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UNIVERSITY OF NOTTINGHAM

Department of Agricultural Economics

NOV. 1955

F. R. No. 133



Cattle Feeding

THE PROFITABILITY OF FATTENING CATTLE 1953-54



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PRICE 2s. 0d.

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MARCH, 1956.

C O R R I G E N D U M .

"The Profitability of Fattening Cattle 1953-54", by Prudence P. Richardson. November, 1955. Farmers' Report No. 133.

Table 5, Page 8. In the column for the "3 most profitable herds" the item of Feeding stuffs - home grown 3 shillings to read "Feeding stuffs - home grown £4."

THE PROFITABILITY OF FATTENING CATTLE 1953-54.

- I. Wintered in Yards and Finished on Grass.
- II. Outwintered on Grass and Finished on Grass.

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I. INTRODUCTION

There is much controversy concerning the relative advantages of fattening cattle on grass or in yards. In the East Midlands Province¹ both systems are practised. Many farms have no yards so grass fattening is the only practicable system. On the other hand, some of the more intensive arable farms have no grass. Nevertheless in many parts of the Province farmers are able to chose between finishing the cattle in yards or on grass.

During 1953-54 an enquiry was conducted by the University of Nottingham Department of Agricultural Economics to compare the profitability of fattening cattle under various systems. Information was obtained from 38 farmers who supplied data for 47 herds. The investigation was confined to cattle purchased during Autumn, 1953, and fattened in one of the following ways:-

(a) Fattened in yards

Information was furnished from 22 herds (totalling 396 cattle) fattened in yards in Lincolnshire. The results have been published² and they are used in Section V of the present report for comparison with the other systems.

(b) Wintered in yards and fattened on grass

This method was studied on 10 herds (totalling 535 cattle). Throughout this report this group of herds will be referred to as "Inwintered".

(c) Outwintered and fattened on grass

Data from 15 herds (totalling 323 cattle) mainly in Leicestershire were used to examine this method. Throughout this report these will be referred to as "Outwintered".

¹ Derbyshire, Nottinghamshire, Leicestershire, Rutland and Lincolnshire, (Kesteven and Lindsey).

² RICHARDSON. PRUDENCE P. "The Profitability of Yard Fattened Cattle 1953-54". 1955. Farmers' Report No. 128. University of Nottingham School of Agriculture, Department of Agricultural Economics, Sutton Bonington, Loughborough.

The chief item of cost in fattening cattle is the price paid for the store animal. It often determines the level of profit achieved in a fattening enterprise. Farmers' estimates of the market value of home reared stores are not always reliable and for the sake of greater accuracy only purchased cattle were considered in this enquiry.

Grateful acknowledgement is made to the farmers who co-operated for their interest and help. Without this the enquiry would not have been possible.

II. CROPPING AND STOCKING ON SAMPLE FARMS

As can be seen from Table 1 the farms included in the enquiry had a high average acreage. There was considerable variation in size amongst these farms. The table shows the details of cropping and stocking of the farms in the inwintered and outwintered groups.

LAND UTILISATION AND LIVESTOCK CARRY ON FARMS IN SAMPLE

	Per farm and per 100 acres			
	Per farm		Per 100 acres	
	Inwintered herds	Outwintered herds	Inwintered herds	Outwintered herds
Crops:	acres	acres	acres	acres
Wheat	129	67	15	11
Barley	109	40	13	7
Oats	45	32	5	5
Sugar beet	24	3	3	1
Potatoes	42	12	5	2
Market garden crops	3	-	(a)	-
Other crops ¹	163	102	19	17
Permanent grass	252	276	30	47
Temporary grass	86	57	10	10
TOTAL ACREAGE	853	589	100	100
Beef cattle:	Nos.	Nos.	Nos.	Nos.
Cows and bulls	6	6	1	1
Other cattle over 2 years	154	116	18	20
Other cattle under 2 years	14	14	2	2
Dairy cattle	2	3	(a)	(a)
Sheep	336	215	43	37

¹ Mixed corn, fodder root crops, peas for harvesting dry, etc.
(a) Less than 0.5

As might be expected, farms which outwintered cattle had a higher proportion of their land under grass - 57 per cent. compared with only 40 per cent. on the farms where inwintering was practised. Conversely, the farms where the cattle were inwintered had more cash crops and, therefore, more by-products especially straw. Over 25 per cent. of the land on these farms was devoted to wheat and barley growing, and eight per cent. to sugar beet and potatoes. On the farms where the outwintered cattle were kept the corresponding figures were 18 per cent. and three per cent.

The numbers of livestock carried per 100 acres did not vary much between the farms with inwintered herds and those with outwintered ones. One farm where inwintering was practised had some breeding stock and so also had three farms where outwintering was being done, but home bred stores were excluded from the enquiry. One farm with an inwintered herd and two farms with outwintered herds also carried dairy herds.

III. AVERAGE COSTS AND RETURNS FROM CATTLE WINTERED IN YARDS AND FATTENED ON GRASS.

Results obtained from the costing of this group are given in Table 2. After allowing a credit for the value of the manure produced in the yards, the average profit per beast was nearly £6., but if no credit is given for manure the average loss is almost £1.

The low level of profit shown by this system of cattle fattening is not altogether surprising. Two reasons chiefly account for it. Firstly, there is the tendency of farmers to feed their inwintered cattle at a rather higher level than is necessary. (This was noticed in this Department's previous report on cattle totally fattened in yards¹). Secondly, the other major factor is the period in which the enquiry was conducted. The stores were purchased in Autumn, 1953, when prices were rather high, and the majority were sold as fat animals in Autumn, 1954, when marketing had just been decontrolled. At this period prices for fat cattle reached a very low level and those farmers who did not hold their cattle until prices rose again after Christmas found they were selling at very little more than they had paid a year earlier for the store cattle.

