURNS PER HEIFER
20 Farms, New York State, 1962

Item	Commercial	Part-time
Number of farms	8	12
Average mature heifer equivalents per farm	70	13
Total return per heifer	$301	$290
Total cost per heifer	286	349
Net difference per heifer	$ 15	-$ 59

Variation in Costs

A substantial variation in the average cost to produce a heifer existed within groups of both commercial and part-time growers. The commercial grower costs ranged from a low of $164 to a high of $424 per heifer, while the part-time growers had a range of $249 to $479 per heifer (Table 11).

Table 11. A FREQUENCY DISTRIBUTION OF AVERAGE COST TO RAISE A DAIRY HEIFER
20 Farms, New York State, 1962

Total Cost Dollars	Number of Farms	
	Commercial	Part-time
Less than 200	1	0
200-249	2	1
250-299	3	0
300-349	0	7
350-399	1	1
400-449	1	2
450 or more	0	1
Total	8	12

The commercial growers paid an average of $36 for a calf one week of age, while the part-time growers paid $29. Three of the commercial growers were purchasing only registered animals at a premium price, while only two of the part-time growers were purchasing this type of calf.

The type and amount of feed used in raising the heifers accounted for most of the $22 difference in feed and bedding. The part-time farmers fed more hay and less silage; a larger part of the ration was grain, and a higher proportion of this was purchased and at a higher cost per ton.

Stored roughage, either hay or silage, was fed on all farms. The eight commercial farms reported an average of 4.4 tons of hay equivalent fed per heifer at an average cost of $79, while the 12 part-time farms reported an average of 4.6 tons of hay equivalent fed at a cost of $91, a difference in cost of $12 per heifer. The commercial growers got more of the roughage which they fed from silage and less from hay. On the average the eight commercial farms obtained 2.9 tons of hay equivalent from dry hay and 1.5 tons from silage.3/ The part-time farms obtained 4.0 tons of hay equivalent from dry hay and 0.6 ton from silage.

Five part-time and three commercial growers fed only dry hay; all other growers reported some combination of hay and silage fed.

Pasture costs for the commercial growers averaged $17 per heifer. The part-time growers had an average cost of $10.

The commercial growers fed less grain, an average of 1,011 pounds at a cost of $30 per heifer, compared to the part-time growers with an average of 1,402 pounds worth $50. Both groups fed about 650 pounds of home-grown grain at an average cost of about $14, but the part-time growers fed more than twice as much (761 pounds versus 331 pounds) purchased grain. In addition, the grain purchased by the part-time group cost more per hundredweight than the grain purchased by the commercial growers.

The commercial growers spent $5 more for bedding than did the part-time farmers. This was not unexpected, since loose housing arrangements require more bedding than stanchion barns, and all of the commercial growers housed heifers in some form of loose housing.

The $22 advantage in feed and bedding cost enjoyed by the commercial growers was a result of feeding more silage and less and cheaper grain than the part-time growers. These more than offset their higher pasture and bedding costs.

Wide variation in the number of man hours required to care for a heifer from birth to freshening was noted. The part-time growers required an average of 44 hours, more than double the 21 hours required by the eight commercial growers.

This difference was due in part to the degree of mechanization of handling feed and manure, type of housing system and number of heifers in the operation.

3/ Using a rate of three tons of silage equals one ton of hay equivalent.

As previously noted, the commercial farmers fed more silage and less dry hay than the part-time growers. The silage was fed mechanically on four of the eight commercial, but only one of the 12 part-time farms. Although such mechanical feeding involves investment in equipment and therefore increased equipment cost, this increase is less than the savings resulting from reduced labor (Table 12).

Table 12. TYPE OF ROUGHAGE FED, LABOR AND EQUIPMENT COST PER HEIFER 20 Farms, New York State, 1962

Group	Number of Farms	Number of Heifers	Tons Dry Hay	Tons Silage	Labor		Equipment Cost
					Hours	Cost	
Part-time	12	13	4.0	1.5	44	$61	$12
Commercial	8	70	2.9	3.5	21	$28	$16

All the commercial farms used loose housing which permitted the use of a tractor and lift scoop to handle manure. This housing arrangement also allowed the operator to care for a large number of heifers in one pen. The result was that the commercial growers could care for a heifer in 23 hours less time and for $33 less than the part-time owner.

Commercial growers had a total miscellaneous cost of $79 which was $12 lower than that of the part-time growers. The main difference was in building cost. The charge for building use was $26 for the part-time growers compared to $13 for the commercial growers. This difference represented a more efficient use of buildings by commercial growers who kept the buildings filled to near capacity most of the time.

A CONSIDERATION OF PART-TIME GROWERS

Since most of the part-time growers had substantial income from urban employment or social security benefits, it is probable that they did not have the same economic motives as the commercial growers. They might not expect the income to cover overhead expenses as long as out-of-pocket expenses were met.

