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REPORT

on

COSTS OF CATTLE PRODUCTION

1962-63

by

J. A. MACLENNAN, B.Sc.

THE EDINBURGH SCHOOL OF AGRICULTURE
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DEPARTMENT OF ECONOMICS

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FOREWORD

The data studied in this report brings out several important aspects in relation to cattle in the economy of feeding farms in the south-east of Scotland. Broadly speaking, the data confirm the widely accepted view that the winter feeding of the heavier categories of store cattle is not profitable in the narrow accounting concept. On the other hand, the feeding of speaned calves sold fat at lighter weights appears to offer a reasonable prospect of a profit per head; the same applies to Friesian calves carried to fairly heavy weights. The fattening of stores off the grass appears to be reasonably profitable in respect of both the heavier and lighter categories of stores. Behind these broad statements lie all the factors which have to be taken into account by the farmer when deciding to feed cattle - what type of cattle will he handle, at what period of the year will they be sold, how will the cattle fit into the overall economy of the farm and what his feeding practice will be.

In making his decision the farmer must take into account his probable realisation price on the one hand and his costs on the other. As far as the former is concerned he still has a fairly high degree of certainty provided by the guaranteed price system even subject to the modifications introduced by the 1964 Price Review and to the fact that local market prices are subject to fairly wide fluctuations. Against the potential realisation prices which he may expect the farmer has to place his costs. These may be considered under two broad headings - the cost of feeding and the cost of the store beast. If, for example, the objective is a 10 cwt. fat beast at a particular period this will entail starting off months earlier with a store beast at a lighter weight. The costs of feeding will represent the cost of putting on the additional weight at so much per cwt. liveweight gain and this cost, compared with the probable selling price, will indicate the likely profit or loss on the actual feeding. The cost of the store beast at so much per cwt. can also be compared with the probable selling price per cwt. and should not be higher if a loss is to be avoided.

The data in the report indicate that there are wide variations in the profitability of feeding cattle either in the courts or off the grass. The fact that profits can be made even from the winter feeding of heavy stores indicates that sound feeding practices or shrewd buying (where both cost per cwt. and the quality of the store beast are important) or both are the basic elements in the efficiency of cattle enterprises on feeding farms. Where the farmer's own feeding costs are high relative to his expected realisation values or he is faced with high buying (or rearing) costs he may have to consider the real necessity of continuing to feed cattle as an integral part of his farming system or to modify his system to include some alternative livestock enterprise or to introduce some more radical change in his overall farm policy.

All these considerations require the careful assessment of costs and prices which can be done only by the farmer in the light of his own conditions. The data in this report give some broad indications of the possibilities under different systems of management and emphasize the factors concerned. In particular the "Gross Margin" data can be helpful when any change in farm policy is being considered.

J. D. Nutt,
Advisory Economist.

I INTRODUCTION

This report gives the results of an investigation into the costs and returns from the feeding of store cattle in the courts and on the grass in the East of Scotland during 1962/63.

Most of the enterprises were on arable and feeding farms, a small number on stock-rearing and feeding farms and one on a dairy farm. The general policy for the feeding of cattle on arable farms is to purchase stores weighing from eight to ten cwt. in two lots, one in the late summer or autumn for court feeding and the other about six months later in the early months of the year, just prior to the start of full grazing in April. This type of store, though acknowledged to leave little or no profit when court fed is considered ideal for consuming the feeding crops and feed by-products of the rotation such as tail-corn, straw, sugar beet tops and brock potatoes. When fed off the grass they leave a satisfactory profit per head and are also regarded as an ideal complement to the other categories of livestock in good grassland management.

In recent years, however, many arable farmers have found it more profitable to feed speaned calves in the courts rather than the larger type of store. As a result there has been a marked increase in the number of the lighter type of animal being fattened.