¹ Ibid.

INWINTERED HERDS - AVERAGE COSTS AND RETURNS

Table 2

	Per head					
	10 herds		3 most profitable		3 least profitable	
	£.	s.	£.	s.	£.	s.
Price of fat animal	84.	1.	86.	12.	82.	4.
Deficiency payments	1.	0.		9.	1.	10.
Credit for manure produced	6.	9.	5.	15.	7.	9.
TOTAL PRODUCTION	91.	10.	92.	16.	91.	3.
Costs:						
Store animal	64.	12.	64.	5.	65.	12.
Grazing	3.	18.	3.	13.	4.	12.
Feeding stuffs - home grown ¹	10.	1.	6.	15.	12.	16.
- purchased	2.	2.	1.	13.	2.	19.
Labour - manual	2.	4.	1.	16.	2.	12.
- tractor, horse, etc.		6.		5.		6.
Transport - at purchase		16.		13.	1.	0.
- at sale		4.		3.		5.
Market dues - at purchase		-		1.		-
- at sale		17.		13.	1.	2.
Machinery depreciation		3.		2.		3.
Overheads		12.		10.		14.
Miscellaneous		1.		1.		1.
TOTAL COSTS	85.	16.	80.	10.	92.	2.
NET MARGIN	+ 5.	14.	+ 12.	6.	(-)	19.

¹ At market values.

In this group of inwintered herds the purchase of the store beast accounted for 75 per cent. of the total costs, and the only other cost of importance was the feeding. Hand fed feeding stuffs accounted for 14 per cent of the total costs. Excluding the purchase price of the store animal these feeding stuffs formed 57 per cent. of all costs incurred in fattening. Grazing accounted for a further 18 per cent. Home grown feeding stuffs, other than grass, were charged to the costs at market values. If they had been charged at the cost of production the total cost of fattening would have been £1. 6s. per beast less. By feeding these foods farmers lost any margin between their costs of production and market value. It seems reasonable, therefore, to charge them at market value.

On average only about five per cent. of the hand fed foods was consumed during the grazing period. This consumption took place chiefly in the Spring or in the late Autumn when farmers were trying to retain the cattle until prices rose.

Grazing costs were nearly £4. per beast. Just over £1. was incurred in Autumn grazing between the date of purchase and the time when the cattle were placed in the yards.

A few possible defects in management are suggested when the results of the most profitable and least profitable inwintered herds are compared. Three herds showed an average profit margin of £12. per beast but the three herds with the worst results had an adverse margin of nearly £1. per head. Both of these results are arrived at after giving a suitable credit for the value of the manure produced in the yards during the Winter.

The farmers whose herds were least profitable had paid rather higher prices for their store animals. When the cattle were sold after fattening over £3. more per beast was obtained by the farmers who made higher profits than by the farmers with losses. It is noteworthy that the farmers who recorded the higher profits had also much lower costs per beast for feeding stuffs. The farmers whose herds made the higher profits were either:-

- (1) feeding more efficiently (i.e. choosing foods with a lower cost for the nutrients provided, and not overfeeding nor yet wasting food), or,
- (2) keeping the cattle in the yards for a shorter period, or
- (3) buying cattle which were more efficient at converting food into beef, and so would fatten on less feed, or,
- (4) were more skilled in selecting a marketing date when prices were favourable.

In regard to (4) it is evident that marketing the finished cattle when prices ruling are unfavourable to the seller may cancel out the effects of efficient management during the fattening period. In this enquiry, some farmers kept their cattle off the market in the hope that prices would rise. Prices did rise after Christmas. Other farmers sold their cattle in mid-Autumn and the prices they secured for them were extremely low.

Table 3 shows that the Summer feeding period was, on average, much longer for the herds which made the higher profits. This suggests that the cattle were kept until prices rose. In these herds the yard feeding period was shorter than that of the less profitable herds, and a greater proportion of their fattening period was on grass.

INWINTERED CATTLE - LENGTH OF FATTENING PERIOD

Table 3	Days		
	10 herds	3 most profitable	3 least profitable
Autumn grazing	59	45	64
Yard feeding	131	131	148
Summer grazing	139	198	110
TOTAL FATTENING PERIOD	329	374	322

The cost of feeding stuffs (excluding grazing) averaged £8. 8s. per head in the three most profitable herds, but in the three least profitable it was £15. 15s. Despite this difference in feeding costs, the farmers who owned the three herds showing greatest profits had achieved a difference of nearly £23. between the purchase price and the sale price of their cattle. The comparable figure for the farmers with the three least profitable herds was only £18. The sale price is inclusive of amounts received under the Deficiency Payments Scheme.

Table 4 shows that the three least profitable herds attained $\frac{1}{2}$ -cwt. more increase in live weight per head than the three most profitable during the entire feeding period. Little significance can be attached to this as the sample of herds tested was small, and the ingoing weights of the store cattle were generally merely farmers' estimates. The outgoing weights were mainly obtained from weighings at the market on the day of sale. The average outgoing weights for individual herds ranged from 10 cwts. 1 qr. to 13 cwts. 2 qrs. The fact that in Table 4 the 10 herds, the three most profitable and the three least profitable herds all averaged exactly the same figure (12 cwts. 2 qrs.) is coincidental.

