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*Cattle
Cost of
Production
O.S.*
SEPTEMBER, 1954

ECONOMICS OF LIVESTOCK PRODUCTION

REPORT ON BREEDING, REARING AND
FATTENING CATTLE, 1952-53

by

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RECENT PUBLICATIONS

FINANCIAL RESULTS OF EAST OF SCOTLAND FARMS:-

<u>GROUP</u>	<u>1947- 1948</u>	<u>1948- 1949</u>	<u>1949- 1950</u>	<u>1950- 1951</u>	<u>1951- 1952</u>	<u>1952- 1953</u>
	- - - - - No. of Farms - - - - -					
1. Hill Sheep Farms	48	54	52	53	57	58
2. Stock Rearing Farms						
3. Stock Raising and Feeding Farms	143	184	175	178	173	183
4. Arable Farms						
5. Dairy Farms						
	<u>191</u>	<u>238</u>	<u>227</u>	<u>231</u>	<u>230</u>	<u>241</u>

COSTS OF MILK PRODUCTION - 1947-48, 1948-49, 1949-50, 1950-51, 1951-52, 1952-53, 1953-54.

ECONOMICS OF LIVESTOCK PRODUCTION:-

(a) Winter Fattening of Sheep : 1947-48, 1948-49, 1949-50.
(b) Winter Fattening of Cattle : 1947-48, 1948-49, 1949-50.
(c) Commercial Egg Production : 1949-50, 1950-51, 1951-52.
(d) Cattle Rearing : 1951-52.

ENTERPRISE COSTS:- Economics of Silage Making in East of Scotland, 1950, 1951, 1952, 1953.

Wheat Costs - 1952 Crop.

Barley Costs - 1952 Crop.

DAIRY LABOUR IN THE EAST OF SCOTLAND.

ECONOMICS OF BRACKEN ERADICATION, 1951, 1952, 1953.

TEAM WORK IN GRASS SILAGE MAKING.

Inquiries regarding the above publications
should be addressed to either the Secretary of the College
or the Provincial Agricultural Economist.

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INTRODUCTION

This report, the second in the series, deals mainly with the cost of keeping a breeding herd and producing a weaned calf at approximately 6-8 months old. Although this was the primary object of the investigation some costs relating to rearing stores and feeding fat cattle were obtained and these results also are given in this report.

It is hoped that with greater emphasis now being placed on beef cattle and the need for production costs to be kept as low as possible this report will be of interest to many farmers, especially those who may have in mind a change from milk production to some other form of cattle enterprise.

II. GENERAL DESCRIPTION OF FARMS AND HERDS STUDIED

The twenty-four farms studied in this report were distributed throughout the area as follows; Angus 8, Fife 5, Roxburgh 3, Peebles 3, Berwick 3, East Lothian 1 and Selkirk 1.

There was a great variation in type and size of farms on which the herds were kept. The average size of farm was 795 acres, ranging from 3213 acres - a hill sheep farm - to 104 acres - a semi-upland stock-raising farm. Many of the farms, however, were low-ground arable farms of 300-400 acres situated on good fertile soil.

Rents showed a wide variation from 2s. 3d. per acre for a hill sheep farm to 40s. per acre for a low ground arable farm. The average rental per acre for the 24 farms studied was 20s. 3d.

There was also great variation between individual farms in the breed of cows kept. In the main, on the low-ground arable farms, the breeds kept were Shorthorns or Blue-Greys crossed with an Aberdeen-Angus bull. On the hill farms the hardier breeds - Highlanders, Galloways and their crosses were to be found and these were crossed with either a Shorthorn or Aberdeen-Angus bull.

III. COSTS OF PRODUCTION

A) BREEDING COWS

In the Table below the cost of keeping a breeding cow per annum is set out and compared with last year's figures.