II THE SAMPLE

Altogether 49 farmers co-operated in the investigation supplying records for 109 enterprises, 73 being court fed and 36 on the grass. It was only possible to cost all the feeding cattle on about half the farms in the sample, either as a whole or as separate enterprises. Only sample lots were studied on the remainder.

a) Court Feeding Both the heavier stores and the speaned calves have been divided into sub-groups for the purpose of more detailed examination. The former group has been divided into two lots - those with an initial live-weight of 7-9 cwt. and those over 9 cwt. per head. The lighter cattle comprised 22 lots, totalling 984 head, mainly Shorthorn or Aberdeen Angus crosses of Irish origin. The heavier cattle comprised 19 lots totalling 1538 cattle of similar types. The speaned calves have been divided into three lots - two groups of cross Shorthorn or Aberdeen Angus calves, 19 lots totalling 515 head being sold fat, 8 lots totalling 383 head sold as stores and one smaller group of 5 lots of Friesian calves totalling 174 head sold fat. All the speaned calves were either bred or reared on the farm or purchased from other rearers.

b) Grass Feeding The stores fattened on the grass were divided into two size groups, those with initial weights of 7½ cwt. and over and those under that weight. The heavier stores which were predominantly Irish crosses of the Shorthorn and Aberdeen Angus breeds consisted of 20 lots totalling 797 cattle. In contrast, the smaller stores were all home-bred, a small proportion being bred and reared on the farm, and were mainly crosses of the Shorthorn and Aberdeen Angus breeds. The number of these enterprises was 16 and the total number of cattle 365.

III COURT FEEDING/

III COURT FEEDING:

Costs, Returns, Profits

a) Stores, exceeding 9 cwt. Most of these stores were purchased more or less regularly from August to November inclusive, the price per cwt. being lowest in November, £7.14s. and highest in September and October, when they averaged £8 per cwt. Twenty three per cent of the total numbers fed had been put to the grass in the previous April, costing £8 per cwt. at that time. Sales of finished cattle were fairly even during the six months December to May inclusive, the peak months being in February and April with 18% and 24% respectively of the total numbers sold fat. Over this period of six months the price per cwt. liveweight (including deficiency payments) rose from £8.1s. in February to £9 in May (for patterns of purchases and sales of all the groups of enterprises studied see Appendices III and IV.

b) Stores, from 7-9 cwt. In contrast to the extended buying period of the larger stores those in this group were purchased mainly in two lots, September (33%) and October (30%), costing £7.19s. and £8.9s. per cwt. liveweight respectively. As was the case for the larger sized stores, nearly one quarter of the total numbers (24%) had been on the farm since the previous April when the average cost was £7.18s. per cwt. The greatest proportion of the sales took place from January to April, prices rising by 4s. per cwt. from £8.12s. per cwt. in January to £8.16s. in February, then falling to £8.15s. per cwt. in March and April.

The costs, returns and profits per head for the two groups of stores are given in Table I. A comparison shows the heavier stores over 9 cwt. to have sustained a loss of 4s.7d. per head and that the group of lighter stores made a profit of 15s.6d. per head. Their relative performances can best be assessed by comparing the results for each group according to:- a) the store cost per cwt.; b) the realisation price per cwt. liveweight (including deficiency payment); c) the daily liveweight gain per head and d) the cost per cwt. liveweight gain. These have been shown in the lower section of the table.

It may be seen that the heavier animals cost much less per cwt. liveweight as stores - £7.14s.6d. as against £8.1s.11d. for stores of the other group - a difference of 7s.5d. per cwt. in favour of the heavier type. These, however, did not realise such a good price per cwt. as the lighter type - £8.9s. as against £8.16s.5d., a difference of 7s.5d. per cwt. That is, the differences between the average buying and selling prices for the two groups were similar. It may also be seen that although the daily liveweight gain per head was similar for both groups - 1.49 lb. and 1.51 lb. respectively, the consumption of concentrates per head per day for the lighter group was lower by .44 lb.* This suggests that the heavier stores exceeding 9 cwt. did not respond so well to the feeding of concentrates as did the lighter ones weighing from 7-9 cwt. The higher rate of consumption of concentrates per lb. liveweight gain for the heavier stores is reflected in their higher cost per cwt. liveweight gain - £13.4s.11d. as against £12.3s.5d. for the lighter type. This ability of lighter stores to fatten more cheaply than the heavier, as will be shown later in the report, is one of the chief advantages that speaned calves have over the more traditional heavier type of store.

c) Speaned Calves/

*Average rations for all the groups of enterprises studied are given in Appendix II.