Although the least profitable herds achieved the greatest increase in live weight they do not appear in a favourable light when the costs of obtaining 1 cwt. increase are compared. It cost £5. 18s. for grazing and other feeding stuffs for the cattle in these

INWINTERED CATTLE - ESTIMATED LIVE WEIGHT OF CATTLE

Table 4

	Per head					
	10 herds		3 most profitable		3 least profitable	
	cwts.	qrs.	cwts.	qrs.	cwts.	qrs.
Weight of store beast	9.	2.	9.	2.	9.	0.
Weight of fat beast	12.	2.	12.	2.	12.	2.
Weight gain	3.	0.	3.	0.	3.	2.

least profitable herds to gain an increase in live weight of 1 cwt. per beast. The most profitable herds secured a similar increase at a cost of £4. 15s.

IV. AVERAGE COSTS AND RETURNS FROM CATTLE OUTWINTERED ON GRASS AND FATTENED ON GRASS.

This is the group of herds where the cattle were out on grass-land during the entire feeding period. The average profit for this group was almost £6. per head - see Table 5. It must be emphasised that for this group no attempt has been made to arrive at a credit for the value of the manure produced. When the cattle are kept in yards the manure can be accumulated and then carted out to be used on the arable crops. The value of the manure can then be assessed.

The average price of a store beast in this group was £57. 13s. and accounted for 79 per cent. of the total costs. Between the purchase of the store cattle and their sale as fatstock the gain in value averaged £21. per head. The total costs incurred in keeping the cattle during the feeding period averaged £15. per head. The most important items in the costs were hand fed feeding stuffs and grazing. These accounted for 39 per cent. and 36 per cent. respectively of the total costs.

Very little hand fed food was given to the cattle during the summer grazing season. Indeed, it only amounted to $2\frac{1}{2}$ per cent. of the value of the consumption over the entire feeding period. It was pointed out in connection with the costing of the inwintered herds (see page 4) that if the home grown feeding stuffs had been charged at cost of production a reduction in total costs of £1. 6s. per head would have resulted. It seems more reasonable, however, to charge such home grown feeding stuffs at market values. If the cost of production had been substituted for market values the total costs for the outwintered cattle would have been 7s. 8d. per head less.

OUTWINTERED HERDS - AVERAGE COSTS AND RETURNS

Table 5

	16 herds		3 most profitable		Per head 3 least profitable	
	£.	s.	£.	s.	£.	s.
Price of fat animal	77.	19.	85.	3.	88.	3.
Deficiency payments		19.	1.	14.		8.
Credit for manure produced	-		-		-	
TOTAL PRODUCTION	78.	18.	86.	17.	88.	11.
Costs:						
Store animal	57.	13.	54.	10.	70.	5.
Grazing	5.	12.	8.	7.	4.	3.
Feeding stuffs - home grown ¹	5.	3.		3.	10.	1.
- purchased		17.		3.	1.	16.
Labour - manual	1.	4.	1.	4.	1.	10.
- tractor, horse, etc.		5.		4.		7.
Transport - at purchase	16.		1.	14.		8.
- at sale		4.		4.		4.
Market dues - at purchase	1.		-		-	
- at sale		15.	1.	0.		14.
Machinery depreciation		3.		2.		4.
Overheads		7.		7.		8.
Miscellaneous		-		-		-
TOTAL COSTS	73.	0.	71.	15.	90.	0.
NET MARGIN	+ 5.	18.	+ 15.	2.	(-) 1.	9.

¹ At market values

Other items in the costs do not form a large proportion of the total; even the labour cost was only £1. 4s. per head during the feeding period.

Examination of Tables 5, 6 and 7 reveals some of the complexities of the cattle feeding enterprise. Amongst the average results are the following salient points:-

	<u>3 most profitable herds</u>	<u>3 least profitable herds</u>
Average purchase price of store animal	£55.	£70.
Average selling price of fattened animal	£87.	£89.
Price per cwt. when bought	£5. 14s.	£6. 14s.

(continued)

	<u>3 most profit- able herds</u>	<u>3 least profit- able herds</u>
Feeding stuffs inclusive of grazing	£12.	£16.
Value added between purchase and sale	£32.	£18.
Weight when purchased	9½ cwts.	10½ cwts.
Weight when sold	12¾ cwts.	12½ cwts.
Total fattening period	374 days	257 days

Skilful buying and selling seems to be a major factor in achieving the most profitable results. The difference of £15. in average cost of stores between the most profitable and least profitable herds undoubtedly was the foundation of the success of the most profitable ones. (One farmer bought his cattle at £51. per head and sold them at £90). The most profitable herds had been bought in at a lighter weight, the cost of feeding them was £4. per head less, and yet they were sold at higher weights than the least profitable herds. There was a large difference between the period of days that the most profitable and least profitable herds were kept. The average period that the cattle in the most profitable herds were kept was over a year, whereas the least profitable herds were disposed of after just over 250 days. All the cattle in one of the least profitable herds were sold before the end of June but in order to bring them to the finished condition the farmer who owned them had fed so much additional feeding stuffs that the profit was seriously diminished. It would seem that to secure a satisfactory profit outwintered cattle must be brought on quickly without the feeding of additional foods after Spring, or they must be retained until the end of December thus avoiding sale during the Autumn months when prices tend to slump.

OUTWINTERED CATTLE - LENGTH OF FATTENING PERIOD

Table 6

	Days		
	15 herds	3 most profitable	3 least profitable
Autumn grazing	39	74	44
Winter grazing	119	136	129
Summer grazing	153	164	84
TOTAL FATTENING PERIOD	311	374	257

The most profitable herds received less hand fed foods per head than the least profitable ones (see Section VII, page 19). The herd which recorded the highest profit was composed of Welsh Blacks which were

kept on grass all through the Winter and fed about 10 lbs. of hay daily per head. These were the cattle that sold for £90. per head in the following Autumn.