The out-of-pocket costs that they might expect to cover would be: cost of calf, cost of feed and bedding, hired labor, breeding fees, veterinary service and registration and transfer fees. If the return for the heifer exceeded the cost of these, the enterprise might well be considered successful for farmers with vacant barns, idle time and other sources of income.

The average out-of-pocket cost per heifer for the twelve part-time operators was $226 (Table 13).

Table 13. ADJUSTED COST PER CALF*
12 Part-time Farms, New York State, 1962

Item	Cost
Cost of calf	$ 29
Total feed and bedding	168
Hired labor	17
Breeding fees	6
Veterinary service	6
Registration and transfers	1
Total	$226

* Includes out-of-pocket costs only.

These operators sold their heifers for an average of $290, or $64 more than the out-of-pocket costs. If a farmer is willing to charge his time and his capital costs to personal enjoyment, he can stay in business for a long time. Farmers who compute costs in this manner should recognize the nature of their profits and make management decisions accordingly.

ANALYSIS OF COMMERCIAL GROWERS

The eight commercial farms were subdivided into large commercial and small commercial farms. The four large commercial had 60 or more mature heifer equivalents and the four small commercial reported 40 to 60 mature heifer equivalents.

Considerable variation in the cost to produce a heifer was noted when the four larger commercial farms were compared with the four smaller commercial farms. It was found that the cost of calves, feed and bedding and labor were all less per heifer for the larger heifer enterprises (Table 14).

Table 14. COSTS FOR LARGE AND SMALL COMMERCIAL HEIFER ENTERPRISES 8 Farms, New York State, 1962

Item	Commercial Farms	
	Large	Small
Physical factors:		
Number of farms	4	4
Average mature heifer equivalent	88	51
Inputs per heifer:		
Dry hay (tons)	2.1	3.7
Silage (tons)	6.1	0.8
Labor (hours)	17.7	24
Cost:		
Cost of calf	$ 14	$ 58
Feed and bedding	130	159
Labor	22	34
Miscellaneous	78	79
Total	$244	$330

Considerable differences in net returns per heifer between the large and small commercial growers were noted. The four large commercial farms produced heifers at an average cost of $244 and sold them for $287 for a gain of $43. Of the four small commercial growers three showed a loss on the enterprise. The average loss of four small commercial growers was $14. It is noteworthy that the average price received by the large farms was $28 less than that received by the small commercial farms, but the large farms experienced an average cost that was $86 less. The savings in cost were thus enough to more than offset the lower return per heifer (Table 15).

Table 15. COSTS AND RETURNS PER HEIFER
8 Commercial Farms, New York State, 1962

Farm Number	Mature Heifer Equivalent	Average per Heifer		
		Gross Cost	Gross Return	Net Return
A	150	$271	$315	$44
B	70	164	250	86
C	68	242	263	21
D	65	297	320	23
Average	88	$244	$287	$43
E	59	$424	$380	-$44
F	52	278	250	- 28
G	50	370	340	- 30
H	43	246	292	46
Average	51	$330	$318	-$14

CONTRACT ARRANGEMENTS FOR GROWING DAIRY HEIFERS

Some farmers, convinced of the advantages of specializing in milk production and wishing to purchase heifers, but concerned about breeding and quality, have hired a heifer specialist to raise replacements on a contract basis.

To learn more about these arrangements, a study was made of four heifer growers visited in 1962 and other growers contacted in 1961 by Mr. Lynn Stanton, an Extension Economist at Cornell University.

Advantages and Disadvantages of Contracting Arrangements

A milk producing dairyman can, through contracting, get replacements of quality similar to the rest of his herd thus avoiding the risk of purchasing animals from unknown ancestors; he can specialize and make more intensive use of facilities; he can keep more cows without a large additional capital investment in buildings and land, and he may obtain better heifers if they do not have to compete with cows for good quality roughage.

Contracting provides the heifer grower with a dependable source of healthy calves, enables him to specialize and obtain increased efficiency, and makes possible a large livestock enterprise without a large capital investment.

The dairyman has the disadvantage of requiring a substantial out-of-pocket payment for replacements; he may have the difficulty of handling very young calves if the grower sets a minimum age of acceptance, and the replacements may not be so well grown as they would be if raised by the dairyman.

Disadvantages to the heifer grower may include slow payment if the dairyman is periodically hard pressed financially; also, if only one herd is utilized as a source of heifers, a grower's program may be upset when the source herd produces an abnormal number of bull calves.

Both parties have the uncertainty of duration of the contract, especially if reliance is on only one contracting party.

Factors Determining Success of Contracting

Any dairyman and heifer grower contemplating a contractual arrangement should be reasonably sure the arrangement will be mutually satisfactory.

The dairyman faces questions such as:

Will the contract arrangement allow a larger, specialized milk cow herd?

Will the grower follow management practices that are acceptable to the dairyman?

Will the contract arrangement decrease cost or increase income?

Does the grower have successful experience with dairy cattle?