TABLE I COSTS AND RETURNS PER HEAD FROM COURT FEEDING

Type of Store	Heavy over 9 cwt.	Light 7-9 cwt.
	£ s. d.	£ s. d.
Average Cost per Head Store Animal	75 18 8	67 13 6
Gross Food Costs Home Grown	12 17 4	12 2 5
Purchased	4 3 3	2 19 10
Total Gross Food Costs	17 - 7	15 2 3
Less Residual Man. Values	1 5 8	- 15 -
Total Net Food Costs	15 14 11	14 7 3
Labour	2 7 7	2 12 -
Sundries (incl. overheads & power)	2 2 10	2 5 5
Total Net Feeding Costs	20 5 4	19 4 8
Total Cost	96 4 -	86 18 2
Realisation Price*	95 19 5	87 13 8
Net Profit	- - -	£ - 15 6
Net Loss	£ - 4 7	- - -
General Performance Data: Averages		
Liveweight - store	9.83 cwt.	8.36 cwt.
Liveweight - fat	11.36 "	9.94 "
Liveweight - gain	1.53 "	1.58 "
Feeding period	115 days	117 days
Concentrates per head per day	6.21 lb.	5.77 lb.
Liveweight gain per head per day	1.49 lb.	1.51 lb.
Feeding cost per cwt. liveweight gain	£13 4 11	£12 3 5
Store cost per cwt. liveweight	£ 7 14 6	£ 8 1 11
Realisation price per cwt. liveweight*	£ 8 9 -	£ 8 16 5

*Includes deficiency payments.

c) Speaned Calves The great majority of the speaned calves were either purchased or transferred (if own bred) from the breeding herd in October. Buying prices in this month averaged £8.1s. per live cwt. for the cross calves sold fat, £9.2s. for the cross calves disposed of as stores and £7.11s. per cwt. for the Friesian calves. In November the buying price for cross calves to be fattened, rose sharply to £10.13s. per cwt. but in contrast to this, the buying prices of the other categories of calves fell to £7.12s. for crosses and £6.7s. for Friesians. These variations in buying prices illustrate the effects of such factors as the quality of the calf, the time of purchase and the conditions affecting supply and demand in particular markets at particular times.

The pattern of sales for the two groups of cross calves shows that April and May were the most common months. In April prices were £9.8s. per cwt. for both groups and in May, although the price per cwt. of those sold fat remained the same, the price per cwt. for those sold as stores rose by 7s. to £9.15s. March and April were the most popular months for the sale of Friesians but, in contrast to the prices for the groups of crosses of the beef breeds, these showed a much wider fluctuation rising from £8.12s. in March to £9.10s. in April.

The average profits per head earned by each of the two groups sold fat, given in Table II, show a big improvement over those for the heavier stores. The Friesians earned the greatest profit - £11.15s. per head. The cross stores showed a profit of £6.15s.8d. per head and the average profit for the speaned calves sold as stores was £1.15s.9d. per head. It may be noted from the figures in the section showing the performance data that the Friesians made the best average daily liveweight gain of the three groups. This was 2.01 lb. compared to 1.75 lb. for the crosses of the beef breeds sold fat and 1.41 lb. for crosses of the same type sold as stores. It may be seen that the better daily liveweight gains made by the Friesians can be attributed largely to a higher rate of concentrates fed - 12.83 lb. per head per day compared to 5.26 lb. and 5.04 lb. for the other groups. These figures suggest that perhaps the Friesians were too intensively fed, especially considering the fact that they showed an additional gain of only .26 lb. liveweight per head per day for an additional 7.57 lb. per head per day of concentrates fed. It is also interesting to note that the crosses of the beef breeds sold fat consumed only .22 lb. more concentrates per head per day than those sold as stores, yet made a better daily liveweight gain, better by .34 lb. These figures stress the importance of selecting the right type of speaned calf for intensive fattening in the courts.