Table 7 summarises the weights at purchase and at sale but it should be borne in mind that the ingoing weights were chiefly the farmers' estimates.

OUTWINTERED CATTLE - ESTIMATED LIVE WEIGHTS

Table 7.

	Per head					
	15 herds		3 most profitable		3 least profitable	
	cwts.	qrs.	cwts.	qrs.	cwts.	qrs.
Weight of store beast	9.	1.	9.	2.	10.	2.
Weight of fat beast	11.	2.	12.	3.	12.	2.
Weight gain	2.	1.	3.	1.	2.	0.

It is interesting to compare the cost of the grazing and hand fed feeding stuffs utilised by the most profitable and least profitable herds to produce a gain of one live hundredweight per head. The most profitable herds attained this gain per head at a cost of £4. On the other hand, it cost £7. 1s. for the least profitable herds to gain one live hundredweight per head. This indicates considerable difference in the efficiency of conversion of grass and feed into meat.

V. COMPARISON OF THE TWO GRASS FATTENING SYSTEMS WITH THE YARD FATTENING SYSTEM

The average results from the two systems of grass fattening have been discussed in the preceding sections, and in this part of the report they will be compared with those obtained from the fattening of cattle in yards¹.

It should be remembered that the cattle totally fattened in yards were sold under the Ministry of Food when fixed prices were still operative. Most of the cattle fattened on grass were sold on a free

¹ Farmers' Report No. 128 - see footnote on page 1.

market. The system showing the highest level of profit was the outwintered group of herds. This was the system where the cost of grazing was highest and the cost for hand fed foods was lowest.

AVERAGE COSTS AND RETURNS FOR THREE SYSTEMS OF CATTLE
FATTENING 1953-54.

Table 8

	Yard fattening	Per head Grass fattening	
		Inwintered	Outwintered
Number of herds	22	10	15
	£. s.	£. s.	£. s.
Price of fat animal (including deficiency payments)	92. 19.	85. 1.	78. 18.
Credit for manure produced	6. 12.	6. 9.	-
TOTAL PRODUCTION	99. 11.	91. 10.	78. 18.
Costs:			
Store animal	69. 16.	64. 12.	57. 13.
Grazing	13.	3. 18.	5. 12.
. Feeding stuffs - home grown ¹	20. 14.	10. 1.	5. 3.
- purchased	8. 0.	2. 2.	17.
Labour - manual	4. 11.	2. 4.	1. 4.
Other costs	2. 16.	2. 19.	2. 11.
TOTAL COSTS	106. 10.	85. 16.	73. 0.
NET MARGIN	- 6. 19.	+ 5. 14.	+ 5. 18.
Cost of grazing and feeding stuffs per cwt. live weight gain	12. 2.	5. 5.	5. 0.
Value of home grown feeding stuffs at cost of production	15. 15.	8. 15.	4. 15.

¹ At market values.

The cattle fattened in yards showed a loss of almost £7. per head despite a credit of £6. 12s. per head being allowed for manure produced in the yards. The inwintered cattle showed a profit of £5. 14s. per head and this also was after an allowance of £6. 9s. per head had been credited for the value of the manure produced in the yards. No calculation was attempted for the value of the manure

dropped on the pasture lands by the outwintered cattle. Nevertheless, the outwintering system produced the highest profit per head (£5. 18s). This system of keeping the cattle on grassland throughout the feeding period would not be a practical proposition on some arable farms where the percentage of land under the plough is high, and where one objective of introducing a cattle feeding enterprise is the production of manure for the arable crops.

The cattle fattened in yards realised a higher average price when sold than those in the other two systems. This was partly because the finished weight of the beasts was greater under this system (see Table 9) but it was also partially due to the cattle being sold at the time of the year when the best prices are obtained.

ESTIMATED LIVE WEIGHT OF CATTLE FATTENED UNDER
THREE SYSTEMS.

Table 9

	Yard fattening		Per head			
			Grass fattening			
			Inwintered		Outwintered	
	cwts.	qrs.	cwts.	qrs.	cwts.	qrs.
Weight of store beast	10.	2.	9.	2.	9.	1.
Weight of fat beast	13.	0.	12.	2.	11.	2.
Weight gain	2.	2.	3.	0.	2.	1.

The outwintered cattle recorded the lowest average sale price of the three systems and it will be noted that the average weight of the finished cattle under this system was considerably lower than for the other two systems.

The average price paid for the store cattle varied between the three systems. The farmers who practised the yard fattening system paid more for forward stores which could be finished quickly - their stores weighed on average one cwt. more than those bought for the other two systems. The cheapest priced stores were those bought for outwintering. In all three systems the ingoing weights of the stores were estimates supplied by the farmers but they should be reasonably accurate.

The yard fattened beasts showed the greatest increase in value during the feeding period. They did not show the largest increase in weight because the feeding period in this group was considerably shorter

than in the other two groups. Of the two grazing systems, the out-wintered cattle increased the most in value during the feeding period, and doubtless this result was influenced by the low price paid for the store animals in this group. The inwintered cattle, however, secured the largest increase in weight of all the three systems.

There was considerable difference between the three systems in the total cost of keeping the cattle from purchase to marketing. The yard fattened cattle cost £37. per head; the inwintered cattle £21. and the outwintered £15. per head.

The grazing costs were highest for the outwintered cattle.