Does the grower have large quantities of high quality forage available?

Heifer growers considerations are:

Will the contract provide a bonus for a job well done?

Will the dairyman supply healthy calves?

Will the rate of payment be adequate to cover both out-of-pocket and overhead costs?

Will the heifer-raising enterprise be large enough to be efficient and permit low cost without lowering quality of heifers?

Types of Arrangements

Two basis types of contract arrangements were reported. Under one system the title to the heifer is retained by the dairyman, and under the other title passes to the grower. Other details of the contracts may be similar. These arrangements are:

Direct Contract to Grow Heifers in which case the dairyman retains title to the heifer and keeps control over her. The heifer grower raises the heifer and supplies all or a major portion of the inputs for a monthly cash payment.

Essentially the dairy farmer obtains the use of facilities without owning them. Also, responsibility for the day-to-day chores in tending the heifers are transferred to the grower.

The rate of the specified monthly payment by the dairyman to the grower will vary according to the inputs and services the grower provides. The grower usually supplies all roughage and grain, bedding, housing and labor. Routine veterinarian care such as vaccinations and dehorning may be paid for by either party, and unforeseen expenses such as emergency veterinarian care should be provided by mutual agreement.

Most direct contract growers received the same rate per month per heifer regardless of age. One variation of this is payment based on rate of gain. Under this system the grower receives a specified monthly payment of $9 or $10 per month, but the final price paid for the heifer is a specified payment per pound of gain. Twenty-five cents per pound was the most common figure reported in New York State.

Option to Purchase Contract in which case the title to the heifer passes to the grower, who is responsible for raising the heifer. The only restriction on the disposition of the heifer is that the dairyman has the first opportunity to purchase the animal. Under this system the main disadvantage to the grower is that he must pay all expenses incurred in growing a heifer without any compensation until the animal is ready to sell. A major disadvantage to the dairyman is that he must invest substantial amounts of capital at one time.

Under the option to purchase contract there are two common arrangements for payment. The first is for the dairyman to sell the calf to the grower at bob-calf price and then repurchase the heifer at the current market price. Because of disagreement over the market price of calves and heifers, a second method of payment has evolved. This specifies a uniform price to be paid by the grower when purchasing either registered or grade calves and also specifies a price and age at which the dairyman is entitled to repurchase the heifers.

Prices Paid for Raising Heifers

Monthly payment rates to the growers on either a direct contract or some form of option-to-purchase contract range from $8 to $13. In this survey four growers received $9 or less per month but did not supply as many of the inputs as the other growers (Table 16).

Table 16. PRICES PAID FOR HAVING HEIFERS GROWN ON CONTRACT
14 New York State Farms, 1961-62

Price Paid per Head per Month	Number of Farms	Average Price per Head per Month
$9 or less	4	$ 8.95
$10 to $11	5	10.30
$11 or more	5	12.00
All farms	14	$10.50

Points to Consider in Formation of Contracts: Either direct contracts or option-to-purchase contracts should be drawn by a competent legal advisor. Some of the points that should be considered are:

Relationship of Parties: The legal relationship between the parties should be specified if possible. Is the grower acting as agent for the dairyman, is he a contractor, or is he a hired man?

Term of Contract: The period of time the contract is to be in existence should be specified, and provision should be made for automatic renewal unless one party is dissatisfied.

Termination of Contract: The contract should be subject to cancellation by mutual agreement in writing. A unilateral termination should be several months in advance to give the dairyman a chance to find an alternative grower or to allow the grower to find another source of calves.

Provide for Arbitration: Honest men sometimes disagree because of misunderstanding or confusion about some item, and this should be recognized when drawing a contract. An automatic provision for arbitration included in the contract can provide a legal and just method to solve serious disputes.

Delivery and Repossession: The contract should specify who will deliver the calves to the grower and who will deliver the bred heifers to the dairyman.

Method and Rate of Payment: Provisions for payment should be set forth in direct language including the method of calculation of payment, the date the payment is due and the amount of the final payment.

Supplies Furnished: The contract should include agreements as to supplies to be furnished by the dairyman. For example, if the dairyman provides special feed, the fact should be specified.

Management Decisions: The responsibility of the grower and of the dairyman for items such as teat removal, pregnancy examinations, lice or other pest control should be set forth.

Identification: The contract should specify the manner in which each animal is to be identified. Some common methods are the use of ear tatoo, ear tag and neck tag. A few growers use photographs, but this is expensive for large operations.

Routine Veterinarian Care: Responsibility for vaccinations, tests and other routine veterinarian care should be specified. If calves are to be dehorned, the method or age may be included as well as who pays for it.

Liability for Death Loss: The person to stand the loss or the manner in which the loss is to be divided between the grower and the dairyman should be set forth.

Liability for Fire Insurance: The amount of fire insurance on the heifers and the person to whom it will be paid should be specified.

Assignment of Interests: Provision is needed as a part of the contract to allow either party to assign his rights and obligations under the contract to someone else in the event of disability or death.