TABLE I/

TABLE I. COST PER COW PER ANNUM 1951-52 AND 1952-53

YEAR	1951-52	1952-53
No. of Herds Studied	27	24
Average Farm Size	928 acres	795 acres
Average Herd Size	36	34
<u>COSTS</u>	£ s. d.	£ s. d.
<u>Foods</u>		
Purchased	-.12. 1	1. 4. -
Home-Grown	11. 6.11	13. -.11
Grazing	<u>5.14. 5</u>	<u>6.13. 1</u>
Total	17.13. 5	20.18. -
<u>Labour</u>		
Winter	1.17. -	1.18. -
Summer	<u>-. 8. 4</u>	<u>-. 9. 4</u>
Total	2. 5. 4	2. 7. 4
*Miscellaneous	1.15. 5	1.14. 3
Herd Maintenance	1.19.11	1.16. 2
TOTAL COSTS	£23.14. 1	£26.15. 9

* Includes overheads, vet expenses, haulage, etc.

The above table clearly shows that feeding costs are the most important item in keeping a cow for a year, accounting for three-quarters of the total cost in both years. The next largest item in the cost of production, labour, accounts for only 8 per cent of the total cost.

In a comparison of the two years 1951-52 and 1952-53 the table shows that there has been an increase of approximately £3 per cow in 1952-53 this being accounted for by the increased cost of foods. Labour costs show a slight increase over the two years, whereas miscellaneous and herd maintenance costs were slightly reduced.

Table II below sets out the cost of producing a weaned calf approximately 6-8 months old. The cost per weaned calf is slightly higher than the cost per cow per annum because of barren cows and deaths of calves.

TABLE II./

TABLE II. COST PER WEANED CALF (Approximately 6-8 Months Old)
1951-52 - 1952-53

YEAR	1951-52	1952-53
Average No. of Weaned Calves per Herd	35	34
Weaned Calves produced as percentage of Cows in Herd	97%	100%
<u>COSTS</u>	£ s. d.	£ s. d.
<u>Foods</u>		
Purchased	- .12. 10	1. 4. -
Home-Grown	11.12. 5	13. -.11
Grazing	5.15. 2	6.13. 1
Total	17.19. 7	20.18. -
<u>Labour</u>		
Winter	1.18. 7	1.18. -
Summer	-. 8. 7	-. 9. 4
Total	2. 7. 2	2. 7. 4
*Miscellaneous	1.17. 1	1.14. 3
Herd Maintenance	2. 1. 6	1.16. 2
Purchased Calves	-. 2. 3	-. 2. 8
TOTAL COSTS	£24. 7. 7	£26.18. 5

* Includes overheads, vet expenses, haulage, etc.

The above table is similar to Table I. except that in 1951-52 the cost per weaned calf produced was slightly higher than the cost per cow per annum. This is accounted for by the fact that for every 100 breeding cows only 97 weaned calves were produced. In 1952-53 each cow produced a calf which attained the weaned calf stage and both costs were similar apart from the incidence of purchased calves in one or two herds, which in both years made up a very small proportion of total costs when spread over the whole sample of herds studied.

As already stated there was a wide range in types of farms on which the herds studied were to be found, from low-ground arable farms to hill sheep farms. With this wide range in farm types there were naturally great differences in systems of management on individual farms. It is, however, possible to divide the herds studied into three broad groups according as to whether the breeding cows were inwintered or outwintered. These groups were as follows:-

- Inwintered herds, usually Shorthorns or Blue-Greys and mainly on low-ground arable farms.
- Outwintered - again Shorthorns or Blue-Greys receiving liberal rations and adequate shelter, mainly on low-ground arable farms or semi-upland stock rearing farms.
- Outwintered - usually of the hardier breeds - Highlanders, Galloways and their crosses outwintered on hill ground.

Table /

Table III. below sets out for each of the three groups the cost per cow per annum and cost per weaned calf produced.