The cost of hand fed feeding stuffs was highest for the yard fattened cattle being almost £29. per head. This compares with only £12. per head for the inwintered group. Recalculation of the home grown feeding stuffs at costs of production (instead of market value) would reduce the hand fed feeding stuffs cost for yard fattened cattle by £5. per head and for the inwintered cattle by only £1. 6s. per head. When the total cost of feeding is considered, i.e. grazing cost plus cost of hand fed feeding stuffs, the yard fattened cattle still show considerably higher costs than the two grass fattening groups. It is £29. per head compared with only £16. for the inwintered cattle, while the outwintered cattle had the low total feeding cost of £12. per head. The inwintered and outwintered cattle were kept on the farm for nearly a year but the yard fattened cattle were only kept for about six months.

The high cost of feeding the yard fattened cattle was not compensated for by a larger live weight increase - see Table 9. Table 8 gives the cost of grazing plus hand fed feeding stuffs "Per hundredweight live weight gain". The yard fattened cattle cost £12. for every hundredweight gained and the comparable figure for the outwintered and inwintered groups was about £5. in each case.

Inwintered cattle made a greater increase in weight than the outwintered ones, and this caused the total costs of grazing and hand fed feeding stuffs to be approximately the same for both groups when expressed in terms of a hundredweight live weight gain.

The yard fattened cattle cost the most for labour of any of the three systems. They cost twice as much for labour per head as the inwintered cattle. The outwintered cattle had a labour cost per head which was only a little more than a fourth the cost for the yard fattened group.

The comparison of the three systems shows that cattle fattened wholly or in part on grass returned a larger profit per head than those totally fattened in yards. However, in the two grass systems the cattle were on the farm for a much longer period than the yard fattened animals, and the capital invested in the store cattle was, therefore, tied up for a longer period.

The periods for which the cattle were kept under the three systems of fattening are shown in Table 10 below. The yard fattened group were kept for an average period of 27 weeks, the inwintered group were on the farm for 47 weeks whilst the outwintered group were kept for 44 weeks.

LENGTH OF TIME CATTLE WERE KEPT ON THE FARMS UNDER
THREE SYSTEMS OF FATTENING.

Table 10

	Yard fattening	Days per head	
		Inwintered	Outwintered
Autumn grazing	19	59	39
Winter feeding	172	131	119
Summer grazing	-	139	153
TOTAL FATTENING PERIOD	191	329	311

It is noticeable from this Table that the yard fattened cattle were in the yards for 25 weeks during the winter period, whereas the inwintered group of cattle only had a 19 weeks period in the yards. The latter group, however, had a further period of 20 weeks outside on grass before being sold off.

Comparison of the Best Farm in Each System

The most successful herd has been selected from each of the three systems of cattle fattening and Table 11 below sets out their results.

When considering the results of the most profitable herd in each system, it should again be borne in mind that only the yard fattened group and the inwintered group received a credit for the value of the manure produced. The outwintered group did not receive

a credit for the value of the manure dropped on the pastures.

AVERAGE COSTS AND RETURNS FROM BEST HERD IN
EACH SYSTEM.

Table 11 Per head

	Best herd from:-					
	Yard fattening		Inwintered		Outwintered	
	£.	s.	£.	s.	£.	s.
Price of fat animal including deficiency payments	86.	8.	77.	19.	89.	15.
Credit for manure produced	4.	13.	5.	0.	-	
TOTAL PRODUCTION	91.	1.	82.	19.	89.	15.
Costs:						
Store animal	60.	10.	49.	0.	51.	0.
Grazing	-		4.	12.	7.	19.
Feeding stuffs - home grown ¹	11.	17.	7.	1.	5.	17.
- purchased	9.	15.	3.	0.	-	
Labour - manual	3.	4.	3.	6.	2.	11.
Other costs	3.	1.	3.	15.	2.	18.
TOTAL COSTS	88.	7.	70.	14.	70.	5.
NET MARGIN	+ 2.	14.	+ 12.	5.	+ 19.	10.
Number of days on farm	141		306		381	
Weight of store beast	10.	0.	8.	0.	9.	0.
Weight gain	1.	3.	3.	2.	4.	0.
Cost of grazing and feeding stuffs per live-cwt. gain	£.	s.	£.	s.	£.	s.
	11.	16.	4.	2.	3.	8.

¹ At market values.

This makes the result obtained by the highest profit herd in the outwintered group even more noteworthy. On a capital investment of £51. per head the farmer owning this herd made £19. 10s. per head profit plus the value of the manure dropped. On the other hand, the best herd in the yard fattened group only secured a profit of £2. 14s. per head after being credited with £4. 13s. per head for

the value of manure produced in the yard. The best herd in the inwintered group also had the benefit of £5. per head for the value of manure produced in the yard, and with the help of this recorded a profit of £12. 5s. per head.

In each of these three best herds the amount paid for the store cattle was much below the average amount paid for the whole group. This suggests that one of the main reasons for achieving the premier position in their group was the skill shown by the farmers who owned the herds in buying the cattle.

It should also be noted, that the weights of store cattle at purchase into these three best herds were lower than the average weights for all the herds in their respective groups. Both the best herd of yard fattened cattle and the best herd of inwintered cattle were Friesians. The best outwintered herd were Welsh Blacks.

The best herd in the yard fattened group cost considerably more per head for grazing and hand fed feeding stuffs than the best herd in each of the other two systems. The best herd in the outwintered group received only hay additional to the grazing (about 14 lbs. per head per day). The 14 lbs. is an estimated figure and in actual fact probably this figure is over-estimated rather than under-estimated.

