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THE PROFITABILITY OF YARD FATTENED CATTLE

by

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**DEPARTMENT OF AGRICULTURAL ECONOMICS**  
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OCTOBER, 1954.

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## I. INTRODUCTION

At the present moment the fattening of beef cattle is a subject of great interest to those connected with the farming industry. There is, of course, considerable doubt as to the trend prices will take in the future and those farmers about to purchase cattle for fattening in yards this winter are very much in the dark when trying to speculate on the likely result of such an undertaking. It is hoped, therefore, that this report reviewing the yard cattle industry during the past winter may be of some help to these farmers by throwing light on costs of feeding and different systems of management.

The enquiry was undertaken to study and compare the profitability of fattening cattle in yards and of keeping store cattle in yards to finish on grass the following summer. This report deals with the first part of the enquiry only - a study of the yard fattening of cattle. The second part will be completed in the late Autumn and another report will be issued incorporating the results from both parts of the enquiry. The value of the comparison between the two systems will be upset to a certain extent by the change in marketing. The yard fattened cattle were all sold to the Ministry of Food under the old regulations, whilst the majority of those finished off on grass will be sold under the new marketing scheme.

In order to offset the disadvantages that have been encountered in two previous cattle enquiries undertaken by this Department<sup>(1)</sup> it was decided to limit the sample to cattle purchased immediately previous to the commencement of the enquiry in the autumn of 1953. This obviated the necessity of placing a value on cattle that had been reared on the farm or purchased some time before, a factor which detracted considerably from the accuracy of the previous costs. Farmers are rarely able to forecast with any precision the market value of an animal.

However, in the majority of cases the weight of the store animal was still dependent on the judgement of the farmer and the weights of store cattle quoted in this report are of questionable accuracy.

The enquiry included information from 21 farmers covering 22 herds of cattle (one farmer supplying information on two herds) and in all the sample contained 396 cattle. The farms were all situated in Lincolnshire. It is hoped that a similar number of farmers will complete the second part of the enquiry on cattle finished on grass, and these will be mainly from Leicestershire.

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(1) Richardson P. P. and Jones R. B. The Fattening of Cattle on Grass: A Study of Management, Costs and Returns (Interim Report). Published September 1952. Farmers' Report No. 114. University of Nottingham School of Agriculture, Department of Agricultural Economics, Sutton Bonington.

Richardson P. P. The Fattening of Cattle on Grass: A Study of Management, Costs and Returns (Final Report). Published October 1953. Farmers' Report No. 123. University of Nottingham School of Agriculture, Department of Agricultural Economics, Sutton Bonington.

Standard prices were fixed for all feeding stuffs and these are listed in Appendix II. It was decided to use market values for all saleable crops; cereals, potatoes, mangolds, etc., and a standard value was obtained by taking an average of the market prices between December 1st. and March 31st, the period which covered most of the time the cattle were in yards. The method of using market values was adopted in order to obtain some idea of the amount of income that the farmer had given up by feeding the crops to the cattle, although it is doubtful whether he would have been able to sell many of the crops, the market for cereals being very slow during the 1953-54 season. However, the crops were also re-calculated at cost of production and a comparison of the two methods can be seen on page 16. Where the cattle were grazed out in the Autumn prior to being turned into yards a charge was made of 8d. per head per day, a figure obtained from the enquiry into grass fattened cattle in 1952 already mentioned.

The author wishes to acknowledge with gratitude the co-operation of the farmers who have helped in this enquiry.

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It should be noted in reading this report that although every herd incurred a loss the terms "five most profitable" and "five least profitable" are used in accordance with the practice followed in previous reports and thus cover the results of the five herds showing the smallest losses and the highest losses respectively.

II. TYPE OF FARM

The cattle included in the sample were all fattened on arable farms in Lincolnshire where they were kept for the double purpose of providing manure for the land and utilising some of the by-products of the farm. The figures in Table 1 show the average size of these farms to be 304 acres, although they ranged from 20 to 1,400 acres.

LAND UTILISATION AND LIVESTOCK CARRY ON FARMS IN SAMPLE

Item	Per farm and per 100 acres	
	Per farm acres	Per 100 acres acres
Crops:-		
Wheat	66	22
Barley	41	13
Oats	21	7
Sugar beet	21	7
Potatoes	44	15
Market garden crops	1	-
Other crops(1)	51	17
Permanent grass	35	11
Temporary grass	24	8
Total acreage	304	100
Beef cattle:-	Nos.	Nos.
Cows and bulls	2	1
Other cattle over 2 years	39	13
Other cattle under 2 years	4	1
Dairy cattle	1	-
Sheep	107	35

(1) Mixed corn, fodder root crops, peas for harvesting dry, etc.

On average over 50 per cent of the acreage of these farms was devoted to cash crops; 35 per cent being under wheat and barley, and 22 per cent under potatoes and sugar beet. As already stated the farmers did not have breeding herds to rear their own stores and the cattle on the farms consisted almost entirely of stores over two years of age, there being on average 13 per 100 acres. On some farms the complete herd of cattle was not in the enquiry, one yard or lot of cattle being picked out for study. Sheep were also of some importance on these farms and there was an average of 35 sheep per 100 acres.

### III. AVERAGE COSTS AND RETURNS

A summary of the results of the enquiry is set out in Table 2. On paper, anyway, it appears that the farmers in the sample were fattening yard cattle at a considerable loss, the average result being a deficit of over £13 per beast, and in fact, all 22 records showed a loss. The farmers paid £70 per head for the stores in the Autumn, and during the Winter added £23 to the value of these animals. Against this income there were expenses of nearly £37 per beast, consisting mainly of feeding stuffs which accounted for more than £28. The cost of labour was over £4.10s. 0d. per beast.

When looking at the high losses shown in the table, two things should be remembered. Firstly, that home grown feeding stuffs were valued at market prices which in some cases, may put the value too high. Secondly, no credit has been made for the farmyard manure produced. A discussion of these problems and a reconsideration of feeding stuffs calculated at cost of production will be seen in Section VII page 16. By calculating feeding stuffs at cost of production and including a credit for manure, the average loss can be reduced to £2. 1s. 4d. and 11 of the herds made to show a profit instead of a loss.

An examination of the results for the five best herds and five least profitable herds shows that the average cost of store cattle and the price received for fat animals appeared to vary little with profitability. The difference in net margin was mainly due to the difference in the cost of feeding stuffs. The low profit herds had a bill for feeding stuffs as high as £4.12s. 2d. per beast, more than twice the amount for the more profitable herds.

From these results it would appear that the over-riding factor determining the profitability of yard fattening is the cost of feeding stuffs. There was very definite evidence that as the cost of feeding an animal increased the net margin or profit decreased. (1) The low profit herds were being fed more intensively and for a longer period than the most profitable herds. It is in the feeding of the animals that skilled management is necessary, although the ability to buy a good store cheaply is, of course, also of great importance.

