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COST OF RAISING DAIRY HEIFERS IN OREGON

Two years ending April 1, 1931

Progress Report No. 3  
Dairy Cost Study  
(Purnell Fund)

DEPARTMENT OF FARM MANAGEMENT  
AND  
DEPARTMENT OF DAIRY HUSBANDRY  
COOPERATING

<u>IT COSTS LITTLE MORE TO RAISE GOOD HEIFERS THAN POOR ONES</u>			
Lbs. B.F. Per Cow Annually	No. of Farms	Average Number of Pounds of Butterfat per Cow Annually	Average Cost of Raising Heifers
Under 250	153	211	\$78
250 - 350	289	297	\$81
Over 350	72	375	\$84

Corvallis, Oregon  
February, 1932.

## THE COST OF RAISING DAIRY HEIFERS IN OREGON

by

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This report presents information upon the cost of raising dairy heifers that was obtained in connection with the study of the cost of producing milk and butterfat in Oregon during the two years ending April 1, 1931. The cost of producing milk and butterfat during each of the two years has been presented in two previous progress reports. The study is being continued for a third year.

### Important to Consider Cost of Raising Heifers

The cost of new cows to replace those that die or are sold is an important item in the cost of producing milk and butterfat. The data obtained in this study indicate that about four-fifths of these replacements are raised by the dairymen, only one-fifth being purchased. During the year ending April 1, 1931, an average of four heifers per farm were raised on the 514 farms in this study. It is apparent, therefore, that the cost of raising heifers deserves careful consideration.

The cost of raising heifers is of significance, also, in connection with the California demand for Oregon dairy cattle. At what price can an Oregon dairyman afford to raise heifers for sale?

### Average Cost of Raising Heifers

The average cost of raising dairy heifers as determined in this study was \$110 per head for the year ending April 1, 1930, and \$81 per head for the year ending April 1, 1931. The various items making up the cost are shown in Table 1, and explanation of the items and of the methods used in determining them is given on pages 9 - 11.

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### ACKNOWLEDGMENTS

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As shown in Table 1, the average cost of production in each year was considerably higher than the average market value of the heifers, which was \$86 per head for the first year, and \$72 per head for the second year of the study. It should be kept in mind, however, that as explained in detail on pages 9 - 11, the cost of production includes 5 percent interest on the entire capital investment involved in raising the heifers, and prevailing wages for all work of the dairyman and his family in caring for them. Also, as explained later in this discussion, less than half of the cost is immediate cash expense.

Table 1  
SUMMARY OF COST OF RAISING A DAIRY HEIFER IN OREGON  
2 years ending April 1, 1931

1,063 farm records - 10,806 annual heifer records - 3,684 heifers freshened

Items	Cost per Heifer Freshened*		Average Percent of Total Cost
	Year Ending Apr. 1, 1930	Year Ending Apr. 1, 1931	
Number of farms	549	514	
Number of heifers per farm	10	11	
Heifers freshened per farm	3	4	
Birth value of calf	\$ 10	\$ 8	9%
Whole milk	\$11	\$10	11%
Skim milk	4	4	4
Grain	5	3	4
Dry roughage	23	14	18
Succulents	3	2	3
Pasture	12	12	12
<b>TOTAL FEED COST</b>	<b>\$ 58</b>	<b>\$ 45</b>	<b>52%</b>
Labor	7	6	7
Use of buildings	4	4	4
Sire cost	3	3	3
Interest on value of stock (5%)	5	4	5
Miscellaneous	3	2	2
<b>TOTAL DIRECT COST</b>	<b>\$ 90</b>	<b>\$ 72</b>	<b>82%</b>
INDIRECT COST: Loss on heifers that died or were sold	24	13	18
Total gross cost	\$114	\$ 85	100%
Credit for manure	4	4	4
<b>NET COST PER HEIFER FRESHENED*</b>	<b>\$110</b>	<b>\$ 81</b>	<b>96%</b>
Market value of heifers freshened	\$ 86	\$ 72	81%

\*Average age of freshening: 25 months.  
For explanation of cost items see pages 9 - 11.