Age or Weight at Delivery and Recall: It may be desirable to specify a minimum age and/or weight at which the dairyman will accept the heifer back into his herd and also the age and/or weight at which the grower obtains the calves. Some agreements specify age and others weight as the basis. Weights such as a 100 pound or 150 pound calf at delivery to the grower with a 1,000 or 1,100 pound heifer to be returned to the dairyman may be used. If the rate of payment is based on rate of gain by the heifers, it should be clearly understood and stated that the rate of gain under discussion is the cumulative weight gain rather than a gain for a short period of time.

Breeding: Breeding arrangements such as whether natural or artificial insemination is to be employed, the responsibility for payment for the service and selection of type of bull, either dairy or beef, should be specified.

This list is not complete but contains some of the more important points to be considered by the grower and the dairyman.

COMPARISON OF COSTS OF REPLACEMENT HEIFERS FROM VARIOUS SOURCES

As noted earlier, the three sources of heifers are (1) purchased replacements, (2) home-grown replacements and (3) replacements raised under contract by a heifer-growing specialist.

Purchased Replacements

No report of the average price for dairy heifers is available, but the Crop Reporting Service does report the average price of milk and slaughter cows (Table 17).

Table 17. AVERAGE PRICE FOR SLAUGHTER AND DAIRY COWS
New York State, 1958-62

Year	Average Price per Head	
	Milk Cows	Slaughter Cows
1958	$255	$173
1959	284	178
1960	278	158
1961	260	154
1962	247	144
Average per year	$264	$161

SOURCE: New York State Agricultural Price Reports, New York Crop Reporting Service, Department of Agriculture and Markets, Bureau of Statistics

These data indicate that over the past five years dairymen have paid an average of $264 for a purchased milk cow, which may be slightly low for high quality, springing dairy heifers.

Raising Own Replacements

The cost of raising heifers as a secondary enterprise in connection with a dairy herd on New York State Cost Account farms in four recent years averaged $319 (Table 18).

Table 18. COSTS TO RAISE DAIRY HEIFERS
New York State Cost Account Farms
Selected Years

Year	Average Cost per Heifer
1956	$297
1958	336
1960	321
1961	320
Average cost	$319

SOURCE: Average Enterprise Costs and Returns 1956 and Livestock Costs and Returns 1958, 1960, 1961, New York. Farm Cost Accounts. Department of Agricultural Economics, Cornell University.

Contracting for Raising of Replacements

Dairymen having heifers grown on a contract paid an average of $10.50 per month per animal to a heifer-raising specialist. Assuming an average freshening age of 27.5 months, this means an average cost of $289 per heifer in addition to the value of the calf at birth and any inputs supplied by the dairyman.

Dairymen contracting heifers grown by weight are paying $0.25 per pound of gain. Assuming an average gain of 1,000 pounds per heifer, this system would cost the dairyman $250 plus the value of the calf at birth.

Comparison of Costs

A direct comparison of costs of obtaining replacements from the three common sources indicates that home-grown replacements are often the most expensive alternative (Table 19).

Table 19. COSTS OF OBTAINING DAIRY REPLACEMENTS BY SOURCE
New York State, 1962

Source	Average Cost per Heifer
Home raised	$303*
Contract by month ($10.50 per month)	289
Purchase	264**
Contract by weight ($0.25 per pound of gain)	250

* Average value of $22 for bob calf subtracted to make data comparable
** Based on averages for dairy replacements and including value of calf in cow

Final decisions by commercial dairymen as to the source of the needed dairy replacements will vary. Dairymen interested in obtaining a maximum labor income will obtain replacements from the cheapest source that is consistent with their quality standards.

Dairymen interested in expanding size of business with a minimum of additional capital can accomplish this with purchased replacements. If the resources devoted to care of young stock are switched to care of milk cows, profits can be substantially increased.

A dairyman holding the opinion that purchased replacements are inferior to home-raised heifers in milk production potential might find a contractual arrangement the best solution to his dairy replacement problem.

A final decision as to the source of dairy replacements will be determined by the resources available to each individual and his personal goals.

SAMPLE CONTRACTS FOR OBTAINING DAIRY HEIFERS

Contract for Option to Purchase at Specified Age and Price

THIS AGREEMENT, made this _____ day of _____, 19___, by and between _____, Grower, and _____, Dairyman.

It is hereupon agreed as follows:

1. The Grower agrees to buy and the Dairyman hereby agrees to sell as a calf the animal described on the back of this page for the following price:

Registered calf $50.00
Grade calf. 25.00

This amount to be (1) Deducted from the sale price of the animal at the time the Dairyman decides to take the option and repurchases the animal, or (2) Paid at the time the Dairyman decides not to take the option to buy, or (3) In the event of injury or sickness the Grower reserves the right to dispose of the animal immediately to minimize the loss, and in such case the payment will be made at the time the animal is disposed of, or (4) In case of death of the animal by a cause which is covered by insurance, the payment will be made at the time the claim check is received by the Grower. In the case of death of the animal by a cause which is not covered by insurance, both Grower and Dairyman will lose their investment in the animal.