As might have been expected, the Friesians had an appreciably greater cost per cwt. liveweight gain than had crosses of the beef breeds sold fat - £9.12s.9d. as against £8.3s.7d. For crosses of the beef breeds sold as stores the cost per cwt. liveweight gain was £9.11s. These costs per cwt. liveweight gain may be compared with the much higher figures for the heavier stores.

It may be seen from the performance data in Table II that the great advantage the Friesians had over the beef crosses was a relatively low cost per cwt. of the store beast. This was £6.19s.8d. as against £8.15s. per cwt. (the 1961/62 figures showed a similar difference). This however may not be a permanent advantage as it depends to a large extent on a supply/

TABLE II SPEANED CALVES FED IN COURTS

COSTS AND RETURNS PER HEAD

Item	Sold Fat		Sold as Stores
	Aberdeen Angus and Shorthorn Crosses	Friesians	Aberdeen Angus and Shorthorn Crosses
	£ s. d.	£ s. d.	£ s. d.
Average Costs			
Store Animal	46 6 7	41 10 5	42 - 10
Gross Feeding Cost	21 6 2	32 - 6	21 7 4
Less Residual Man. Values	1 3 9	1 11 4	1 4 1
Net Feeding Cost	20 2 5	30 9 2	20 3 3
Total Cost	66 9 -	71 19 7	62 4 1
Realisation Price*	73 4 8	83 14 7	63 19 10
Net Profit	£ 6 15 8	£11 15 -	£ 1 15 9
Performance Data: Averages			
Liveweight - store	5.28 cwt.	5.94 cwt.	4.80 cwt.
Liveweight - fat	7.74 "	9.10 "	6.91 "
Liveweight - gain	2.46 "	3.16 "	2.11 "
Feeding period	157 days	176 days	167 days
Concentrates per head per day	5.26 lb.	12.83 lb.	5.04 lb.
Liveweight gain per head per day	1.75 lb.	2.01 lb.	1.41 lb.
Feeding cost per cwt. liveweight gain	£ 8 3 7	£ 9 12 9	£ 9 11 -
Store cost per cwt. liveweight	£ 8 15 7	£ 6 19 8	£ 8 15 2
Realisation price per cwt. liveweight*	£ 9 9 2	£ 9 4 -	£ 9 5 2

*Includes deficiency payments

supply of relatively cheap Friesians at about three weeks of age for rearing to speaning age on the farm. Recent increases in the prices of these calves suggest that this advantage has now been reduced considerably. It may also be observed that this low initial cost per cwt. for Friesians meant that they had by far the most favourable balance between store costs and selling prices per cwt. liveweight. This was £2.4s.4d. per cwt. as against 13s.7d. per cwt. and 10s. per cwt. for crosses of the beef breeds sold fat and as stores respectively.

These latter two sets of figures may be compared with the difference of 14s.6d. per cwt. for each of the two groups of heavier stores of the same type. The advantage of a more favourable balance between buying and selling prices per cwt. liveweight therefore lay with the larger stores. On the other hand, based on average figures, the larger stores had a slightly lower daily liveweight gain per head and a decidedly higher cost per cwt. liveweight gain than had the speaned calves. The respective figures were 1.50 lb. liveweight gain per head per day and £12.14s.2d. per cwt. liveweight gain for the groups of heavier stores and 1.58 lb. per head per day and £8.17s.1d. per cwt. liveweight gain for the speaned calves. It may be concluded, therefore, that the chief factor affecting profitability between the heavier stores and the speaned calves was the lower cost per cwt. liveweight gain of the latter.