TABLE III. COST PER COW PER ANNUM AND COST PER WEANED CALF PRODUCED FOR THREE GROUPS (a), (b) AND (c)

GROUP	(a)	(b)	(c)
No. of Herds	8	10	6
Average Farm Size	519	603	1051
Average Herd Size	37	37	26
Average No. of Calves Produced per 100 Cows	100	99.7	99.6
<u>COSTS</u>	£ s. d.	£ s. d.	£ s. d.
<u>Foods</u>			
Purchased	1.10. 7	-. 2.10	1. 5. 2
Home-Grown	17. 3.11	12. 1. 6	10. 8. -
Grazing	<u>7.16. 5</u>	<u>6.19.11</u>	<u>4.10. 5</u>
Total	26.10.11	19. 4. 3	16. 3. 7
<u>Labour</u>			
Winter	2. 7. 2	1.14. 5	1.11.10
Summer	<u>-.10. 4</u>	<u>-. 8. 4</u>	<u>-. 9. 9</u>
Total	2.17. 6	2. 2. 9	2. 1. 7
* Miscellaneous Herd Maintenance	1. 5. 3 -.12. 6	2. 7. 3 2.13. 1	2. 1. 7 1.19. 1
Cost per Cow per Annum	£31. 6. 2	£26. 7. 4	£22. 5.10
Purchased Calves	-. 6.10	-. 1. 1	-. -. -
Cost per Weaned Calf Produced	£31.13. -	£26. 8. 5	£22. 5.10

* Including overheads, vet expenses, haulage, etc.

The above table shows the cost of producing a calf under varying conditions. The most expensive calves to produce were, as one would expect, those from the in-wintered herds, whilst on the other hand calves from the hardier breeds outwintered on the hills were the cheapest.

In all groups feeding costs formed by far the largest single item of the total costs accounting for 84 per cent, 73 per cent and 73 per cent respectively of the cost of producing a weaned calf. It is, in fact, the feeding costs which account for the final difference in costs between the three groups. Labour costs are slightly higher for the inwintered herds but miscellaneous costs are lower than for the other two groups, the high miscellaneous costs in groups (b) and (c) being mainly due to the greater use of tractors in hauling food to the cows and to higher overheads. Herd maintenance /

maintenance costs were highest for the Group (c) herds, forming approximately 9 per cent of the total cost, and lowest for the inwintered herds - only 1 per cent of the cost of producing a weaned calf in this group.

RANGE IN COSTS PER WEANED CALF PRODUCED

Table IV. shows the distribution of costs for each of the groups.

TABLE IV. DISTRIBUTION OF COSTS

GROUP	Under £20	£20 - £25	£25 - £30	£30 - £35	Over £35	TOTAL
(a)	-	2	2	1	3	8
(b)	1	4	2	2	1	10
(c)	4	-	2	-	-	6
TOTAL	5	6	6	3	4	24

There was an extremely wide variation in individual costs from the lowest cost of £15. 6. 3d. per calf on a low ground arable farm where the cows were outwintered to the highest cost of £47. 6. 2d. per calf again on a low-ground arable farm where the cows were inwintered. In each group the individual results are fairly well grouped around the average with Group (b) showing the widest variation in individual costs.

B) REARING OF STORES 18-20 MONTHS

Table V. below sets out the average cost of production of a store beast (18-20 months) for the 11 farms from which costs were obtained.

TABLE V. COST OF PRODUCING STORE BEAST 18-20 MONTHS

No. of Farms	11
Average No. of Beasts Per Farm	38
<u>COSTS</u>	£ s. d.
<u>Foods</u>	
Purchased	1. 4. 6
Home-Grown	11. 18. 10
Grazing	<u>3. 16. 3</u>
Total	16. 19. 7
<u>Labour</u>	
Winter	1. 4. 11
Summer	<u>- . 5. 10</u>
Total	1. 10. 9
Miscellaneous	- . 12. 8
Cost of Rearing Calf (6-8 months) to Store (18-20 months)	- £19. 3. -
Initial Cost of Calf	- £26. 13. 2
Cost of Store	- £45. 16. 2

The above figures show that it costs approximately £19 to rear a calf from the weaned calf stage to the final store stage and that feeding stuffs account for almost 90 per cent of the cost. For the purposes of arriving at a figure for the production cost of a store beast the initial cost of the calf was taken at cost of production or purchase price which ever was applicable. On this basis the average cost of a store beast is approximately £46. It has already been shown, however, that the cost of production of a weaned calf varies with the system of management and as the final cost of a store beast depends on the initial cost of the calf, there will be great variation in the average cost of production of a store beast. The cost of a store beast 18-20 months for each of the three groups (a), (b) and (c) is shown below.