2. The Grower agrees to give the original owner the first option of buying the animal back at the following ages and prices:

	Registered	Grade
Six months	$125.00	$100.00
Twelve months	175.00	150.00
Eighteen months	250.00	225.00
Freshening age	325.00	300.00

3. The Grower agrees to do the following:

(a) Dehorn animal at less than 2 months of age
(b) Vaccinate for brucellosis between the ages of 4 and 8 months
(c) Insure the animal with coverage by a policy that is satisfactory to the Dairyman.
(d) Breed as near as possible so that the animal will freshen at 24 months of age.

_____
Grower

_____
Dairyman

Contract for Option to Purchase with No Specified Price

Clause 1 - PARTIES INVOLVED: This contract is entered into this _____day of _____ 19___, between _____, the Grower, of _____, County of _____, State of _____, and _____, the Dairyman, of _____, County of _____, State of _____.

Clause 2 - TERM OF CONTRACT: The term of this contract shall be from the _____ day of _____, 19___, to the _____ day of _____ 19___, and shall be automatically renewed from year to year unless otherwise terminated in accordance with the provisions herein or amended in writing as mutually agreed upon.

Clause 3 - TERMINATION OF CONTRACT: This contract may be terminated at any time by mutual agreement in writing; or by at least ____ months written notice from either party prior to the renewal date.

Clause 4 - ARBITRATION: Any dispute arising under the terms of this contract may be referred by the parties hereto to an arbitrator, or if one person cannot be found who is acceptable to both parties, then each shall choose an arbitrator, and the two chosen shall select a third. The majority decision of the arbitrator(s) shall be presented in writing. The arbitrator(s) shall have the power to make an award or determination on any issue which arises out of the contract, and it shall be binding on both parties. The expenses of the arbitrator(s) shall be divided equally between the parties. Pending final decision of a dispute hereunder, the parties hereto shall proceed diligently with the performance of the contract.

Clause 5 - TITLE TO HEIFERS: The Dairyman hereby agrees to give the Grower possession of the title to the animals listed on the Description Sheet and made a part hereof. The Grower agrees to assume all legal responsibility as owner of the animals listed on the Description Sheet and will not hold the Dairyman liable for any injury or death losses to the animals, except those due to negligence on the part of the Dairyman, after both parties have initialed the attached Description Sheet.

Clause 6 - PURCHASE BY GROWER: The Dairyman agrees to sell to the Grower such animals as listed on the Description Sheet attached hereto, that he anticipates repurchasing from the Grower. The animals will be paid for by the Grower to the Dairyman at the rate of _____ dollars per head. The transfer date, from the Dairyman to the Grower, shall be within _____ weeks, following _____ months of age for each animal. The _____ shall be responsible for transportation expenses of moving heifers from the Dairyman's farm to the Grower's farm.

Clause 7 - ADDITIONAL ANIMALS: Additional animals may be added to this contract, and all conditions of the contract shall apply to the additions. Both parties shall initial entries and exits on the Description Sheet of all original and additional animals.

Clause 8 - VETERINARIAN CARE: The following vaccinations will be given at the Grower's expense:

Vaccination	Age
Brucellosis	4 to 8 months
_____	_____
_____	_____

Test	Age
_____	_____
_____	_____
_____	_____

The Grower also agrees to inoculate all animals for hemorrhagic septicemia within _____ days of delivery to the Dairyman. The Grower agrees to dehorn all animals at _____ months of age and to remove all extra teats at _____ months of age. All routine and special veterinarian care shall be paid for by the Grower.

Clause 9 - REPURCHASE BY DAIRYMAN: The Grower of the animals listed on the Description Sheet does hereby agree to offer to the Dairyman first option to purchase any or all of the animals so listed. The Dairyman shall purchase said animals at, or within _____ weeks following, _____ months of age or in any event at least _____ weeks before freshening. The animals will be paid for by the Dairyman to the Grower at a rate mutually satisfactory based on current market prices. All heifers will be paid for in full before leaving the possession of the Grower. The _____ shall bear all transportation charges of moving the heifers from the Grower's farm to the Dairyman's farm.

Clause 10 - BREEDING: The Grower further agrees to have the heifers bred at his expense by the following method: _____
_____
_____ at _____ months of age or at _____ pounds of weight.

Clause 11 - IDENTIFICATION: The Dairyman agrees to identify each animal listed on the Description Sheet by the following method: _____
_____
and the Grower agrees not to alter this identification in any way.

Clause 12 - OTHER CONDITIONS: The Grower shall be free to make any management decisions he chooses in matters not included in this contract. He shall render all decisions as to amount and quality of feedstuffs, and he shall have sole responsibility for all decisions regarding fire insurance on the heifers. The Grower agrees not to mortgage animals included in this contract.