In previous enquiries into the grass fattening of cattle it was discovered that the value of the store was the most important factor. For these enquiries grazing costs varied little between farms and the managerial skill rested almost entirely in the purchase of the store animals. Both the price paid for the stores and the amount of increase in value during the season varied considerably, the inference being that high profitability depended on buying good cattle cheaply.

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(1) See Appendix I. Page 29.



Table 3 shows how the records were distributed according to the size of net margin. Out of the 22 records eight showed a loss up to £10, eight between £10 and £20 and six had a loss of over £20 per head.

AVERAGE COSTS AND RETURNS IN THE PRODUCTION OF YARD FATTENED CATTLE.  
WINTER 1953-54

TABLE 2

Per head

	All herds	Five most profitable	Five least profitable	Your herd
	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Cost of store cattle	69.16. 2.	70. 8.10.	67.18. 8.	
Price of fat cattle	92.18. 9.	93.18. 0.	92. 5. 4.	
Feeders' margin	23. 2. 7.	23. 9. 2.	24. 6. 8.	
Costs:-				
Grazing	12.10.	5. 9.	15. 5.	
Feeding stuffs - home grown <sup>(1)</sup>	20.14. 0.	12.13.10.	33.17.10.	
Feeding stuffs - purchased	7.19. 6.	7. 7. 2.	7.14. 4.	
Labour - manual	4.10.11.	3. 5. 9.	5. 1. 4.	
Labour - tractor, horse, etc.	4. 9.	9.10.	3. 2.	
Transport and droving - at purchase	17. 4.	1. 7. 2.	7. 1.	
Transport and droving - at sale	4.10.	4. 4.	4. 9.	
Market dues - at purchase	4. 2.	8. 9.	11. 7.	
Market dues - at sale	2.	-	-	
Machinery depreciation	2. 7.	5.11.	1.10.	
Overheads	1. 2. 8.	16. 5.	1. 5. 4.	
Miscellaneous	6.	-	1. 0.	
<b>TOTAL COSTS</b>	<b>36.14. 3.</b>	<b>27. 4.11.</b>	<b>50. 3. 8.</b>	
<b>NET MARGIN</b>	<b>-13.11. 8.</b>	<b>-3.15. 9.</b>	<b>-25.17. 0.</b>	

(1) Calculated at market values (includes straw for bedding).

DISTRIBUTION OF HERDS ACCORDING TO SIZE OF NET MARGIN PER HEAD

TABLE 3

Net margin per head	Number of records
Less up to £4.9	4
" " " £9.9	4
" " " £14.9	3
" " " £19.9	5
" " " £24.9	3
" " " £29.9	3
<b>TOTAL</b>	<b>22</b>

A consideration of the weight of the cattle in the sample (see Table 4) is marred by the fact that the weight of the store animal is based mainly on estimation. It appeared that the least profitable cattle were the ones gaining most in weight as would be expected from the more intensive feeding. On average high profit farmers were feeding heavier animals, and it is likely that they would have been at a disadvantage if selling under free marketing conditions.

ESTIMATED AVERAGE LIVE-WEIGHT GAIN<sup>(1)</sup> OF CATTLE

TABLE 4

	Per head						
	All herds		Five most profitable		Five least profitable		Your herd
	cwts.	qrs.	cwts.	qrs.	cwts.	qrs.	cwts. qrs.
Weight of store cattle	10	2	11	0	10	0	
Weight of fat cattle	13	0	13	1	12	3	
Weight gain	2	2	2	1	2	3	

(1) To nearest qr.

From the previous figures it is interesting to calculate the costs and returns per cwt. gain as shown in Table 5. The amount of increase in value (or the feeders' margin) per cwt. varied directly with profitability. The five best herds had an increase of £10.10s. 3d. per cwt. compared with only £8.16s. 6d. for the poorer herds. Costs per cwt. varied inversely with profitability so that it cost the more profitable farmers just over £12 to put a cwt. on their beasts whilst it cost the less profitable more than £18.

AVERAGE COSTS AND RETURNS PER LIVE CWT. GAIN

TABLE 5

	All herds	Five most profitable	Five least profitable
	£. s. d.	£. s. d.	£. s. d.
Feeders' margin	9.10.10.	10.10. 3.	8.16. 6.
Costs:-			
Feeding stuffs and grazing	12. 1.10.	9. 2. 4.	15. 7. 5.
Other	3. 1. 0.	3. 1.11.	2.16. 7.
Net margin	-5.12. 0.	-1.14. 0.	-9. 7. 6.

The figures for average costs and returns are examined in greater detail in the next four sections, under the following headings:-

- Store cattle
- Fat cattle
- Feeders' margin
- Analysis of costs and feeding stuffs.

IV. STORE CATTLE

Class and Breed

Over 90 per cent of the cattle included in the enquiry were steers, the rest consisting of heifers and drupe cows (see Table 6). The sample did not include any cow-heifers or special young cows. Bullocks accounted for only 60 per cent of the low profit herds but made up the whole of the most profitable group.

SIZE OF HERD, CLASS AND BREED OF ANIMAL, AND THE SOURCE OF SUPPLY

TABLE 6	Percentage of total cattle		
	All herds	Five most profitable	Five least profitable
Total number	396	41	72
Average number per herd	18	8	14
Class:-	per cent	per cent	per cent
Steers	91	100	61
Heifers	9	-	38
Drupe cows	■	-	1
Breed:-			
Hereford	19	47	-
Lincoln Red	65	29	100
Other Shorthorn	12	7	-
Friesian	3	17	-
Galloway Cross	1	-	-
Source:-			
Reared on the farm	■	-	1
Purchased - Irish	20	46	-
Purchased - other	80	54	99

■ Less than 0.5 per cent

The majority of the cattle were of the Lincoln Red breed, the favourite breed in the districts where the enquiry was held. The fact that the low profit herds were made up entirely of Lincoln Reds whereas the five most profitable herds had 47 per cent Herefords, may point to the fact that Lincoln Reds are not the best converters of food, but may merely arise from the fact that the farmers who were over-feeding their animals happened to be keeping Lincoln Reds.

Source of Supply

Irish cattle accounted for only 20 per cent of the total number of cattle in the survey, and it is interesting to note that the most profitable herds consisted of nearly 50 per cent Irish cattle, although this does not necessarily have any significance.

Markets

Nearly half the stores were purchased in local Lincolnshire markets and in Melton Mowbray. Local private sales made up another 12 per cent and purchases through dealers accounted for 29 per cent. This meant that the majority of the cattle were bought without the farmer travelling beyond his own district.

Two thirds of the Irish cattle were purchased in Ireland, mostly through agents, and the rest came from Scotland and York.

Age of Store Cattle

The average age of all cattle at purchase was  $2\frac{1}{2}$  years as shown in Table 7. Steers averaged 31 months and heifers 22 months.