The best herd under each system recorded a lower cost of grazing and hand fed feeding stuffs per hundredweight live weight gain than the average for its particular system. The best herd in the yard fattened group had to spend £12. on grazing and other feeding stuffs to secure a hundredweight live weight gain, or nearly three times as much as was expended for the best herds in the outwintered and inwintered groups. It is suggested that the farmers owning the best herd in each system were not only skilful in buying their cattle but they also had ability in achieving low feeding costs.

The cattle in the best herd fattened in yards were sold out at good prices. (If the enquiry had taken place in 1955 the prices received from the fattened beasts would have been higher). The best herd of inwintered cattle were not sold at satisfactory prices. Most of them were disposed of in the middle of Autumn when the prices were low. The best herd of outwintered cattle were mostly sold later in the year when a slightly better price was obtained. The animals in the outwintered group's best herd were heavier at the time they were sold than those in the best herds of the other two systems.

VI. ANALYSIS OF GRAZING COSTS

The figures for grazing given above have been on the basis of "cost per beast" but Table 12 below shows costs "per acre of grass".

GRASS COSTS PER ACRE FOR INWINTERED AND
OUTWINTERED HERDS.

Table 12 Per acre

	Inwintered	Outwintered
Total acres	889	973
Labour ¹	£. s.	£. s.
Rent or rental value	6.	8.
Drainage rates	1. 17.	2. 3.
Artificial fertilisers	2.	-
Spray or dust	1. 5.	19.
Fencing	1.	-
Ley establishment	5.	5.
Machinery depreciation	2.	2.
Manurial residues	1.	1.
Miscellaneous	+ 6.	+ 2.
TOTAL	-	-
	4. 5.	4. 0.

¹ Including manual, horse, tractor and contract work.

There was not much difference in the cost per acre between the two systems. In each case the largest item of cost was rent. Fertilisers accounted for about a quarter of the total costs. The grass that was not grazed during the winter months received larger applications of artificials than that grazed by the outwintered stock.

Grazing costs have been allocated according to the number of days grazing by each class of stock using each field. A bullock or cow grazing for 24 hours on a field has been taken as one grazing day in summer or half a grazing day in winter. Six breeding sheep have been estimated to require as much feed as a bullock and to account for one grazing day (see Appendix I. p. 26). The total grazing costs are divided by the total number of grazing days to arrive at a daily

grazing cost. This result can then be used to estimate the share of grazing by each class of stock using a field. The average cost per grazing day was 5 $\frac{1}{2}$ d. for the inwintered herds and 5d. for the outwintered.

VII. HAND FED FOODS

The average quantities of feeding stuffs other than grass supplied per head to the cattle are shown in Table 13. The figures cover the foods supplied to the animals during the Winter. As mentioned on page 5, a small proportion of the total hand fed foods was given during the Summer but this has been excluded from the Table.

TYPES AND QUANTITIES OF FOODS OTHER THAN GRASS GIVEN TO INWINTERED AND OUTWINTERED CATTLE DURING THE WINTER PERIOD, WITH TOTAL NUTRITIONAL VALUES

Table 13	Per head	
	Inwintered	Outwintered ¹
Home grown:	cwts.	cwts.
Barley	0.1	-
Oats	0.4	0.2
Mixed corn	0.4	-
Beans	0.1	-
Mangolds	11.5	4.1
Fodder beet	0.1	-
Potatoes	0.3	-
Kale	4.7	-
Meadow hay	2.9	5.7
Seeds hay	13.0	6.3
Silage	0.3	1.2
Straw	3.9 ²	5.5
Threshed ryegrass	0.4	-
Chaff	2.0	-
Purchased:		
Sugar beet pulp	1.2	0.3
Cattle cakes	0.1	0.4
Analysis:	lbs.	lbs.
Dry matter	2,624	1,876
Starch equivalent	909	625
Protein equivalent	119	75

¹ Excluding grazing.

² Excluding straw for bedding.

Both groups of herds were maintained chiefly on home grown feeding stuffs but they did receive some purchased sugar beet pulp. The inwintered cattle were fed more roots and hay than the other group, and they also received about one cwt. per head of home grown cereals and one cwt. of sugar beet pulp. In addition to grass the outwintered cattle were given hay, silage, straw and roots but they received in this way only about two thirds of the starch and protein received by the inwintered cattle.

It has not been possible to calculate the nutrients used to obtain a hundredweight live weight gain as the live weight gain during the winter feeding period is not known.

QUANTITIES AND ANALYSIS OF FEEDING STUFFS GIVEN TO EACH BEAST PER DAY, WINTER PERIOD ONLY - INWINTERED CATTLE.

Table 14

	Per head per day		
	10 herds	3 most profitable	3 least profitable
Home grown:	lbs.	lbs.	lbs.
Cereals and beans	0.9	0.1	1.3
Roots	10.2	0.3	15.5
Kale	4.0	-	8.8
Hay	13.6	10.5	15.2
Silage	0.2	0.7	-
Straw and chaff ¹	5.3	11.8	-
Purchased:			
Sugar beet pulp	1.0	0.1	2.4
Cattle cakes	0.1	0.1	0.1
Analysis:			
Dry matter	20.0	19.6	19.5
Starch equivalent	6.9	4.4	8.6
Protein equivalent	0.9	0.5	1.2

¹ Excluding straw for bedding estimated at 14 lbs. per head per day.

Inwintered cattle were fed only half as much starch and protein as the cattle finished in yards¹ which received 1,797 lbs. of starch equivalent and 275 lbs. of protein equivalent per head.

¹ Farmers' Report No. 128.

