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*Cattle
Cost of
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NORTH OF SCOTLAND COLLEGE OF AGRICULTURE

AGRICULTURAL ECONOMICS DEPARTMENT

Miscellaneous Report No. 4

COST OF CALF REARING 1947-48.

PILOT INVESTIGATION

by

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PILOT SURVEY INTO THE
COST OF CALF REARING 1947 - 48.

To determine a method of costing calf-rearing, a pilot survey was carried out during 1947-48, prior to a fuller investigation next year. The calculation of the cost of calf-breeding and rearing involves many factors, which vary with the system employed. In this investigation, the calves were mainly reared to be sold as store animals and suckled the cows until weaned. Any attempt to determine the amount of milk consumed per calf was impossible and unnecessary, since the cows were kept solely to produce calves, and so the cost of keeping them must be charged to the calves. This was done for a winter and summer period, and a total cost for the year of the cows obtained. A cost per reared calf could then be found.

Records were kept throughout the winter of 1947-48 up to the date the cows were put to grass and thereafter for the summer grazing period. At the commencement and end of the costing year, the cows were three or four months in calf, so that the total yearly cost per cow could be correctly charged.

Winter Period

The records were begun during November and December on five farms involving 81 cows. On four farms, these were mainly cross-bred animals of the recognised beef breeds, but on one farm the main enterprise was the production of attested heifer calves, where the cows used were Ayrshires and Ayrshire crosses.

The value of the home grown food consumed has been taken at cost of production as determined by the 1947 crop report issued by this Department.

The figures used are given below:-

Turnips	24/6 ton	Silage - arable	50/7 ton
Hay	113/6 ton	Oats	10/11 cwt.
Straw	39/7 ton	Barley	12/10 cwt.
Beet-tops	8/3 ton		

The manhour cost was calculated from the actual wages paid to the cattlemen, and ranged from $1/8\frac{1}{2}$ to $2/2$ per hour. Table I shows the average cost of keeping a cow per week throughout the winter on each farm.

TABLE I Cost of Keeping a Cow per Week - Winter

	Farm 1	Farm 2	Farm 3	Farm 4	Farm 5
Turnips	9/4	1/3	5/4	5/11	2/5
Straw - total	3/9	1/6	2/7	6/1	1/8
Hay	-	1/11	-	-	1/1
Oats	-	1/4	1/2	-	4/-
Other Foods	-	1/6	-	-/3	3/4
Total Home Grown Foods	13/1	7/6	9/1	12/3	12/6
<u>Add</u> Purchased Foods	-	-	-	-	-/1
Total Foods	13/1	7/6	9/1	12/3	12/7
<u>Add</u> Man Labour	3/11	1/9	2/1	4/2	2/-
Horse Labour	-	-/3	-	-	-
Miscellaneous	-/1	-/1	-	-	-
Overhead Costs	1/-	-/7	-/6	1/-	-/6
Gross Cost	18/1	10/2	11/8	17/5	15/1
<u>Less</u> Residual Manurial Values	1/5	-/9	1/-	1/7	1/3
Net Cost Per Cow Per Week	16/8	9/5	10/8	15/10	13/10

It will be seen that Farm 2 has the lowest cost per cow per week. This difference is accounted for entirely in the cost of the food fed. The cows were grazing outside during the day, and were brought inside at night, and hence a charge for winter grazing was made - charged under Other Foods at 1/6. The amounts of turnips and straw used were therefore considerably reduced. The turnips were carted out to the field by horse and cart, which was charged at 1/3 per horse hour and 2/2 per man hour. Other Foods fed included Sugar-Beet tops on Farm 4, and arable silage and a small amount of Barley on Farm 5. On the farm where the cost per week was the highest of the sample, the greatest quantity of turnips per cow was fed. This will be seen more clearly in the following table of quantities of food fed per cow per week.

TABLE II Quantities of Food Fed per Cow - per week - hundredweights.

	Farm 1	Farm 2	Farm 3	Farm 4	Farm 5
	cwts.	cwts.	cwts.	cwts.	cwts.
Turnips	7.63	1.02	4.36	4.87	2.01
Straw - total	1.91	.77	1.31	3.06	.85
Hay	-	.34	-	-	.19
Oats	-	.12	.11	-	.37
Other Foods	-	Grazing	-	.51	1.29

Farm 5, apart from the farm where winter grazing was utilised, used the least quantity of food per cow, while employing the greatest variety. The cost will be seen to be about average for the sample, - Table I. Farm 1 feeding Turnips and Straw only, used the greatest quantity of food per cow and had the highest cost.