AVERAGE AGE OF STORE CATTLE AT PURCHASE BY CLASS AND BREED

TABLE 7	Months per head	
	Average age in months	
Class:-		
Steers		31
Heifers		22
Drape cows		60
Breed:-		
Hereford		31
Lincoln Red		30
Other Shorthorn		29
Friesian		28
Galloway Cross		30
All types		30

There was little variation in age according to profitability and so these figures have not been shown in the table.

Cost and Weight

The figures in Table 8 give details of the cost and weight of store cattle, the average price paid for a store being nearly £70 at a weight of  $10\frac{1}{2}$  live cwts. The steers fetched over £10 per head more than heifers and were, on average, heavier animals. Herefords, Lincoln Reds and other Short-horns were all purchased at about £70 per head and the other breeds were not sufficiently well represented to give any reliable guide. Irish cattle cost just over £67 per head but this excluded transport from Ireland which averaged £2.16s.10d. per head.

AVERAGE COST AND ESTIMATED LIVE-WEIGHT OF STORE CATTLE BY CLASS AND BREED OF ANIMAL, AND THE SOURCE OF SUPPLY

TABLE 8	Per head		
	Value	Live-weight	
Class:-	£. s. d.	owts.	qrs.
Steers	70.17.10.	10	2
Heifers	59.10. 0.	8	1
Drape cows	40. 0. 0.	9	0
Breed:-			
Hereford	69. 6. 7.	10	2
Lincoln Red	70.11. 2.	10	1
Other Shorthorn	68.17. 8.	10	2
Friesian	61. 5.10.	10	0
Galloway Cross	65. 5. 0.	9	0
Source:-			
Reared on the farm	40. 0. 0.	9	0
Purchased - Irish	67. 4.10.	10	2
Purchased - other	70.10.11.	10	1
All types	69.16. 2.	10	2

The range of average prices paid by each farmer for store cattle was from just under £56 to £80 with the following distribution:-

<u>Average price of store</u>	<u>No. of herds</u>
Under £59.9	3
£60 and under £69.9	10
£70 and under £79.9	8
£80 and over	1
	<u>22</u>

From the data for prices and weights of store cattle the figures in Table 9 have been calculated, showing the average cost of store cattle per live cwt. and these throw light on some interesting points. The average cost of all stores was £6.15s. 0d. per cwt. but the amount paid varied inversely with profitability.

AVERAGE COST PER LIVE CWT. OF STORE CATTLE BY CLASS AND BREED OF ANIMAL AND SOURCE OF SUPPLY

TABLE 9

	Per live cwt.		
	All herds	Five most profitable	Five least profitable
Class:-	£. s. d.	£. s. d.	£. s. d.
Steers	6.14. 1.	6. 9. 1.	6.12. 1.
Heifers	7. 5.11.	-	7. 9. 0.
Drapo cows	4. 8.11.	-	4. 8.11.
Breed:-			
Hereford	6.11. 0.	6.10. 9.	-
Lincoln Red	6.17. 1.	6.10. 3.	6.16. 8.
Other Shorthorn	6.10. 6.	6. 7. 6.	-
Friesian	6. 4. 2.	6. 2.11.	-
Galloway Cross	7. 5. 0.	-	-
Source:-			
Reared on farm	4. 8.11.	-	4. 8.11.
Purchased - Irish	6. 7. 3.	6.10. 9.	-
Purchased - other	6.16.11.	6. 7.10.	6.17. 3.
All types	6.14.10.	6. 9. 1.	6.16. 8.

Although the high profit and the low profit farmers paid about the same per store animal (see Table 2) the latter group paid nearly 8s. 0d. more per cwt.

Store heifers cost less per head than steers, but were of a higher value per cwt. Irish cattle still showed a price below that of home-bred cattle - a reflection of the cost of transport and the difference of 4s. 6d. per cwt. that would be obtained on sale to the Ministry of Food.

V. FAT CATTLE

In the Spring the majority of the cattle in the sample were sold as fat animals to the Ministry of Food. All the cattle in the high profit herds were disposed of in this way whereas three per cent in the lower profit herds were sold as stores and three per cent became casualties during the winter.

DISPOSAL OF FAT CATTLE

TABLE 10

	Percentage of total cattle		
	All herds	Five most profitable	Five least profitable
Sold to Ministry of Food	83	100	94
Sold store	7	-	3
Casualty	1	-	3
Retained on farm	9	-	-
All methods	100	100	100

The cattle sold to the Ministry of Food received far higher prices than those sold as stores, as the better cattle were picked out to be sold in this way, the poorer and younger ones going as stores.

GRADE

The grades received for the fat cattle at sale were better for those farmers who were feeding at a more intensive level (see Table 11). These low profit farmers sold 59 per cent of their cattle at grades of SS and S, whilst the high profit herds had 66 per cent of their cattle with A+ and A grades. The cost of bringing an animal to the "special" grades does not appear to be rewarded by a corresponding increase in value. However, some farmers still prefer to aim for the higher grades merely for the pleasure of owning a fine-looking animal.

GRADES OF CATTLE SOLD TO MINISTRY OF FOOD

TABLE 11

Grade(1)	Killing out percentage	Percentage of cattle sold fat		
		All herds	Five most profitable	Five least profitable
SS	59 & over	21	5	22
S	58	32	29	37
A+	57	37	59	35
A	56	10	7	6
A-	55	■	-	-
B+	54	-	-	-
B	53	-	-	-
B-	52	-	-	-
C+	51	-	-	-
C	50	-	-	-
All grades	-	100	100	100

(1) Including grades for fat cows.

■ Less than 0.5 per cent.



PRICE AND WEIGHT

As can be seen in Table 12 the average price received per head of cattle was nearly £93 at an average live-weight of 13 cwts. Steers made more than the other classes, and Shorthorns were the breed acquiring the highest prices. The home-bred cattle were slightly heavier and, of course, made more than the Irish cattle.

AVERAGE PRICE AND LIVE-WEIGHT OF FAT CATTLE BY CLASS AND BREED OF ANIMAL, AND BY SOURCE OF SUPPLY

TABLE 12

	Price		Per head Live-weight	
	£.	s. d.	cwts.	qrs.
<b>Class:-</b>				
Steers	94.	2. 3.	13	0
Heifers	81.	18. 3.	11	0
Drape cows	55.	0. 0.	12	0
<b>Breed:-</b>				
Hereford	90.	9. 7.	12	2
Lincoln Red	93.	15. 4.	13	0
Other Shorthorn	94.	12. 4.	12	3
Friesian	87.	1. 8.	12	0
Galloway Cross	78.	13. 8.	10	1
<b>Source:-</b>				
Reared on the farm	55.	0. 0.	12	0
Purchased - Irish	89.	18. 2.	12	2
Purchased - other	93.	16. 4.	13	0
<b>All types</b>	<b>92.</b>	<b>18. 9.</b>	<b>13</b>	<b>0</b>

VI. FEEDERS' MARGIN

INCREASE IN VALUE AND WEIGHT

The feeders' margin is the increase in value between the cost of the store animal and the price at which it is sold when fat. The average for the cattle in the enquiry was just over £23 per head. In Table 13 the figures show that steers obtained a higher increase during the season than the heifer and cow class, and that the Shorthorns and Friesians obtained more than the other breeds.