Clause 13 - ASSIGNMENT OF INTERESTS: In the event either party to this contract shall be unable to perform due to death or disability, the rights and obligations of the party no longer able to perform may be assigned to a third party by his successors or assigns, subject to written approval of the other original party.

Clause 14 - NON-EXERCISE OF OPTION: The Dairyman may elect not to purchase certain animals listed on the Description Sheet. Heifers that the Dairyman so elects not to purchase as set up in this contract shall be disposed of by the Grower.

Witness the hand and seal of the undersigned parties this _____ day of _____, 19___.

_____ Witness _____ Grower
_____ Witness _____ Dairyman

Contract for Raising Dairy Replacements on a Direct Contract

Clause 1 - PARTIES: This contract is entered into this _____ day of _____ 19___, between _____, the Grower, County of _____, State of _____, and _____, the Dairyman, of _____, County of _____, State of _____. The Grower is an independent contractor in this relationship.

Clause 2 - TERM OF CONTRACT: The term of this contract shall be from the _____ day of _____, 19___, to the _____ day of _____, 19___, and shall automatically be renewed from year to year unless otherwise terminated in accordance with the provisions herein or amended as mutually agreed upon.

Clause 3 - TERMINATION: This contract may be terminated at any time by mututal agreement in writing, or by at least _____ months written notice from either party prior to the annual renewal date.

Clause 4 - ARBITRATION: Any dispute arising under the terms of this contract may be referred by the parties hereto to an arbitrator, or if one person cannot be found who is acceptable to both parties, then each shall choose an arbitrator and the two so chosen shall elect a third. The majority decision of the arbitrator(s) shall be presented to both parties in writing. The arbitrator(s) shall have the power to make an award or determination on any issue which arises out of the contract, and it shall be binding on both parties. The expenses of the arbitrator(s) shall be divided equally between the parties.

Pending final decision of a dispute hereunder, the parties hereto shall proceed diligently with the performance of the contract.

Clause 5 - DELIVERY AND REPOSSESSION: The Dairyman is responsible for delivery of the animals to the Grower between _____ and _____ months of age. The Grower is responsible for returning said animals to the Dairyman's farm between _____ and _____ months of age or at any date the Dairyman may elect and make known in writing at least _____ days ahead of time whichever time is earlier.

Clause 6 - ADDITIONAL ANIMALS: Additional animals may be added to this contract, and all conditions of the contract shall apply to the additions. Both parties shall initial the entries and exits on the Description Sheet of all original and additional animals.

Clause 7 - MINIMUM NUMBER OF ANIMALS: The Dairyman agrees to keep a minimum of _____ animals of all ages in the care of the Grower at all times.

Clause 8 - TITLE TO ANIMALS: The Grower hereby agrees to accept possession of the animals listed on the Description Sheet attached hereto and made a part hereof.

It is agreed that the title to said animals shall at all times remain with the Dairyman.

Clause 9 - VETERINARIAN CARE: Heifers are to be dehorned when Grower receives them or Dairyman will be charged _____ dollars per calf for dehorning. Heifers are to be inoculated for hemorrhagic septicemia within a week of shipment to Grower and also within a week of shipment back to Dairyman. Any expense for this inoculation shall be paid by the _____. All extra teats are to be removed at the Dairyman's expense at _____ months of age.

Other veterinary services than those incurred from reproductive disorders or otherwise specified in this contract will be engaged at the judgment of the Grower and will be shared equally by Grower and Dairyman.

Clause 10 - VACCINATION AND TESTS: The following vaccinations will be given at the Dairyman's expense:

Vaccination	Age
Brucellosis	6 to 8 months
_____	_____
_____	_____

Test	Age
_____	_____
_____	_____
_____	_____

Clause 11 - BREEDING: The Grower further agrees to have the heifers bred at his expense by the following method: _____

_____ at _____ (months of age) or when heifers weigh _____ pounds. The Grower agrees to have all heifers checked for pregnancy 60 to 90 days later. If not pregnant at this time, the Dairyman will be notified, and the heifers will be treated at the Dairyman's request and expense.

Clause 12 - LIABILITY FOR DEATH: In the case that an animal dies while under the care of the Grower and is not covered by insurance, one-half of any charges previously paid to the Grower by the Contractor will be returned by the Grower.

Clause 13 - IDENTIFICATION: Animals shall be permanently identified by _____ (eartag, photograph and/or ear tattoo) by the Dairyman before delivery to the Grower.

Clause 14 - OTHER CONDITIONS: The Grower shall supply all feed, housing and labor required to care for the heifers included on Description Sheet. The Grower agrees to treat animals on pasture and in the barn for fly, mange, lice or other parasite control using methods and materials approved by the Dairyman and all expenses of such parasite control shall be paid by the _____. The Grower agrees to notify the owner of any accidents, losses or injuries to the livestock within 24 hours for purposes of insurance and damages. The Dairyman retains ownership of the animals listed on the attached Description Sheet. The Grower will insure against fire, lightning, and extended coverage to the extent of $_____ plus the amount paid by the Dairyman to the Grower up to the time of loss.