Furthermore, the fact that the cost of raising heifers is greater than their market value does not necessarily mean that the dairyman should cease to raise his replacements. Other factors must be considered, particularly the danger of introducing disease into the herd, and the difficulty of building up the production of the herd when replacements are purchased. The high cost of raising them, however, does emphasize the importance of studying means of reducing it, and of raising the kind of heifers that will be worth the high cost.

## Death Loss and Culling Increases Cost

It was seen in Table 1, that a large item in the cost of raising heifers was loss on heifers that died or were sold.

A total of 223 head of heifers and heifer calves died during the year ending April 1, 1931, on the 514 farms in the survey. The causes given for these deaths are shown in Table 2. This covers only the death loss among the heifers that were being raised, not including calves that died at birth or within a few days.

Table 2.  
CAUSES GIVEN BY THE DAIRYMEN FOR DEATHS OF HEIFERS  
Year ending April 1, 1931

Cause of Death	Number of Deaths			
	Willamette Valley	Coast Region	Irrigated Region	All Regions
Accidents: drowning, etc.	19	24	13	56
Scours, colic, indigestion, etc.	27	13	13	53
Bloat	6	1	11	18
Poisoning	11	1	5	17
Calving	4	2	5	11
Pneumonia	1	1	9	11
Blackleg	0	0	10	10
Other causes	9	4	4	17
Causes unknown	15	9	6	30
Totals	92	55	76	223

A total of 699 head were sold for an average price of \$32 per head. It was not possible in this study to obtain data as to the ages at which these heifers were sold, nor as to costs of raising heifers to various ages. The heifers sold, however, would doubtless average about half grown; and it is apparent that the average selling price of \$32 represents considerable loss from half of the average cost of raising as shown in Table 1, which would be \$40.50 per head. Furthermore, the cost for the first half of the period of raising is undoubtedly greater than for the second half, which would make the loss on the heifers sold considerably greater than as just computed.

The large amount of this item suggests that many dairymen should be able to reduce their cost of raising heifers by more careful culling of heifer calves at birth, raising only the best calves from the best cows.

### Cost of Raising Heifers from High-Producing Cows

That it costs very little more to raise heifers from high producing cows than from low producers is shown by the graph on the cover page. In this tabulation the records for the 514 farms were divided into three groups according to the production of butterfat of the cow herd. The cost of raising was only \$6 more for the heifers from cows producing over 350 pounds of butterfat than for those from cows giving less than 250 pounds.

The slightly higher cost for the better herds is due to a little higher birth value of the calves and a little heavier feeding of milk and grain. The extra producing value of the heifers from the better herds, however, should be worth several times the extra cost.

This tabulation further emphasizes that it pays to raise only the best heifers from the best cows.

### Amounts of Feed Consumed by Heifers

In Table 3 is shown the average number of pounds of the several kinds of feed that were consumed by the heifers in different parts of the state.

Table 3  
AMOUNTS OF FEED REQUIRED TO RAISE A DAIRY HEIFER\*  
Average of 2 years ending April 1, 1931

Kind of Feed	Willamette Valley	Coast Region	Irrigated Region	All Regions
Whole milk (lbs.)	458	822	368	525
Skim milk "	1090	575	1942	1213
Grain "	403	186	69	253
Dry roughage "	3068	2192	4796	3330
Succulents "	1875	570	318	1098
Pasture (days)	290	477	336	350

\*Amounts required during 25 months for heifers freshened, not including the additional amount required for heifers that died or were sold.

The most whole milk is fed in the coast regions where most of the product is sold as whole milk to cheese factories. The most skim milk is fed in the irrigated regions where most of the product is sold as cream, leaving the skim milk on the farm. The Willamette Valley, with a mixture of whole milk and cream production, is between the other two regions in milk feeding practice.

The coast regions show the greatest use of pasture, and the irrigated regions the heaviest feeding of hay. The Willamette Valley, with less pasture than either, and poorer quality hay than the irrigated regions, feeds more grain and succulent feeds.

There was little difference in the total cost for feed under the three sets of conditions. The advantage of more pasture in the coast regions was largely offset by the larger amount of whole milk fed; and in the irrigated regions the better quality and lower price of the hay was offset by the larger quantity used, which possibly was due to wasteful methods of feeding.