IV FACTORS AFFECTING PROFITABILITY

It may be seen in Table III(a), which sets out the distribution of profits and losses for the two groups of heavier stores, that almost equal proportions in each group sustained losses as made profits. The distributions also show that in each group about half the total number of enterprises made either good profits or heavy losses. Thus a large proportion of the total enterprises must have been influenced by marked differences in the factors affecting profitability. By contrast the distribution of profits and losses of the speaned calves given in Table III(b) shows that most of the enterprises made profits.

In order to examine how the factors affecting profits varied with extremes of profitability, the results for the four most and four least profitable lots in the group of stores exceeding 9 cwt. have been shown in Table IV. It can be seen that the stores in the four most profitable lots not only cost 8s. per cwt. less to buy but sold for 15s.10d. more per cwt. liveweight. This gave them an overall advantage between the buying and selling prices of £1.3s.10d. per cwt. liveweight. These figures not only stress the importance of timing the dates of sales to ensure the maximum price per cwt. liveweight but also of ensuring that excessive prices are not paid per cwt. liveweight when buying to enable a satisfactory profit to be earned (the weighing of stores is essential in this respect). The more profitable stores also made better daily liveweight gains - 2.05 lb. per head per day as against 1.74 lb. for the least profitable lots. This was achieved by feeding a higher rate of concentrates per head per day - greater by 2.42 lb. It may be noted in this respect that the increased rate of concentrates fed did not result in an increase in the cost per cwt. liveweight gain which was lower for the most profitable lot by £1.1s.1d. per cwt. These figures suggest that, even for the larger stores, it is economic, up to a point, to feed relatively large amounts of concentrates per head per day. It is essential, however, to ensure that the more intensive feeding does not lead to excessive fatness and hence a reduced carcase quality and a lower sale price per cwt. liveweight.

V BUILDING DESIGN, LABOUR EFFICIENCY AND PROFITABILITY/

TABLE III COURT FED CATTLE
DISTRIBUTIONS OF PROFITS AND LOSSES

a) Larger Stores

Store Weight	Losses per Head: £4 and over	Losses per Head: £2-£4	Losses per Head: up to £2	Profits per Head: up to £2	Profits per Head: £2-£4	Profits per Head: £4 and over	Total Enterprises
Over 9 cwt.	6	1	2	5	3	3	20
7-9 cwt.	5	3	2	3	2	4	19

b) Speaned Calves

Type		Losses per Head: £8-£16	Losses per Head: up to £8	Profits per Head: up to £8	Profits per Head: £8-£16	Profits per Head: £16 and over	Total Enterprises
Fat	Shorthorn, Aberdeen Angus XS	1	3	6	6	3	19
	Friesians	-	-	1	3	1	5
Stores	Shorthorn, Aberdeen Angus XS	1	2	4	1	-	8

TABLE IV FOUR MOST AND FOUR LEAST PROFITABLE ENTERPRISES
A COMPARISON OF PERFORMANCE DATA

	Stores over 9 cwt.	
	Four Most Profitable Enterprises	Four Least Profitable Enterprises
Weight of store	9.76 cwt.	9.96 cwt.
Weight of fat animal	11.56 "	11.39 "
Liveweight gain	1.80 "	1.43 "
Feeding period	98 days	92 days
Concentrates per head per day	7.46 lb.	5.04 lb.
Liveweight gain per head per day	2.05 lb.	1.74 lb.
Feeding cost per cwt. liveweight gain	£13.19s.6d.	£15. -s.7d.
Store price per cwt. liveweight	£ 7.11s.-d.	£ 7.19s.-d.
Realisation price per cwt. liveweight	£ 8.19s.8d.	£ 8. 3s.10d.