TABLE III Hours Expended per Cow per Week

	Farm 1	Farm 2	Farm 3	Farm 4	Farm 5
Man Hours	2.22	.84	1.04	1.91	1.19
Horse Hours	-	.16	-	-	-

As expected, Farm 2 where grazing was utilised, showed the least number of man hours expended per cow per week. As can be seen from Tables II & III there is a direct, and obvious, relationship between the quantity of turnips and "large bulking" foods fed, and man-hours expended per cow.

The average length of the winter period was 24 weeks per cow. Individual farm figures are given below, together with the total cost per cow for the period.

TABLE IV Total Cost per Cow for Winter Period

	Farm 1	Farm 2	Farm 3	Farm 4	Farm 5
Average Number of weeks per cow	25	22½	23	25	25
Total Cost per Cow for Period	£20.16.8	£10.11.10	£12.5.4	£19.15.10	£17. 5.10

On Farm 2 the earliest opportunity was taken to leave the cattle out all day on the grass, and so the net cost per cow for the period was very low.

Summer Period

Five farms - totalling 75 cows - were again costed during the summer, but, unfortunately, Farm 5 was unable to continue keeping records, and so another farm was included for this period only. With the exception of Farm 2, the cows on all the farms were turned out to grass at the beginning of May.

The summer cost of the cows necessitated the keeping of grazing records of all stock on the farm. The number of grazing days for each type of animal was found, and converted to a common unit by the use of a Livestock Unit Table shown overleaf.

Livestock Unit Table

1 Working Horse	=	1 unit
1 Young Horse	=	$\frac{1}{2}$ unit
1 Cow or Bull	=	1 unit
1 Young Stock	=	$\frac{1}{2}$ unit
1 Store or Feeding Cattle	=	1 unit
7 Breeding Sheep	=	1 unit
14 Other Sheep	=	1 unit

In calculating the grazing cost on the individual farm, each field grazed was dealt with separately to ensure an accurate "carry forward" for residual manurial values. The average grazing cost structure per acre, for the farms, is given below to indicate the factors involved.

Average Grazing Cost per Acre

	£. s. d.
Proportion of laying-down charge	-.17. 4
Rent	-.18. 1
Overhead Costs	-. 9. -
Cleaning Costs	-. 7. 9
Manurial Residues b/f	<u>2.15. 7</u>
Gross Cost	5. 7. 9
<u>Less</u> Manurial Residues c/f	1.12.10
Hay - $\frac{2}{3}$ of cost remvd.	<u>-. 8. 7 2. 1. 5</u>
Net Cost Per Acre	<u>£3. 6. 4</u>

Where Hay had been cut, some cost had also to go to it, and this was taken at two-thirds of the cost-to-date, i.e. two-thirds of the gross cost less Manurial Residues carried forward. No allowance has been made in respect of a residual manurial value for the dung of the grazing animal.

The type of grazing varied considerably. Farms 1, 4, 6 used rotation leas of one, two, and three years old grass; Farm 2 grazed a three year old grass field and seven hundred acres of "black hill"; while Farm 3 used two fields of six and seven-year old grass.

The grazing cost per farm and per Livestock unit was calculated, and hence that amount chargeable to the cows only. The cost of man-labour expended during the period, and a charge for overhead costs were added.

The following table details these costs:-

TABLE V Cost of Keeping a Cow per Week - Summer

	Farm 1	Farm 2	Farm 3	Farm 4	Farm 6
Grazing Cost	6/3	3/7	1/8½	4/3	3/11
Labour - Man	-/3	-/5	-/2	-/11	-/9
Miscellaneous	-	-	-	-	-/1
Overhead Costs	-/1	-/1	-/0½	-/3	-/2
Net Cost per Cow per Week	6/7	4/1	1/11	5/5	4/11

The lowest cost of 1/11 per cow per week, occurred on Farm 3 where the grazing cost, calculated on six and seven year old grass was extremely low. This is due to the fact that manurial residues brought forward from previous years become progressively smaller as the age of the grass increased. On Farms 4 and 6 an hour a day was spent in looking round the cows, and hence there was a larger cost per week for man-labour on these farms.

The average grazing period per cow was 22½ weeks, and individual farm figures are given below, with the cost per cow for the summer.

TABLE VI Cost per Cow for Summer Period

	Farm 1	Farm 2	Farm 3	Farm 4	Farm 6
Average grazing Period per Cow	26	21	24	21	20
Cost per Cow for Summer	£8.11. 2	£4. 5. 9	£2. 6. -	£5.13. 9	£4.18. 4

Rearing Cost of Calves

The foregoing has illustrated the calculation of the yearly cost of keeping one cow, and since the cows are kept solely for the production of calves, determination of the net cost per calf reared is now possible.