The average quantities of feeding stuffs supplied during the winter feeding period to the inwintered cattle are shown in Table 14. On average they received 2 lbs. of concentrates, 14 lbs. of roots and kale, 14 lbs. hay and 5 lbs. of straw. The quantity of straw consumed is an estimate arrived at by deducting an estimate of the amount utilised for bedding from the total quantity used. The estimate of the dry matter fed to the cattle is a rather low figure so it is probable that the cattle ate more straw than is shown.

It is estimated that the inwintered cattle received an average of 7 lbs. of starch equivalent and nearly 1 lb. of protein equivalent per head per day. The standard maintenance requirement of animals weighing between 9 and 10 cwts. is¹:-

	<u>Lbs. per head per day</u>
Dry matter	29 $\frac{1}{2}$
Starch equivalent	6 $\frac{1}{2}$
Protein equivalent	1 $\frac{1}{2}$

The most important feature of the table is the evidence it provides of the different levels of feeding for the most profitable herds compared with the least profitable herds. The herds that showed the best profits had been fed scarcely any concentrates.

The outwintered cattle are shown by Table 15 to have received smaller quantities of hand fed feeding stuffs. They averaged per head per day one lb. of concentrates, 11 lbs. of hay, 5 lbs. of straw and a few roots.

The three most profitable outwintered herds were only fed 14 $\frac{1}{2}$ lbs. per head per day of hay, straw, and chaff, and for the rest of their maintenance they grazed the pastures on which they were outwintered. The three least profitable herds had received per head per day very considerable quantities of feed - almost 3 lbs. of concentrates, 18 lbs. roots, 12 lbs. of hay and 8 lbs. of straw.

¹ Ministry of Agriculture and Fisheries. "Rations for Livestock." 1954 edition. Bulletin No. 48. H. M. Stationery Office, London, S.E.1.

QUANTITIES AND ANALYSIS OF FEEDING STUFFS GIVEN TO EACH BEAST PER DAY, WINTER PERIOD ONLY¹ - OUTWINTERED CATTLE.

Table 15

	Per head per day		
	15 herds	3 most profitable	3 least profitable
Home grown:	lbs.	lbs.	lbs.
Cereals and beans	0.2	-	1.3
Roots	3.9	-	17.6
Kale	-	-	-
Hay	11.3	8.5	11.8
Silage	1.2	-	-
Straw and chaff	5.2	6.0	7.7
Purchased:			
Sugar beet pulp	0.3	-	1.1
Cattle cakes	0.4	-	0.4
Analysis:			
Dry matter	15.8	12.5	21.4
Starch equivalent	5.2	3.4	5.3
Protein equivalent	0.6	0.4	0.8

¹ Excluding grazing.

If they had been inwintered without access to any grazing these quantities would have been sufficient for their maintenance.

SUMMARY

1. This report presents information collected from 10 herds wintered in yards and fattened on grass, and from 15 herds outwintered and fattened on grass.
2. The inwintered herds recorded a loss of 15s. 0d. per head, whereas the outwintered herds showed a profit of £5. 18s. per head. In both cases the results are exclusive of the value of manure produced.
3. The farmers inwintering cattle paid more for their store beasts than the farmers who practised outwintering. The cost of inwintering proved to be higher than the cost of outwintering. The difference between purchase price and sale price was lower with the inwintered herds than with the outwintered ones, the figures being £20. 9s. and £21. 5s. per head respectively.
4. Total costs for the inwintered cattle (exclusive of the cost of the store beast) amounted to £21. 4s. per head. Feeding stuffs accounted for £12. 3s. and grazing costs to almost £4. per head. Labour costs for this group were low.
5. Total costs for the outwintered cattle (exclusive of the cost of the store beast) amounted to £15. 7s. per head. Of this sum £6. was incurred for feeding stuffs and £5. 12s. in grazing costs. In this group the labour costs were again low.
6. In each system of fattening the farmers who obtained a high profit paid below the average price for their store cattle, and they secured a good increase in value between purchase and sale. The farmers with the highest profits also had low feeding costs.
7. A comparison of these two systems of grass fattening with the alternative practice of fattening entirely in yards shows that grass fattening is more profitable.
8. The inwintered cattle were fed on concentrates, roots, kale, etc. and on average they had per head per day 6.9 lbs. of starch equivalent and 0.9 lbs. of protein equivalent.

9. The outwintered cattle also received concentrates, roots, silage and other feeding stuffs which provided on average per head per day 5.2 lbs. of starch equivalent and 0.6 lbs. of protein equivalent.
10. In both groups the cattle which yielded the highest profit received less nutrients than average.

A P P E N D I X I

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

- (1) Overheads were calculated for each record on the basis of 5s. 0d. for each £. of direct manual labour.
- (2) Hedging and ditching - a standard charge of 5s. 0d. per acre was allowed.

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:-

	<u>At market price</u>			<u>At cost of</u>		
	<u>(per ton)</u>			<u>production (per</u>		
	£.	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 ¹	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.	5.	17.	0.
Seeds hay (loose in rick)	5.	17.	0.	5.	17.	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		-			-	

¹ For ration consisting of two fifths barley, two fifths oats and one fifth beans.

CONVERSION OF DEADWEIGHTS TO LIVeweIGHTS

The killing-out percentage was taken at an average of 57 per cent.

GRAZING COSTS

The costs of grazing (rent, cultivation, fertiliser applications, hedging, ditching, etc.) were allocated to the cattle in the enquiry according to the proportion of days grazing to the total number of livestock grazing days (cow equivalents) for the field.

	<u>Livestock Unit</u>
Cattle over 2 years	1
Cattle 1-2 years	$1\frac{1}{2}$
Cattle under 1 year	$1\frac{1}{3}$ rd
Breeding sheep	$1\frac{1}{6}$ th
Other sheep	$1\frac{1}{10}$ th
Horses	1

A winter grazing day was counted as half a normal grazing day.