### Skim Milk Reduces Cost

There are two general methods of raising calves: namely, raising them on whole milk only, and raising them on skim milk after the first few weeks. Whole milk is the most costly part of the feed required for raising calves. It was shown in Table 1 that the value of whole milk averaged \$10 per calf for the year ending April 1, 1931. The average price of the milk was \$1.78 per hundred pounds.

Table 4 shows that the dairymen who fed skim milk, excepting those who fed excessive amounts, had a feed cost about \$10 less per heifer than those with no skim milk. It is interesting to note that a minimum of around 300 pounds of whole milk apparently was necessary no matter how much skim milk was fed, and also that the amount of feed other than milk did not decrease with heavier feeding of skim milk. As a result the group of farms feeding the most skim milk show a higher total feed cost per heifer than those with no skim milk.

Table 4  
FEEDING SKIM MILK--BUT NOT TOO MUCH--REDUCES THE COST OF RAISING HEIFERS  
Year ending April 1, 1931

Items	Pounds Skim Milk Fed Per Calf				
	None	Under 1000	1000-2000	2000-3000	Over 3000
Number of farms	248	51	90	59	66
Lbs. skim milk per calf	-	659	1520	2403	4424
Lbs. whole milk per calf	913	324	316	280	417
	Cost per Heifer Freshening				
Skim milk	\$ -	\$ 2	\$ 4	\$ 7	\$ 13
Whole milk	17	6	5	5	6
Total milk	\$ 17	\$ 8	\$ 9	\$ 12	\$ 19
Other feed	33	32	29	29	32
<b>TOTAL FEED</b>	<b>\$ 50</b>	<b>\$ 40</b>	<b>\$ 38</b>	<b>\$ 41</b>	<b>\$ 51</b>

Experiments conducted by the Dairy Husbandry Department show that when skim milk is not available the cost of raising calves can be reduced considerably by the use of dry calf meal.\* These experiments indicate that calves can be raised successfully with even less whole milk than that shown in Table 4 for the farms that fed skim milk. It is also apparent that where skim milk has any value for purposes other than calf raising, the cost of raising heifers may be decreased by more judicious use of the skim milk fed.

#### Pasture Reduces Cost

Pasture is usually the cheapest form of feed for dairy cattle, and consequently, other things being equal, the more pasture, the lower the cost of production.

Table 5 shows that for the farms with little pasture both the feed cost and labor cost were higher. This was offset to some extent by a larger credit for manure, as a result of more barn feeding.

There were, however, only 41 farms, 8 percent of the total number, in the group with less than 60 days of pasture. There is much less shortage of pasture for young stock than for milking cows, since calves can be pastured in yards, orchards, and corners here and there, and older heifers can be kept in pastures that are too far away for the milking herd.

\* See Oregon Agricultural Experiment Station Bulletin No. 290, "Raising Calves on Dry Calf Meals", by I. R. Jones, P. M. Brandt, and F. D. Wilson.

Table 5  
LACK OF PASTURE INCREASES THE COST OF RAISING HEIFERS  
Year ending April 1, 1931

Items	Days of Pasture per Head Annually		
	Under 60	60 - 180	Over 180
Number of farms	41	261	212
Ave. no. days pasture annually	24	133	236
Total days pasture per heifer	50	277	492
	Cost per Heifer Freshening		
All milk	\$15	\$13	\$14
Pasture	2	9	16
Other feed	34	23	15
Labor	10	6	4
Total feed and labor	\$61	\$51	\$49
Less credit for manure	7	4	3
Net Total	\$54	\$47	\$46

Larger Herds are More Efficient

Table 6 shows that the farms with larger herds of young stock had considerably lower costs per head for labor, buildings, and sire expense. Reasons for this are that it takes nearly as long to perform many labor operations for a small herd as for a large one; the additional building space needed for a larger herd is not in proportion to the additional number of stock; and the cost of keeping a bull is often just as much for a small as for a large herd.