AVERAGE INCREASE IN VALUE AND LIVE-WEIGHT OF CATTLE BY CLASS AND BREED OF ANIMAL, AND BY SOURCE OF SUPPLY

TABLE 13

Class:-	Increase in value	Per head	
		Increase in live-weight	
	£. s. d.	cwts.	qrs.
Steers	23. 4. 5.	2	2
Heifers	22. 8. 3.	2	3
Drape cows	15. 0. 0.	3	0
Breed:-			
Hereford	21. 3. 0.	2	0
Lincoln Red	23. 4. 2.	2	3
Other Shorthorn	25. 14. 8.	2	1
Friesian	25. 15. 10.	2	0
Galloway Cross	13. 8. 8.	1	1
Source:-			
Reared on farm	15. 0. 0.	3	0
Purchased - Irish	22. 13. 4.	2	0
Purchased - other	23. 5. 5.	2	2
All types	23. 2. 7.	2	2

For the types that were adequately represented in the sample the increase in weight during the season varied from two to  $2\frac{3}{4}$  cwts. although these figures may not be too reliable as the weights of the store cattle were based on estimations.

Increase in Value and Weight Per Day

Other figures that are of interest are those showing the average increase in value and weight per day of feeding and these are set out in Table 14. The increase in value per head per day was 2s. 5d. for all herds; for the low profit herds it was 2s. 7d. and for the more profitable herds it was as high as 3s. 1d.

AVERAGE INCREASE IN VALUE AND LIVE-WEIGHT OF CATTLE PER DAY

TABLE 14

Per head

	Increase per day	
	Value	Live-weight
	s. d.	lbs.
All herds	2. 5.	1.4
Five most profitable	3. 1.	1.6
Five least profitable	2. 7.	1.6

The increase in weight was the same for the high and the low profit groups at 1.6 lbs. per day. Although the low profit groups were feeding more intensive rations each day the cattle were not gaining as much in value and showed only the same increase in weight as those feeding at a lower level. This would suggest that the low profit group are feeding above the optimum amount so that the food is not being converted efficiently. Figures for the rations fed per day and for the length of the grazing season can be seen in Sections VII and VIII respectively.

A comparison of the average increase per day with that for the grass fattening of cattle in 1952<sup>(1)</sup> shows, for all herds, a higher increase in value from yard fattening although the increase in weight was slightly less. The most profitable group in Lincolnshire in the summer of 1952, however, achieved the same value increase of 3s. 1d. as the high profit herds in this present enquiry.

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(1) Richardson, P. P. The Fattening of Cattle on Grass: A Study of Management, Costs and Returns (Final Report). Published October, 1953. Farmers' Report No. 123.

VII. ANALYSIS OF COSTS AND FEEDING STUFFS

In addition to buying store cattle, the total cost of fattening cattle in the yard was on average nearly £37 per head. The division of this cost into the various items of feeding stuffs, labour etc., can be seen by referring back to Table 2 in the general section on average costs and returns, and the most interesting point arising from this table is the over-riding importance of the cost of feeding stuffs.

The figures in Table 15 below illustrate the percentage importance of each item in relation to total costs (including that of the store animal). On average the store accounted for 65 per cent, whilst feeding stuffs made up as much as 27 per cent, a very high figure in comparison with that for grass fattened cattle where the store accounted for over 90 per cent of all costs in 1952.<sup>(1)</sup> In the low profit herds feeding stuffs were of even more importance and the cost of the store was only 57 per cent of total costs. The other items were relatively unimportant; labour accounting for only four per cent and transport, market dues, overheads, etc. made up only three per cent.

PERCENTAGE IMPORTANCE OF ITEMS OF COSTS<sup>(i)</sup>

TABLE 15

	All herds	Five most profitable	Five least profitable
	Per cent	Per cent	Per cent
Store cattle	65	72	57
Grazing	1	-	1
Feeding stuffs - home grown <sup>(i)</sup>	19	13	29
Feeding stuffs - purchased	8	8	7
Labour - manual	4	3	4
Other costs	3	4	2
TOTAL COSTS	100	100	100

<sup>(i)</sup> Calculated at market values (includes straw for bedding).

Average Costs per Day

The data in Table 16 shows the expense of keeping an animal for one day in the yard. On average the cost was 3s.10d. per day, of which 3s. 0d. was for feeding stuffs, whereas the increase in the value of the animal per day was only 2s. 5d. (see Table 14). In other words there was a loss of 1s. 5d. on each animal per day. The difference between the cost and the value increase per day was not quite so large for the high profit herds, but for the low profit herds was even more than the average, the cost of feeding stuffs alone being as high as 4s. 5d. per day.

<sup>(1)</sup> Richardson, P. P. The Fattening of Cattle on Grass: A Study of Management, Costs and Returns (Final Report). Published October, 1953. Farmers' Report No. 123.

AVERAGE COSTS (1) PER DAY

TABLE 16

	Per head		
	All herds	Five most profitable	Five least profitable
	s. d.	s. d.	s. d.
Feeding stuffs - home grown <sup>(2)</sup>	2. 2.	1. 8.	3. 7.
Feeding stuffs - purchased	10.	11.	10.
Labour	6.	5.	6.
Other costs	4.	7.	5.
<b>TOTAL COSTS</b>	<b>3.10.</b>	<b>3. 7.</b>	<b>5. 4.</b>

(1) Excluding cost of store cattle.

(2) Calculated at market values (includes straw for bedding).

Some Recalculations of Costs

I. As previously stated in Section III home grown feeding stuffs were valued at market prices as the true cost was considered to be the amount of income that had been given up by feeding the crops to the cattle. In case these estimates were too high, the foods have also been valued at cost of production and this recalculation could reduce the average loss by £5 per head (see Table 17).

In circumstances where the crop could not have been sold, as was particularly likely with the poor market for some cereals during the Winter 1953-54, it is feasible that the cost of production would be a truer cost. This was also the opinion of some farmers growing crops just for the purpose of feeding to their cattle.