Clause 15 - PREPAYMENT: The Dairyman, in return for the services, fees and facilities provided by the Grower, does hereby agree to make prepayment for each animal described herein or subsequently added to this contract in the amount of $_____ per month, from the date such animal is turned over to the Grower in accordance with this contract. All sums involved for prepayment of services, fees and facilities are due once a month for the preceding month.

Clause 16 - FINAL PAYMENT: The Dairyman shall pay the Grower $_____ per heifer for each month or fraction thereof which has not been paid as set forth in Clause 15 before the Dairyman may remove the heifer(s).

Witness the hand and seal of undersigned parties this _____ day of _____, 19___.

_____ Witness _____ Grower

_____ Witness _____ Dairyman

Contract with Payment Based on Incentive Plan

The contract just presented may be modified to serve as a guide for Growers and Dairymen interested in final payment based on weight gained. Clause 16 should be reworded as follows:

Clause 16 - FINAL PAYMENT: When the Dairyman takes the animal(s) from the Grower, a final payment shall be computed, based on the accumulative change in weight from the day the animal is delivered to the Grower until the day of exit or removal from the Grower. Weight change shall be determined as follows: _____

_____.

The basic rate for determining the total payment for each heifer will be _____ cents per pound of weight change from entry to exit from Grower's farm. The final adjustment in price shall be determined in the following manner: If the price per heifer based on weight change is greater than the amount paid out monthly, the Dairyman agrees to pay the Grower the extra cash due. If the amount due based on weight is less than the amount paid out monthly, the Grower agrees to refund the difference to the Dairyman.

Use, Conditions and Terms for Direct Contracting

Clause 3. A termination notice of three to six months will give the Dairyman a chance to find an alternative Grower or to readjust his replacement program. The Grower also needs a substantial length of time to readjust his plans.

Clause 15. A monthly payment ranging from $8 to $12 a month should be ample to cover cash and non-cash costs such as labor, forage and buildings incurred by the Grower. In the event the parties to the contract desire a variable rate of payment dependent on the age of the animals, this should be specified here. A possible practice would be a rate of payment of perhaps $15 per month for young animals, and a lower rate after the period of expensive feedstuffs is past.

Clause 16. (Incentive Plan) The blank in this section is provided to specify how the weight shall be taken, either by taping or actual scale weights. The price per pound of gain might be $0.20 to $0.30 per pound with $0.25 a common price in use. Both parties may agree on a minimum weight at freshening for the breed of heifers concerned and adjust the price per pound accordingly.

Description Sheet and Bill of Sale

A description sheet should be included with each of the sample contracts presented. A bill of sale similar to the one presented here should be included in the contracts in which title passes from the Dairyman to the Grower.

BILL OF SALE

K N O W A L L M E N B Y T H E S E P R E S E N T S:

That the undersigned, for valuable consideration, does hereby grant and sell unto _____ of _____, County of _____, State of _____ the following dairy cattle:

Breed	Eartag Number	Tattoo Number	Registration Number	Other Description

The undersigned warrants that he is the lawful owner of said dairy cattle; that are free from all encumbrances; that the undersigned has a good right to sell the same and will warrant and defend title thereto against lawful claims and demands of all persons.

Witness the hand and seal of the undersigned this _____ day of _____, 19____.

_____Seller

ANIMAL DESCRIPTION SHEET

Entry Initials		Date of Entry	Weight at Entry	Age at Entry	Eartag Number	Tattoo Number	Registration Number	Date at Exit	Weight at Exit	Exit Initials		Remarks
Grower	Contractor									Grower	Contractor	

GROWTH STANDARDS

Considerable work has been done on the relationship between size and age at breeding and freshening. Some desirable age and weight standards are presented for reference (Table 20).

Table 20. AGE AND WEIGHT STANDARDS FOR BREEDING AND FRESHENING HEIFERS

Kind	Breeding		Freshening	
	Age	Weight	Age	Weight
	(months)	(pounds)	(months)	(pounds)
Large breeds	14 to 16	750 to 800	25 to 27	1,100
Medium breeds	14 to 16	575 to 625	25 to 27	950
Small breeds	14 to 16	525 to 575	25 to 27	800

SOURCE: C. A. Mathews and M. H. Fohrman, Beltsville Growth Standards for Holstein Cattle, 1954

For Holstein heifers an average daily gain of 1.4 pounds from birth to 24 months results in a heifer of satisfactory size and development for freshening at two years of age.

Some growers have inquired as to how it is possible to feed calves on a milk replacer program that produces 1.0 to 1.2 pounds gain per day or to feed open or bred heifers only high quality roughage that produces 1.2 to 1.3 pounds gain per day and still meet a growth standard of 1.4 pounds.