Table 6  
RELATION OF NUMBER OF HEIFERS PER FARM TO LABOR, BUILDING AND SIRE COST  
Year ending April 1, 1931

Items	Number of Head per Farm		
	Under 5	5 - 25	Over 25
Number of farms	104	381	29
Ave. No. head per farm	3	11	40
Heifers freshened per farm	1.5	6	15
	Cost per Heifer Freshening		
Labor	\$11	\$ 6	\$ 4
Use of buildings	7	4	2
Sire	4	3	2
Total	\$22	\$13	\$ 8

There was some indication that the loss by death and culling was higher for the larger herds, but the data are not sufficient to warrant such a conclusion at this time.

Only Part of the Cost is Cash Expense

As was mentioned before, less than half of the cost of raising heifers is immediate cash expense. Such items as the labor of the dairyman and members of his family, depreciation of buildings, and interest on the capital investment are not paid out in cash, although, of course, they have a value and should be charged as part of the cost of production.

Table 7  
CASH AND NON-CASH COSTS OF RAISING A DAIRY HEIFER  
Year ending April 1, 1931  
514 farms - 5497 annual heifer records - 2059 heifers freshened

Items	Total Cost	Cash	Non- Cash
Birth value of calf	\$ 8	\$ -	\$ 8
Purchased feed	7	7	-
Home-grown feed	38	19	19
Labor	6	1	5
Use of buildings	4	1	3
Sire cost	3	1	2
Interest on value of stock	4	-	4
Miscellaneous	2	2	-
<b>Total direct cost</b>	<b>\$72</b>	<b>\$31</b>	<b>\$41</b>
Loss by death and sales	13	-	13
<b>Total gross cost</b>	<b>\$85</b>	<b>\$31</b>	<b>\$54</b>
Credit for manure	4	-	4
<b>NET COST PER HEIFER FRESHENED</b>	<b>\$81</b>	<b>\$31</b>	<b>\$50</b>
Percent of total cost	100%	38%	62%

In Table 7 is shown the amount of the various cost items that was incurred as direct cash expenditure. Cost studies of feed crops have shown that about half of their cost is non-cash and hence the home-grown feed has been entered as half cash and half non-cash. The other cash items cover hired labor, cash expense for upkeep of buildings, the cash items necessary for maintenance of the sire, and miscellaneous cash items such as taxes, registry fees, and testing expense. The part of the loss by death and sales that was cash expense was covered by cash received for stock sold and hence this item is entered as entirely non-cash.

It should be realized, however, that much of the non-cash cost indirectly represents cash expenditure. Depreciation must be met sooner or later by cash expenditure for replacements. Even part of the interest, on many farms, is actual cash expenditure in the form of interest on borrowed money.

## Wide Variation in Cost on Different Farms

Table 3 shows that 23 percent of the farms had costs of less than \$50 per heifer, while 13 percent had costs of over \$150 per heifer.

Table 3  
VARIATION IN COST OF RAISING DAIRY HEIFERS  
Year ending April 1, 1931

Total Cost per Heifer Freshened	Percentage of Farms
Under \$50	23%
\$ 50 - \$100	45%
\$100 - \$150	19%
Over \$150	13%

Determining the factors that account for this wide variation in cost between different farms, and what an individual dairyman can do to change these factors so as to reduce his costs of raising heifers are the major objects of this phase of the Dairy Cost Study. Several factors that account for part of the variation have been discussed in this report. As the study is completed and full analysis is made of the data, it is anticipated that additional conclusions will be reached as to effective ways of reducing the cost.

### Explanation of Cost Items

The study is being carried on by the survey method in the 22 counties leading in dairy production in Oregon. With the assistance of county agents and others familiar with local conditions in each county an impartial selection was made of representative dairymen with six or more cows; excluding, however, dairymen who are primarily breeders or distributors of fluid milk.

The cost data were obtained from these dairymen in personal interviews by representatives of the Oregon Agricultural Experiment Station. The figures obtained are based largely on careful detailed estimates made by the dairymen, but books and records are used whenever available.

This report covers only the young heifers and heifer calves that were being raised for dairy purposes, for the period from birth to freshening for the first time, which was at the average age of 25 months.

Average Number of Heifers in Herd. The number of heifers is based on the total number of months that each heifer or heifer calf being raised for dairy purposes was in the herd during the year. The average number was obtained by dividing by 12 the total number of months for all such heifers in the herd at any time during the year.