RECALCULATION OF NET MARGIN WITH HOME GROWN FEEDING STUFFS (1) VALUED AT COST OF PRODUCTION, WITH A CREDIT FOR MANURE PRODUCED, AND EXCLUDING THE COST OF LABOUR

TABLE 17

	Per head		
	All herds	Five most profitable	Five least profitable
	£. s. d.	£. s. d.	£. s. d.
Net margin as originally calculated	-13.11. 8.	-3.15. 9.	-25.17. 0.
<b>Recalculations of net margin:-</b>			
(I) With feeding stuffs charged at cost of production	- 8.12.11.	- 9. 3.	-19. 5. 8.
(II) and with a credit for manure produced	- 2. 1. 4.	+5. 0. 0.	-12. 9. 0.
(III) and excluding the cost of labour	+ 2. 9. 7.	+8. 5. 9.	- 7. 7. 8.

(1) Including straw for bedding.

II. In the original calculations no credit was made for the manure produced by the cattle during the winter together with the straw used as bedding. If this manure and straw is credited at a £ per ton, then a considerable addition can be made to the profitability of the cattle (see Table 17). There is evidence that this credit of a £ per ton is too low.<sup>(1)</sup>

III. As the farms were mainly arable, with over half the land under cash crops, it is possible that they would carry a larger labour force in the Winter than really necessary in order to have sufficient workers for the crops during the rest of the year. The cattle would, therefore, be using up labour that might otherwise have been idle, and in this case it is doubtful whether the cost of the labour should be charged to the cattle. Part or all of the cost of £4.10s.11d. per head might, therefore, be ignored.

These three recalculations could bring the average profit to over £2 per head, and it can be seen that to a certain extent the loss in feeding yard cattle may only be a loss on paper not actually paid out by the farmer. However, when all possible allowances are made the low profit herds were still making a loss of over £7 per head.

#### Quantities of Feeding Stuffs

The assessment of the quantities of feeding stuffs given to the cattle was entirely dependent on the farmer's judgement. In some, but not all cases, the foods were weighed and fortunately it was for the higher value foods, purchased cakes etc., that the greatest accuracy was obtained. Such foods as hay and straw were open to some inaccuracy.

The estimated quantities fed per beast during the winter are set out in Table 18 and it is interesting to note how much more was fed to the lower profit cattle. On average the cattle received seven cwts. of cereals and beans, whilst the low profit cattle received as much as 13 cwts. per head. Mangolds were the most popular root, whilst little attention was paid to fodder beet, and only two farmers in the sample fed silage to their yard cattle. The average purchases of feeding stuffs were 4 cwts. of sugar beet pulp, and nearly 3 cwts. of cotton, linseed and other cattle cakes. The low profit herds fed less sugar beet pulp but more of the expensive cotton and linseed cakes.

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(1) F. Rayns and A. C. Owers writing in 1950 about trials carried out at Sprowston state that "At the present prices of farm produce the increases over the rotation, including the value of the hay, from one ton of dung are worth 62s. 0d." However, this excluded the cost of carting and spreading.

Experiments in the Winter Fattening of Bullocks. "Farming". The Journal of Agricultural Progress. Vol. 4. 1950. p.170.

QUANTITIES OF FEEDING STUFFS GIVEN TO CATTLE DURING THE WINTER

TABLE 18

	Per head					
	All herds		Five most profitable		Five least profitable	
	cwts. qrs.		cwts. qrs.		cwts. qrs.	
Home grown:-						
Wheat	...		-		-	
Barley		2	-			3
Oats	1	3	-		6	2
Mixed corn	4	2	3	2	5	0
Beans		2	-			3
Linseed	...		...		-	
Swedes	1	0	-		-	
Mangolds	31	2	24	2	54	2
Fodder beet	...		-			2
Potatoes	5	2	2	2	16	3
Kale	...			3	-	
Beet tops	2	1	-			2
Meadow hay	1	3	1	2	4	0
Seeds hay	11	1	8	1	12	3
Grass silage	2	0	-		-	
Pea haulm silage		2	5	3	-	
Straw and chaff(1)	24	0	23	1	31	1
Threshed ryegrass	1	0	-		-	
Purchased:-						
Sugar beet pulp	4	0	3	2		2
Sugar beet tailings	1	2	-		-	
Bean meal		1	-		-	
Pea meal	...		-		-	
Cotton cake	1	0		2	4	0
Linseed cake		1	-		1	2
Other cattle cakes	1	2	2	0		2

... Less than  $\frac{1}{8}$  cwt.

(1) Including straw for bedding.

A calculation of the total starch equivalent and protein equivalent for these feeding stuffs (see Table 19) shows that the less profitable cattle received twice as much of both items as the more profitable cattle. The low profit cattle were receiving nearly 1,000 lbs. S.E. per live cwt. gain compared with only 570 lbs. for the high profit group.

ANALYSIS OF FEEDING STUFFS GIVEN TO CATTLE DURING THE WINTER

TABLE 19

	All herds	Five most profitable	Five least profitable
	lbs.	lbs.	lbs.
Per head:-			
Dry matter	4,171	2,950	5,668
Starch equivalent	1,797	1,281	2,739
Protein equivalent	275	195	402
Per live cwt. gain:-			
Dry matter	1,668	1,311	2,061
Starch equivalent	719	569	996
Protein equivalent	110	87	146

The figures in Table 20 show the average ration fed to a beast per day. Far more concentrates were fed by the low profit than the high profit farmers. More straw may have been consumed than shown in the table, as 14 lbs. per head per day has been deducted from the total quantity as presumed used for litter. This is an arbitrary figure anyway, and the farmer's reply when asked the amount of straw consumed was usually "ad lib". Not only are the rations fed per day higher for the low profit herds, but they were fed for three weeks longer than those for the high profit herds (see Table 22 below).

A study of the analysis of the rations shows the average ration for all herds to be very near to standard requirements. It is clear that the low profit farmers were feeding more intensively than necessary to obtain the increase of  $1\frac{1}{2}$  lbs. live-weight per day; in other words the food was not all being converted efficiently.

The average ration fed to the high profit herds appears to be rather low partly due to the fact that the bullocks were fed very slowly at the beginning of the winter and the rations increased during the season. The average daily ration does not show therefore, the intensive feeding that preceded the sale of the cattle, whereas the low profit farmers appeared to feed high rations for a far longer period.

From the data in this enquiry one fact appears to be out-standing, and that is the need for the more scientific feeding of yard cattle. The intensive feeders put forward the argument in favour of their system that they wish to produce more and better quality manure. The fact that the manure is necessary to the farm is not disputed, but it is suggested in the next section that the nutrients (nitrogen, phosphate and potash) might be put into the soil more cheaply by artificials than by the intensive feeding of the cattle.





VIII. MANURE PRODUCED, LENGTH OF FATTENING PERIOD AND YARD SIZE

Manure Produced

The quantity of manure produced varied according to the length of time the animals remained in the yard, the average being about 6½ tons (including bedding straw) per beast. The amounts given in Table 21 are only rough estimates based on the number of cartloads to be removed from the yard.