It is important to distinquish between average rates of gain for long periods of time versus those for relatively short periods. This is discussed in an article by Merrill from which Table 21 and Figure 7 have been taken for illustration.

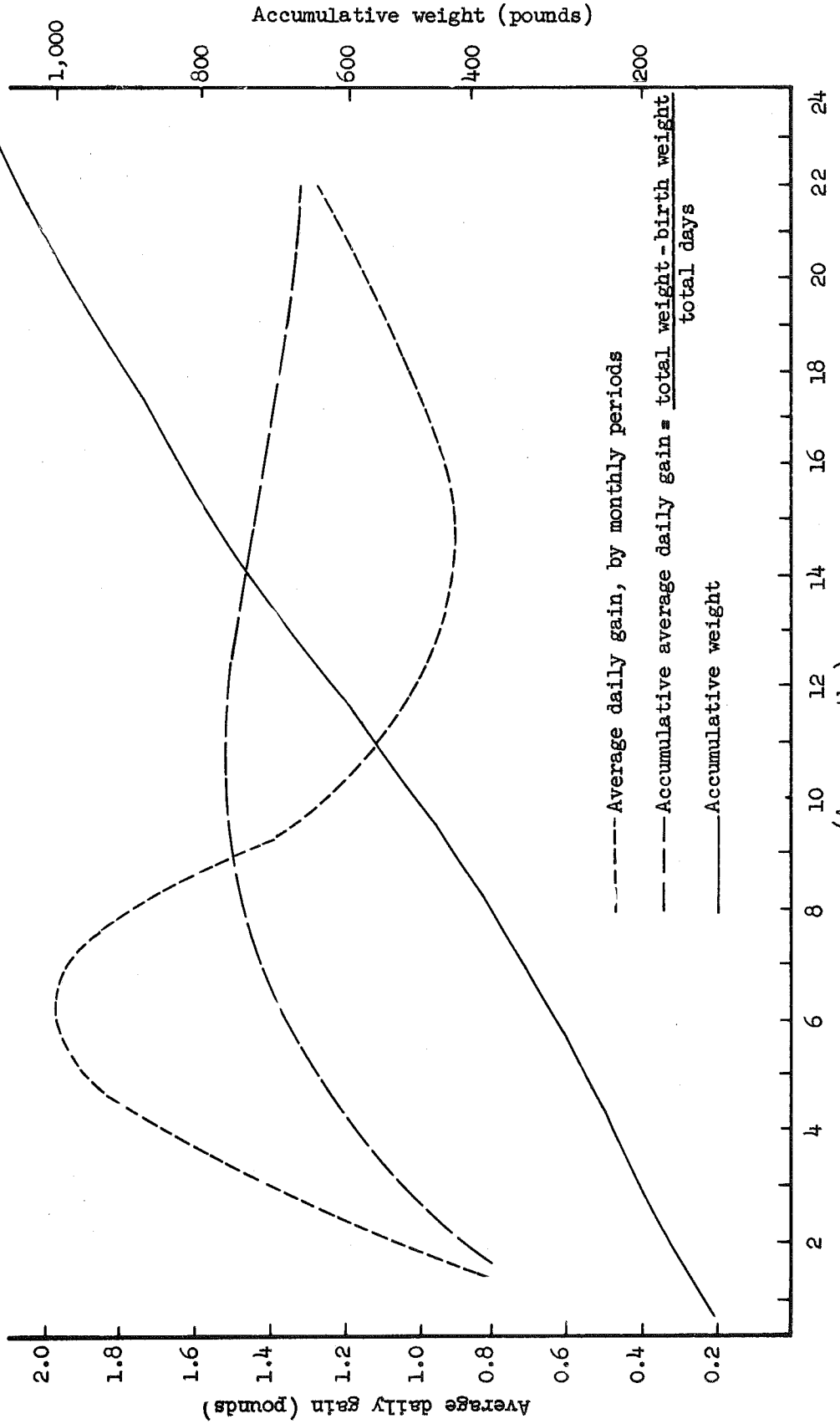
The 1.4 pounds gain per day is an accumulative average daily gain and does not reflect the actual rates of gain for short periods of growth. The gains made for short, specific periods may be termed monthly average daily gain and should not be confused with accumulative average daily gain.

Table 21. WEIGHT GAINS BY HOLSTEIN HEIFERS Selected Age Periods

Age Period in Months	Average Daily Gain in Pounds
0 to 2	.9 to 1.4
3 to 12	1.4 to 2.1
13 to 24	1.1 to 1.3

SOURCE: W. G. Merrill, Growth Patterns of Holstein Heifers. Farm Flashes, Department of Animal Husbandry, Cornell University, September 1961

Figure 7. GROWTH STANDARDS FOR HOLSTEIN HEIFERS



SOURCE: W. G. Merrill, Growth Patterns of Holstein Heifers. Farm Flashes, Department of Animal Husbandry, Cornell University, September 1961.

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