TABLE VI. COST OF STORE 18-20 MONTHS FOR GROUPS (a), (b) AND (c)

GROUP	(a)	(b)	(c)
	£ s. d.	£ s. d.	£ s. d.
Cost of Rearing	19. 3. -	19. 3. -	19. 3. -
Initial Cost of Calf	31.13. -	26. 8. 5	22. 5.10
Final Cost of Store	£50.16. -	£45.11. 5	£41. 8.10

The above table brings out the importance of the initial cost of the calf and shows how the average cost of production can vary from approximately £51 to £41.

C) FEEDING CATTLE

Table VII, below sets out the cost of producing a fat beast ready for grading. The table gives two sets of figures (i) for beasts fattened in courts and sold April/May and (ii) for some beasts not quite ready for grading after the court feeding but kept on grass and graded in August.

TABLE VII. COST OF COURT FEEDING AND GRASS FATTENING

	Cattle Graded Out of Courts	Cattle Graded Off Grass
No. of Farms	6	2
Average No. of Cattle Costed per Farm	10	10
<u>COSTS</u>	£ s. d.	£ s. d.
<u>Foods</u>		
Purchased	2. 1. 3	2. 7.11
Home-Grown	13.18. 9	10.17. 1
Grazing	- . -	6. - . 6
Total	16. - . -	19. 5. 6
<u>Labour</u>		
Winter	1.14. -	2. 6. 6
Summer	- . -	- .18. 7
Total	1.14. -	3. 5. 1
Miscellaneous	1. 2. 6	1.12. 9
Cost of Feeding	18.16. 6	24. 3. 4
Initial Cost of Store	53. 5. 6	54. - . -
Final Cost of Fat Beast	£72. 2. -	£78. 3. 4

From the above figures it is seen that it costs approximately £72 on average to produce a fat beast at 24 months. The cost, however, will vary greatly with the initial cost of the store beast for fattening which, for the above Table, was taken at cost of production or purchase price. The average cost of £72 shows an increase of approximately £2 compared with 1949-50.[≡] All items have increased except for purchased foods which decreased by approximately £1.

IV. RETURNS AND PROFITS

In this section of the report the returns and profits to the various types of cattle enterprises are discussed.

A) WEANED CALVES

The following table shows the returns and profits per calf for the average of the 24 farms studied and for each of the three groups (a), (b) and (c).

TABLE VIII. RETURNS AND PROFITS PER CALF

GROUP	Average All Herds	(a)	(b)	(c)
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Cost per Calf	26.18. 5	31.13. -	26. 8. 5	22. 5.10
Selling Price Per Calf	33.10.11	35.19. 6	34. 7. 9	26.18. 6
Profit Per Calf [≠]	£6.12. 6	£4. 6. 6	£7.19. 4	£4.12. 8

[≠] Excluding all subsidies.

On average there is a profit of over £6 on each calf sold. It would seem from the above figures that for the sample studied the most profitable herds were those in group (b) i.e. those produced by outwintered herds mainly on low-ground arable farms, which had a profit of almost £8 per calf. The profit per calf for groups (a) and (c) was just over £4.

B) STORE AND FEEDING CATTLE

Table IX below shows the returns and profits for store and fat cattle.

TABLE IX. RETURNS AND PROFITS PER BEAST

	Store Cattle (18-20 months)	Fat Cattle
	£ s. d.	£ s. d.
Cost per Beast	45.16. 2	72. 2. -
Selling Price per Beast	48. 3. 3	75.15. 2
Profit per Beast	£2. 7. 1	£3.13. 2

The /

The above table shows that on average there is a profit of just over £2 per store beast in the case of the herds studied during the year. On only five of the eleven farms included in the sample were the store beasts sold and the selling price ranged from £41.10. 1d. to £53. 8s. per beast. By retaining the store beasts and feeding for approximately another six months, then selling fat the profit per beast is increased by £1. 6s. to £3.13. 2d. as shown.

V. FEEDING OF CATTLE

This section of the report deals with the quantities of food fed for each type of beast.

A) BREEDING COWS

Table X below shows the quantities of the various foods fed per cow per annum for the two years 1951-52 and 1952-53.