QUANTITY OF MANURE PRODUCED(1)

TABLE 21

	Per head	
	QUANTITY	
	tons	cwts.
All herds	6	12
Five most profitable	5	9
Five least profitable	6	17

(1) Including straw

The production of manure is the prime object of many farmers in keeping yard cattle, with the result that profitability becomes secondary to producing a large quantity of good quality manure and the cattle are kept in the yards longer than necessary with feeding rations beyond standard requirements.

It is thus suggested that the combination of poorer quality manure with purchased artificial fertilisers would benefit the farm more than the intensive feeding of cattle to produce farmyard manure with a high percentage of plant food. The cost of putting into the soil by artificial fertilisers the same quantity of nutrients that are in a ton of average quality cattle manure is only about 15s. 0d. (1) This is for fresh manure before any of the value has been lost by exposure to rain etc. Intensive feeding might increase the nutrients in a ton of manure by as much as a third but this would only raise their value to 20s. 0d.

Supposing a farmer feeds 2 lbs. per head per day of undecorticated cotton cake (at a cost of about £24. 0s. 0d. per ton) above the standard ration just to obtain better quality manure he will, during an average season of 170 days (see Table 22 below) feed about 3 cwts. extra. This

(1) Calculated from fertiliser prices quoted in the "Farmer and Stockbreeder" August 24th - 25th, 1954, and the analysis of bullock manure quoted in "Chemicals, Humus and the Soil". Donald P. Hopkins p. 94. Faber and Faber Limited, 1949.

will mean an additional expenditure of £3.12s. 0d. per beast, and the nutrients in the manure resulting from the feeding of this cotton cake will have a value of only about 5s. 0d. (1)

Length of Fattening Period

The fact that the low profit herds were keeping their animals in yards for longer periods than the high profit herds has already been mentioned in connection with the quantities of feeding stuffs given during the season. Table 22 shows the average number of days each beast was kept both on grass during the Autumn and later in yards. The low profit herds were kept for 27 weeks; for three weeks in the Autumn they were on grass and then for 24 weeks they were in yards. The high profit herds were kept for only 22 weeks on average, 21 of which they were in yards.

LENGTH OF FATTENING PERIOD

TABLE 22

	Days per head		
	All herds	Five most profitable	Five least profitable
Autumn grazing	19	9	23
Yard	172	145	166
Total fattening period	191	154	189

Yard Size

The average amount of yard space allowed to each animal was 18 sq. yds., although the individual results showed considerable variation from eight to 41 sq. yds. The majority of farmers, however, provided between 15 and 22 sq. yds. per head of cattle.

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(1) Residual Values of Fertilisers and Feeding Stuff. Department of Agriculture for Scotland. Advisory Leaflet No. 24 (New Series).

## IX. FUTURE PROSPECTS

A glance at the world situation in beef production and trade<sup>(1)</sup> shows that there was an increase in the total output of beef and veal during 1953. As far as the United Kingdom was concerned output at home increased again after a fall during 1952 and was 27,000 tons above the annual pre-war production. This year (1954) there is evidence that beef cattle numbers in this country have risen.

Imports into the United Kingdom during 1953 were still 47 per cent lower than pre-war although there was a considerable increase over the amount imported during 1952. However, it seems likely that imports may fall slightly for 1954 as a whole. The amount of beef and veal consumed per head of population during 1953 was still 18 lbs. or a third below that of pre-war, showing that it is probable consumption would be raised if beef could be sold at a price within reach of more wage packets - although, on the other hand, after 14 years of rationing people are no longer used to a high meat diet.

What is going to happen in the future? Will prices be high enough to encourage farmers in this country to continue in the production of beef cattle, particularly from yard fattening? Prices cannot fall below those of the individual guarantee which acts as a "safety net" to prices in the free market. As can be seen from Figure 1 the guarantees for Grade A Light animals in 1954-55 are well below the fixed prices for the previous year, 1953-54, for Grade A+ cattle and do, in fact, conform approximately to those of the A- Grade. At the time of writing it is too early to see what trend the average market prices will take, but it does appear that there is going to be a considerable fall this Autumn as anticipated, and the guaranteed individual price will be paid for many of the cattle fattened on grass. It is likely that next Winter and Spring will see a corresponding rise in price when there will be a shortage of fresh meat.<sup>(2)</sup>

If the yearly average price is lower than that of the previous year, feeders will also receive compensation by way of the collective guarantee.

Ultimately there is likely to be a shift in the supply position as feeders try to avoid sale at the time of the autumn glut and aim to sell at those times of the year when prices are higher. This, in turn, will result in a more steady price throughout the year.

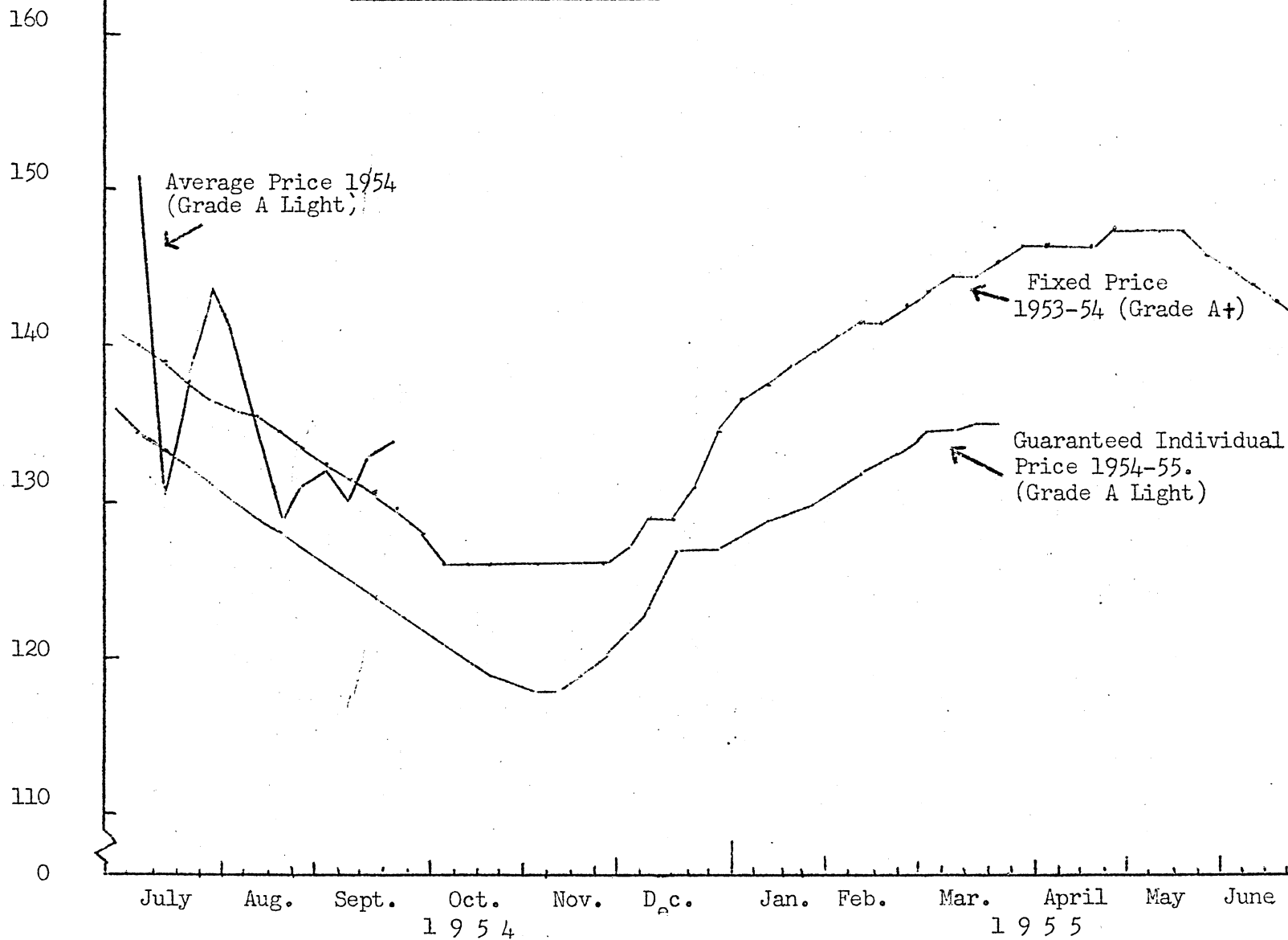
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- (1) The Commonwealth Economic Committee. Intelligence Bulletin. July, 1954.
- (2) P. P. Richardson. Beef Cattle Prices under Free Marketing. Farm Management Notes. No. 11. Spring, 1954.