Details of calf movements are summarised below:-

Number born	60	
Number bought	<u>29</u>	89
Number died	7	
Number sold	<u>3</u>	<u>10</u>
Total - reared		<u>79</u>

The figures above do not include those two farms (5 and 6) which were costed for only the winter or summer, and they have not been included in any of the succeeding figures, as it is felt that the result would be misleading. The majority of the cows calved in March and April, as can be seen in the analysis of calving dates.

<u>1947</u>		<u>1948</u>									
<u>Nov.</u>	<u>Dec.</u>	<u>Jan.</u>	<u>Feb.</u>	<u>Mar.</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug.</u>	<u>Sept.</u>	<u>Total</u>
1	2	-	10	27	13	2	2	2	-	1	<u>60</u>

A replacement or depreciation figure per cow has not been included since a) the breeding-life of these cows is long and b) the final price received when these cows are sold is relatively high. Any replacement charge would therefore be small.

The bull service charge, included in the following table was taken at 17/5 per cow, and was determined by dividing the cost of keeping the bull for a year by the number of cows served.

TABLE VII

Cost per Home-bred Calf Reared

Farm No.	No. of Cows	Total Winter Cost	Total Summer Cost	Service Charge	Total Cost	Less sale of suckling calves	Calves Sold	No. of Calves Born & Reared	Total Cost Charged to Calves	Cost per Home Bred Calf Reared
		£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.			£. s. d.	£. s. d.
1	20	424.13. 4	155. 3. 6	17. 8. 4	597. 5. 2	-	-	16	597. 5. 2	37. 6. 7
2	11	116.18. 9	44.11. 7	9.11. 7	171. 1.11	-	-	8	171. 1.11	21. 7. 9
3	17	206.10. 3	46. 3.10	14.16. 1	267.10. 2	13. -. -	2	16	254.10. 2	15.18. 1
4	11	215.15.11	68. 2. 6	9.11. 7	293.10. -	1. 4. -	1	10	292. 6. -	29. 4. 7

The net cost per calf shown above is for each calf born and reared on the farm up to the end of the summer grazing period. The price received for those suckling calves which were sold, was deducted from the total cost.

Farm 3, where the summer cost per cow was very low, had the lowest cost per calf.

On some farms, the cows suckled more than one calf, and so a number of suckling calves were bought in. This had the effect of reducing the net cost per calf reared, and is demonstrated in the following table.

TABLE VIII Cost per Calf - Reared

Farm No.	No. of Calves Born & Reared	No. of Calves Bought & Reared	Total Calves	Price of Bought Calves	Cost to calves brought from Table VII	Total Cost to Calves	Cost for Reared Calves
				£. s. d.	£. s. d.	£. s. d.	£. s. d.
1	16	17	33	136.10. -	597. 5. 2	733.15. 2	22. 4. 8
3	16	3	19	21. -. -	254.10. 2	275.10. 2	14.10. -
4	10	9	19	72. -. -	292. 6. -	364. 6. -	19. 3. 5

The average price paid for the bought calves was £7.18/- and it will be seen that this price has been added to the original total cost obtained from Table VII.

Tables VII and VIII show the two cost figures vital to the farmer engaged in rearing calves, - the cost of rearing home-bred calves only, and the cost of rearing both, bought and home-bred calves. To rear a single calf per cow, while the cost of production is so high, appears prohibitive for any system, but this may be overcome by rearing two or three calves per cow. Where a large number of calves were bought, the effect has been considerable; e.g. Farm 1, where seventeen calves bought in, reduced the net cost per calf by £15 - from £37. 6. 7 to £22. 4. 8. Although the sample of farms is so small, it does indicate the absolute necessity of making full use of the rearing capabilities of each cow. For the average commercial breeder, two or three calves per cow must be the aim, if such an enterprise is to be profitable.

While this investigation is too small to draw any definite conclusions, it has brought to light a number of questions of the utmost importance.

For example:-

- a) Can the number of calves be increased to three or four per cow, without any adverse effect on the cow?
- b) If so, will these calves so reared, have as good a start in life as the calf which alone suckles a cow?
- c) By this method of rearing three or four calves per cow, will the farmer, while lowering the cost per calf, also lower his profit per calf?

From Table VIII it will be seen that on Farm 3, the cost per reared calf was £14.10/-, due to a very low summer cost per cow. Only one calf per cow was reared on this farm, however, so may not this system bring the calves on quicker than by rearing more than one calf per cow?

In the investigation now being carried out, it is hoped that some of these questions will be answered.

ACKNOWLEDGEMENT

The Economics Department of the North of Scotland College of Agriculture is grateful to all farmers who assisted by keeping records and it is hoped that in the investigation now in progress a much larger sample will be obtained.

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