Valuation of Heifers. The values used for the heifers at the beginning and end of the year, and for calves born and heifers that freshened, were prevailing market prices in the community for stock of similar quality. For heifers bought or sold the purchase or sale prices were used.

There was an average decrease in value from the beginning to the end of the year of \$4 per head for the first year, and \$7 per head for the second year. This decrease in inventory value has not been included as part of the cost of raising heifers, since over a period of years increases in value will offset the decreases. Each tabulation has been corrected for this decrease in value by adding to the end of the year inventory the amount of the decrease in value for the average number of heifers kept during the year.

Basis of Cost Charges per Heifer Freshened. An important part of the cost of raising dairy cows is the loss by death, and by culling out and selling of heifers that fail to develop satisfactorily. In order to show this part of the cost separately, and also in order to show amounts of the various items directly required for an individual heifer, the following basis of pro-rating the various cost items has been used in computing the total cost of raising a heifer to the time of first freshening, which averaged 25 months of age.

The charges for the birth value of the calf and for milk are the average costs per calf for all calves born or purchased. All other items are the average cost per head of heifers and heifer calves being raised for dairy purposes, for a period of 25 months. This was computed for each year by multiplying the average cost per head per month of that year by 25.

It is assumed, then, that the amount of the various items over and above the part required for the heifers that freshened, determined as just explained, is the part that was required for heifers that died, were sold, or were added as increase to the heifer herd. From this amount is subtracted the value of the heifers sold, and the increased value of the inventory at the end of the year over the value at the beginning plus the value of stock bought. The difference is the item shown as "loss on heifers that died or were sold."

Whole Milk. Charged at the price that the dairyman could have obtained for it on the farm, which averaged \$2.24 per hundred pounds for the first year, and \$1.78 for the second.

Skim Milk. Charged at a uniform rate of 35 cents per hundred pounds for the first year, and 30 cents for the second year.

Grain. Grain, including calf meal, oil meal, etc., is charged at actual cost including hauling. Grain raised is charged at sale value on the farm. If chopped or ground the prevailing commercial rate for chopping or grinding is included in the value of the feed.

Dry Roughage. Hay raised is charged at sale value in the barn. Hay purchased is charged at actual cost including hauling. For farms that fed waste hay from the cows the value was reduced in proportion to the inferior quality.

Succulents. Except in the very few cases of sales of succulent feeds, in which the actual sale value was used, all silage, roots, kale, and other green feed are charged at \$5 per ton for the first year and \$4 per ton for the second.

Pasture. Valued at actual cost, if rented, and at prevailing rates per head per month for pasture of similar quality, of owned.

Labor. Includes all labor used in feeding and caring for heifers and heifer calves being raised for dairy purposes. Includes the work of the operator of the dairy, members of the family, and hired labor, all valued at prevailing wages for similar work and including the value of board, if furnished.

Use of buildings. The proportion that was estimated to be chargeable to the heifers of the interest, depreciation, and repairs on buildings used for them. Interest is computed at 5%; depreciation is based on the value and estimated life of the building.

Sire Cost. The cost of maintaining the herd sire was computed separately and is pro-rated to the cows bred and heifers bred during the year. Breeding fees paid are also included in this item.

Interest on Value of Heifers. Five percent interest on the average of the value of the heifer herd at the beginning and at the end of the year.

Miscellaneous. A number of smaller items are included under this heading of which the most important are taxes, veterinary expense, registry fees, bedding, salt, and insurance.

Loss on Heifers That Died or Were Sold. See explanations above under "Basis of Cost Charges per Heifer Freshening."

Credit for Manure. A separate estimate was not obtained of the credit for manure saved from the heifer herd. It has been estimated therefore from the manure credit for the cow herd on a basis of the amounts of barn feed consumed by the cows and by the heifers. Manure dropped in pastures is not credited because the charge for pasture is a net amount in addition to the manure left in the pasture. The credit for manure per heifer freshened has been computed in the same way as the cost items per heifer freshened as explained above, the difference over and above the credit for the heifers that freshened being deducted from the item "loss on heifers that died or were sold."