Shillings  
per live  
cwt.

FIGURE I.

GRAPH SHOWING GUARANTEED INDIVIDUAL PRICES AND AVERAGE MARKET PRICES  
(GRADE A : LIGHT) FOR 1954-55 AND MINISTRY OF FOOD FIXED PRICES  
(GRADE A +) FOR 1953-54.



It is doubtful whether there can be any large increase in the price of home produced meat during the Winter, without many housewives looking for substitutes in frozen meat, fish etc. There is potentially a good market for fresh meat the whole year round, but the more the price of that meat increases the less will be the demand.

What will be the position of the yard-feeder if winter prices do not rise sufficiently to compensate for his present high costs? Will he give up producing yard-fed cattle? This is not a satisfactory answer as the manure is needed for the production of his crops and the reduction of fresh beef would mean a reduction in the standard diet of many people in this country.

A better answer is for the farmer to reduce the cost of fattening yard cattle, and from the results of this enquiry it would seem apparent that many farmers could do this. A high proportion of farmers are feeding more starch and protein than their animals can convert efficiently, and few are feeding such cheap and valuable foods as silage and fodder beet. The large animals, which were necessary when only poor grade feeding stuffs were available are still in great demand, when the aim should be to fatten cattle at a younger age, and so reduce the total costs from rearing to sale.

Whilst farmers are giving their cattle more feeding stuffs than are necessary, beef will inevitably be expensive to produce and if the Government subsidises these farmers with guaranteed prices the production of beef will be a burden to the taxpayer. The solution is, then in the more scientific feeding of yard cattle.

X. SUMMARY

1. The enquiry was based on information obtained from 22 herds and altogether included 396 cattle.
2. These herds were all on Lincolnshire arable farms which averaged just over 300 acres in size and had more than 50 per cent of their land under cash crops.
3. Steers accounted for 91 per cent of the cattle and Lincoln Reds were the most popular breed. 20 per cent of the stores were Irish.
4. In the Spring, 83 per cent of the cattle were sold fat to the Ministry of Food. The low profit herds obtained better grades at sale than the high profit herds.
5. The sample was limited to cattle purchased during the Autumn, 1953 to avoid the necessity of making estimations of the value of stores.
6. For the winter of 1953-54 the average result was a loss of £13.11s. 8d. per head of cattle with a live-weight increase of  $2\frac{1}{2}$  cwts. In obtaining this result home grown feeding stuffs were charged at market values, and no credit was made for manure produced. By this method of calculation all herds showed a loss.
7. If feeding stuffs were calculated at cost of production the average loss per head could be reduced by £4.18s. 9d.
8. The amount of manure produced per head was about  $6\frac{1}{2}$  tons (with straw) and a credit of £6.11s. 7d. could be made per beast.
9. By calculating feeding stuffs at cost of production and including a credit for manure, the average loss can be reduced to £2. 1s. 4d., and 11 of the herds made to show a profit instead of a loss.
10. A study of the high and low profit herds suggests that the method of feeding was the over-riding factor in determining profitability although the price and type of stores was, of course, still important. The cost of feeding an animal in the low profit herds was twice that for the high profit herds.
11. The store animal accounted on average for 65 per cent of total costs, and feeding stuffs for 27 per cent. For the low profit herds, feeding stuffs accounted for as much as 36 per cent of total costs.
12. The average costs per day were 3s.10d. per head, of which 3s. 0d. was for feeding stuffs.

13. The average increase in value per day was 2s. 5d. with a live-weight increase of 1.4 lbs.
14. The fattening period for all herds was 172 days in the yard per beast, whilst for the most profitable herds, it was only 145 days.
15. On average the cattle each received 11.2 lbs. starch equivalent per day and 1.6 lbs. protein equivalent. For the low profit herds the amounts were as high as 14.9 lbs. and 2.4 lbs. respectively.
16. Many of the farmers in the enquiry with less profitable herds appeared to be feeding their cattle very intensively to obtain manure with a high percentage of plant food. It has been suggested in this report that it would be cheaper to feed at a lower rate to obtain poorer quality manure, and combine it with artificial fertilisers.
17. It is likely that prices will rise considerably this winter, but if so demand for fresh beef is likely to be reduced.
18. There is need for many farmers to employ more efficient methods of feeding so that the cost of producing winter beef may be lowered.



APPENDIX I.

Farm Code No.