TABLE X. FEEDING OF BREEDING COWS 1951-52 AND 1952-53
CWTS. PER COW PER ANNUM

YEAR	1951-52	1952-53
<u>FOODS</u>	<u>cwts.</u>	<u>cwts.</u>
<u>Concentrates</u>		
Purchased	.45	.9
Home-Grown	1.00	1.4
Total	1.45	2.3
<u>Bulk Foods</u>		
Roots	28.1	30.7
Hay	7.5	9.2
Straw	21.2	19.7
Silage	15.5	21.0
Green Fodder	1.4	3.6
Druff	.1	.3
Total	73.8	84.5
Grazing Costs per Cow	£5.14. 5d.	£6.13. 1d.

The main point brought out by the above table is the increased quantities of foods fed in 1952-53 compared with the previous year. Purchased foods, although not of great significance, have doubled over the two years. All the other feeding stuffs show increased quantities fed in 1952-53 except for straw, which shows a slight decrease in quantity fed per cow per annum over the two years.

The quantities of food fed per cow in each of the three groups (a), (b) and (c) are given below in Table XI.

TABLE XI. /

TABLE XI. FEEDING OF BREEDING COWS : GROUPS (a), (b) AND (c)
CWTS. PER ANNUM

GROUP	(a)	(b)	(c)
<u>FOODS</u>	<u>cwts.</u>	<u>cwts.</u>	<u>cwts.</u>
<u>Concentrates</u>			
Purchased	1.7	.1	.7
Home-Grown	1.4	1.7	.8
Total	3.1	1.8	1.5
<u>Bulk Foods</u>			
Roots	49.7	22.0	20.0
Hay	4.6	11.4	11.5
Straw	21.5	22.2	13.0
Silage	43.6	9.9	11.7
Green Fodder	7.0	3.0	-
Draff	.5	-	.7
Total	126.9	68.5	56.9
Grazing Costs per Cow	£7.16. 5d.	£6.19.11d.	£4.10. 5d.

The above figures show the differences in types and quantities of foods fed under the different systems of management. It is of interest to note the importance of silage in the feeding of the inwintered cows (Group (a)) and the relatively small quantity of hay fed. The cows in Groups (b) and (c) receive more than double the quantity of hay of those in Group (a) but very much less silage.

B) FEEDING OF STORE AND FATTENING CATTLE

The following table shows the quantities and kinds of foods fed to a store beast. These cattle would be brought inside approximately October-November after weaning (approximately 6-8 months old) and fed in courts until the end of April.

TABLE XII. /

TABLE XII. FEEDING OF STORE CATTLE
CWTS. PER STORE BEAST

	Cwts. per Store Beast
<u>FOODS</u>	<u>cwts.</u>
<u>Concentrates</u>	
Purchased	.71
Home-Grown	1.27
Total	1.98
<u>Bulk Foods</u>	
Roots	24.0
Hay	10.2
Straw	6.2
Silage	13.2
Green Fodder	-
Draff	-
Total	53.6
Grazing Costs	£3.16. 3d.

Slightly less than 2 cwts. of concentrates, mostly home-grown, were fed to each beast during the period in courts. The main rations consisted of roots, silage and hay and there were great individual differences in the quantities of each of these foods fed. In all cases hay was fed to the store beasts but roots and silage were used in many cases as alternatives. Where no roots were used, the quantity of silage fed was as high as 40 cwts. per beast.

Table XIII. below shows the quantities of foods fed to the feeding cattle. These beasts were put into the courts for feeding approximately in November and sold off fat at the end of April or beginning of May.

TABLE XIII. FEEDING OF FATTENING CATTLE
CWTS. PER BEAST

	Cwts. per Beast
<u>FOODS</u>	<u>cwts.</u>
<u>Concentrates</u>	
Purchased	1.37
Home-Grown	.41
Total	1.78
<u>Bulk Foods</u>	
Roots	52.5
Hay	5.8
Straw	22.3
Silage	28.0
Green Fodder	-
Draff	-
Total	108.6

The importance of roots for feeding cattle is shown by the above figures and on all farms roots were fed. Silage was the second most important fodder crop and on one farm as much as 78 cwts. of silage was fed per beast. Although on average 5.8 cwts. of hay was fed per beast, on only two of the six farms was hay used in the rations of the fattening stock.