When one hay crop was taken - $\frac{1}{3}$ of costs to livestock.

When two hay crops were taken - $\frac{1}{6}$ of costs to livestock.

MANURIAL RESIDUES

The residual debit or credit was reached by deducting any residues chargeable from previous crops from the sum of residues to be credited to the present crop.

The residual value of fertilisers was calculated according to the tables in "Residual Values of Fertilisers and Feedingstuffs" Sixth Report (1954) of the Scottish Standing Committee, Department of Agriculture for Scotland. No manurial residues were allowed to farmyard manure.

The charge for lime was spread equally over four years.

LEYS

The costs of establishment were spread equally over four years.

A P P E N D I X II

AVERAGE COSTS AND RETURNS FOR INDIVIDUAL FARMS, 1953-54

Farm code No.	Cost of store	Increase in value from purchase to sale	C O S T S		
			Grazing	Home grown feeding stuffs	Purchased feeding stuffs
<u>CATTLE WINTERED IN YARDS AND FATTENED ON GRASS</u>					
	£. s.	£. s.	£. s.	£. s.	£. s.
27	49. 0.	28. 19.	4. 12.	7. 1.	3. 0.
45	66. 19.	22. 11.	3. 0.	6. 12.	1. 17.
42 A	53. 4.	22. 10.	7. 2.	7. 14.	-
41	54. 11.	16. 6.	3. 0.	6. 2.	1. 3.
30 A	62. 3.	21. 16.	2. 8.	12. 19.	-
9	67. 10.	24. 2.	3. 15.	11. 7.	3. 7.
33 A	71. 10.	14. 19.	2. 9.	9. 18.	-
8	59. 19.	20. 4.	5. 2.	12. 10.	1. 9.
24 A	62. 0.	15. 11.	5. 18.	8. 16.	4. 0.
6	75. 0.	15. 4.	3. 13.	13. 17.	5. 3.
<u>CATTLE OUTWINTERED ON GRASS AND FATTENED ON GRASS</u>					
44 A	51. 0.	38. 15.	7. 19.	5. 17.	-
44 B	51. 7.	30. 18.	3. 10.	-	5. 9.
32	57. 10.	31. 7.	8. 3.	6. 0.	5.
39	48. 13.	24. 16.	4. 2.	7. 10.	1. 5.
33 B	64. 0.	23. 7.	6. 11.	17.	3. 7.
40	54. 15.	21. 9.	4. 2.	5. 3.	-
48	64. 16.	13. 6.	2. 3.	2. 14.	-
34	68. 4.	20. 0.	2. 14.	6. 9.	2. 14.
35	51. 15.	18. 11.	4. 5.	4. 10.	1. 9.
30 B	66. 5.	18. 8.	2. 11.	5. 6.	1. 9.
42 B	52. 0.	21. 1.	10. 1.	4. 3.	-
33 C	67. 5.	19. 10.	5. 7.	6. 13.	-
28	66. 5.	18. 3.	2. 13.	10. 14.	-
31	73. 0.	21. 5.	5. 2.	10. 17.	3. 1.
24 B	73. 18.	15. 7.	5. 13.	7. 19.	3. 7.

A P P E N D I X II

AVERAGE COSTS AND RETURNS FOR INDIVIDUAL FARMS, 1953-54

C O S T S			£. per beast		
Labour	Other	Total costs	Profit	Value of manure produced	Net margin with credit for manure
£. s.	£. s.	£. s.	£. s.	£. s.	£. s.
3. 6.	3. 15.	21. 14.	7. 5.	5. 0.	12. 5.
1. 15.	2. 4.	15. 8.	7. 3.	5. 8.	12. 11.
1. 16.	3. 0.	19. 12.	2. 18.	8. 0.	10. 18.
1. 2.	2. 7.	13. 14.	2. 12.	5. 0.	7. 12.
3. 1.	2. 12.	21. 0.	16.	5. 13.	6. 9.
2. 1.	3. 2.	23. 12.	10.	6. 0.	6. 10.
3. 0.	2. 2.	17. 9.	- 2. 10.	6. 11.	4. 1.
2. 8.	3. 14.	25. 3.	- 4. 19.	7. 18.	2. 19.
3. 13.	3. 11.	25. 18.	-10. 7.	7. 0.	- 3. 7.
2. 15.	3. 6.	28. 14.	-13. 10.	6. 17.	- 6. 13.
2. 11.	2. 18.	19. 5.	19. 10.	-	19. 10.
5.	3. 19.	13. 3.	17. 15.	-	17. 15.
1. 7.	3. 9.	19. 4.	12. 3.	-	12. 3.
1. 10.	1. 9.	15. 16.	9. 0.	-	9. 0.
15.	3. 4.	14. 14.	8. 13.	-	8. 13.
2. 4.	2. 6.	13. 15.	7. 14.	-	7. 14.
8.	1. 15.	7. 0.	6. 6.	-	6. 6.
1. 10.	1. 16.	15. 3.	4. 17.	-	4. 17.
1. 0.	2. 14.	13. 18.	4. 13.	-	4. 13.
1. 15.	2. 17.	13. 18.	4. 10.	-	4. 10.
14.	2. 11.	17. 9.	3. 12.	-	3. 12.
2. 17.	2. 12.	17. 9.	2. 1.	-	2. 1.
1. 7.	2. 19.	17. 13.	10.	-	10.
1. 0.	1. 8.	21. 8.	- 3.	-	- 3.
2. 5.	2. 4.	21. 8.	-6. 1.	-	- 6. 1.

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