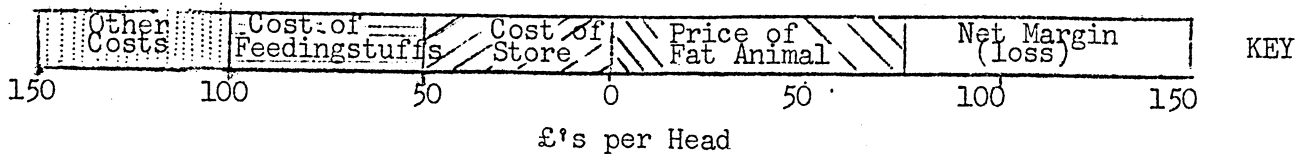
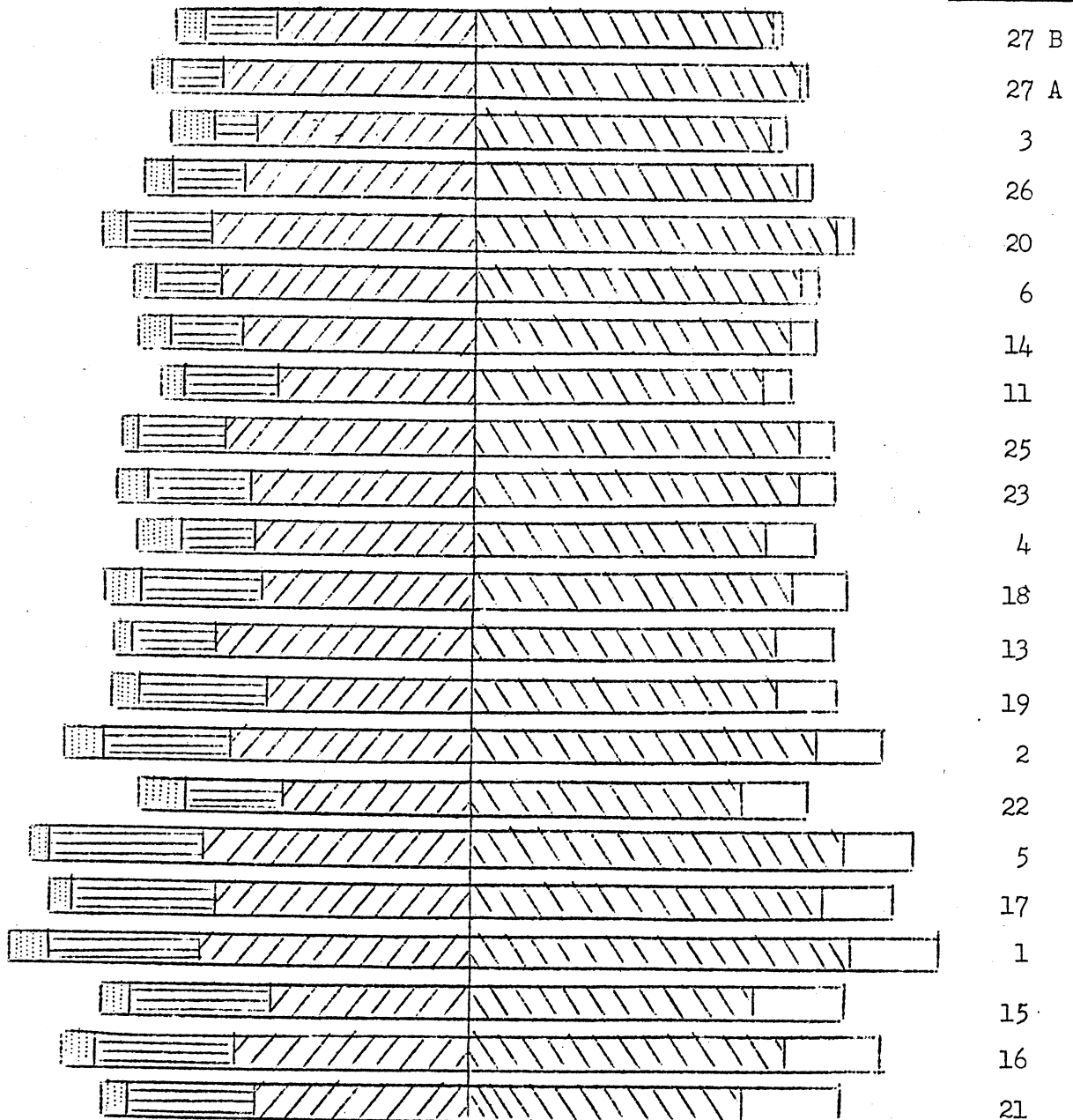


FIGURE II. DIAGRAM SHOWING AVERAGE COSTS AND RETURNS PER HEAD OF CATTLE FOR EACH HERD (in descending order of Profitability).  
(Your herd marked with red ring).

APPENDIX II.

STANDARD CHARGES USED AND PROCEDURES ADOPTED IN THIS INVESTIGATION

LABOUR

The charges for labour, were as follows, unless the farmer paid more than the standard rate, when the full amount was charged:-

	<u>Per hour</u>
	s. d.
Men	3. 0.
Women	2. 3.
Youths	2. 1.
Wheel tractor	4. 0.
Tracklaying tractor	5. 6.
Lorry	4. 6.
Horse	1. 4.

Contract work was taken at cost.

MACHINERY DEPRECIATION AND REPAIRS

A charge of 2s. 6d. per hour of tractor work and 7½d. per hour of horse work was made in order to cover depreciation and repairs to all machinery.

OVERHEADS

Overheads were calculated for each record on the basis of 5s. 0d. for each £ of direct manual labour.

FARMYARD MANURE

Where an attempt was made to assess the credit due to the yard-fattened cattle for the manure produced, this was estimated at a value of £1 per ton.

FEEDING STUFFS

- (1) Purchased feeding stuffs were charged at the actual prices paid by the farmer.
- (2) Home grown feeding stuffs were charged at the average market price for the period 1st December, 1953 to 31st March, 1954. If the product was not saleable an estimated cost of production was used. (Also a recalculation of costs was made in which all feeding stuffs were charged at cost of production). The following were the standards used:-

	At market price (per ton)	At cost of production (per ton)
	£. s. d.	£. s. d.
Wheat - feeding	26. 0. 0.	15. 0. 0.
Barley - feeding	25. 0. 0.	14.10. 0.
Oats - feeding	22. 3. 0.	14.10. 0.
Mixed corn <sup>(1)</sup>	24. 5. 0.	16. 0. 0.
Beans	27. 0. 0.	22. 0. 0.
Linseed	36. 0. 0.	57.10. 0.
Turnips	-	2. 2. 6.
Swedes	-	2. 2. 6.
Mangolds	3. 0. 0.	2. 2. 6.
Fodder beet	4.10. 0.	2. 2. 6.
Potatoes	4.10. 0.	8. 0. 0.
Kale	-	1.10. 0.
Cabbage and Savoys	-	2. 0. 0.
Beet tops	-	2. 0. 0.
Meadow hay (loose in rick)	5.17. 0.	3. 0. 0.
Seeds hay (loose in rick)	5.17. 0.	4. 0. 0.
Grass silage	-	2.17. 6.
Arable silage	-	3.11. 6.
Pea haulm silage	-	1. 0. 0.
Wheat straw (baled)	1.10. 0.	1. 0. 0.
Barley straw (baled)	1. 0. 0.	1. 0. 0.
Oats straw (baled)	1. 9. 0.	1. 0. 0.
Threshed ryegrass	4.10. 0.	4. 0. 0.
Chaff	-	-

Grazing 8d. per head per day.

(1) For ration consisting of  
two fifths barley  
two fifths oats  
one fifth beans