S U M M A R Y

- 1) The samples consisted of 24 herds of suckling cows widely scattered over the college area. The average farm size was 795 acres rented at 20s. 3d. per acre. The average herd size was 34 breeding cows ranging from a herd of 13 to a herd of 124 cows. Included in the sample were hill herds of Highlanders, Galloways and their crosses and herds of Shorthorn and Blue-Grey crosses on low ground farms, almost all crossed with either Aberdeen-Angus or Shorthorn bulls.
 - 2) The average cost of producing a weaned calf for all the 24 herds studied was £26.18. 5d. but this showed great variation depending on the type of farm and system of management of the breeding herd. The figure quoted was about £2.10.10d. dearer than last year, due to higher food costs per breeding cow.
 - 3) The sample was divided into three groups according as to whether the cows were inwintered or outwintered and also according to type of farm. The average cost of producing a weaned calf was as follows:-

(a) Inwintered Herds	-	£31.13s.
(b) Outwintered on Low-Ground Farms	-	£26. 8s. 5d.
(c) Outwintered on Hill Farms	-	£22. 5s.10d.
 - 4) Individual costs showed an extremely wide range from as low as £15. 6. 3d. per calf to £47. 6 . 2d. per calf.
 - 5) The average cost of producing a store beast 18-20 months old was £45.16. 2d. and the cost of producing a beast ready for grading was £72. 2s. fattened in courts and £78. 3. 4d. fattened off grass at 2½ years. The cost of producing a fat beast showed an increase of approximately £2 compared with the 1949-50 costs.
 - 6) Tables giving figures for the types and quantities of foods fed to the breeding herds, stores and feeders are set out, and show that purchased concentrates are of little importance. Of the home-grown foods roots, hay, silage and straw were the main foods fed.
 - 7) A comparison of returns and profits shows the herds outwintered on low-ground farms to be the most profitable with an average profit of £7.19. 4d. per calf compared with £4. 6. 6d. and £4.12. 8d. per calf for groups (a) and (c) respectively.
 - 8) The sample of store cattle costed showed a profit of £2. 7. 1d. per beast and the graded cattle showed a profit of £3.13. 2d. per beast.
-

ACKNOWLEDGMENT

Grateful acknowledgment is made of the valuable help given by farmers taking part in this investigation, not only by keeping the necessary records and furnishing us with all the other information needed, but for their unfailing courtesy shown on the occasion of our visits. Each collaborating farmer receives a summary of his own costs set out alongside those of the average cost. This investigation is being continued and it is hoped that wherever possible those farmers who have so far participated in the investigation will maintain their interest therein and will continue to give their generous help.

A P P E N D I X

NOTES ON COSTING METHODS

Manual Labour

This was charged at hourly rates ruling on the farm, adjusted to include holidays: any overtime was charged at rates paid. Manual work done by the farmer was charged at the average hourly rate prevailing on the farm.

Horse Work. Charged at 1s. 6d. per hour.

Tractor Work. Charged at 4s. 6d. per hour for wheel tractors and 6s. 6d. per hour for track laying tractors.

Foods

Purchased Foods were charged at purchase price less a deduction for the manurial value of the foods fed.

Home-Grown Foods were charged at cost of production. The following were the charges per cwt. for the home-grown foods:-

Oats	17s. 0d.
Straw	3s. 1d.
Hay	8s. 9d.
Roots	2s. 6d.
Silage - Grass	1s. 11d.
- Arable	2s. 4d.
Green Oats	2s. 6d.

Grazing

The total grazing available on each farm was costed and proportioned between the various stock on the following basis:-

Stock Equivalent

Cow	1 Unit
Calf at Foot	1/3 "
Stirk	2/3 "
Ewes	1/6 "
Lambs at Foot	1/18 "
Lambs Weaned	1/9 "
Feeding Sheep	1/6 "
Horse	1 "

Overheads

These were charged at suitable rates agreed by the Scottish Conference of Agricultural Economists. No charge was made for interest on capital or for any managerial work undertaken by the farmer.