V BUILDING DESIGN, LABOUR EFFICIENCY AND PROFITABILITY

Most of the enterprises were housed in old farm buildings which had received little or no major alterations to improve the cattleman's efficiency. In this type of building a cattleman working eight hours per day and receiving assistance with the bedding at week-ends was estimated to be able to look after about 100 cattle. The range varied from 80 to 120 cattle depending on the lay-out of the buildings. In contrast, the average number looked after by the cattleman in new buildings specially designed to increase labour efficiency was 150 cattle. This offers the possibility of reducing labour costs per head by as much as one third; this is confirmed by the average labour costs in old and new buildings. These were 12s.8d. and 8s.8d. per head per month respectively - a saving of 4s. per head in favour of the latter type. This saving was, however, offset by a charge for depreciation plus the cost of operating the mechanical trolleys for transporting the rations. These extra costs amounted to 3s. per head per month giving a net saving in cost of 1s. per head in favour of the new type of building. An additional charge would also have to be made for interest on capital invested in the new buildings. As this was estimated to be 1s.6d. per head per month the total labour, depreciation and interest charges for both types of buildings was thus about the same. On the basis of these costs there would thus be no advantage in housing cattle in specially designed buildings. However, from the point of view of maximising profits in relation to the labour employed and provided there was a sufficient supply of home-grown forage crops, a new type of building, by increasing turnover could also increase total profits. This could be the case with quite a large proportion of the enterprises that sold fattened speaned calves and a smaller proportion of those that sold them as stores. In the case of the enterprises that fed the heavier cattle, however, there would be less possibility of increasing total profits to any extent, apart from the relatively small proportion of enterprises earning the better levels of profits of £2 per head and over.

VI GRASS FATTENING:

Costs, Returns, Profits

Most of the larger stores weighing 7½ cwt. and over that were purchased for fattening on the grass were bought in March and April, the respective costs per cwt. being £8.6s. and £7.19s. However, by far the greatest number of stores were animals that had been carried through the winter in the courts on the same farms. These accounted for 38% of the total fat cattle sold and cost £8.7s. per cwt. liveweight in October 1962. The large majority of these cattle were sold in June, July and August, the price per cwt. liveweight being highest in June, £9.6s. falling to £8.3s. in August. The pattern of purchases and sales of the stores under 7½ cwt. was, in contrast, quite different. Eighty-eight per cent of the total number fattened were those that cost £8.15s. per cwt. in October 1962. The remaining 12% were purchased in April and May in equal numbers costing £11 and £9.3s. per cwt. liveweight respectively. The pattern of sales shows that these were fairly regular from June to October, prices over the period falling from a relatively high £9.17s. per cwt. in June to £8.5s. per cwt. in October (for patterns of purchases and sales see Appendices III and IV).

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TABLE V COSTS AND RETURNS FROM GRASS FATTENING LARGE AND SMALL STORES COMPARED

Item	Shorthorn and Aberdeen Angus Crosses	
	Stores 7½ cwt. and over	Stores under 7½ cwt.
	£ s. d.	£ s. d.
Average Costs		
Store Animal	77 15 3	58 18 -
Grazing	3 3 2	2 5 3
Gross Feeding Stuffs	- 5 11	- 9 10
Less Residual Manurial Values	- - 2	- - 4
Net Feeding Stuffs	- 5 9	- 9 6
Labour	- 3 5	- 4 2
Sundries	1 - 8	- 15 2
Total Net Feeding Cost	4 13 -	3 14 1
Total Cost	82 8 3	62 12 1
Realisation Price*	90 16 1	69 - 5
Net Profit	£ 8 7 10	£ 6 8 4
Performance Data: Averages		
Liveweight store	9.50 cwt.	6.46 cwt.
Liveweight fat	10.67 "	7.66 "
Liveweight gain	1.17 "	1.20 "
Length of grazing period	95 days	112 days
Liveweight gain per head per day	1.38 lb.	1.20 lb.
Acres per store fattened	1.00 ac.	.66 ac.
Feeding cost per cwt. liveweight gain	£ 3 19 5	£ 3 1 9
Store cost per cwt. liveweight	£ 8 3 8	£ 9 2 5
Realisation price per cwt. liveweight*	£ 8 10 3	£ 9 - 2

*Includes deficiency payments

The costs, returns and profits per head for the two groups are given in Table V. This shows that the larger stores of 7½ cwt. and over earned a profit per head of £8.7s.10d. The margin for those under 7½ cwt. was a profit of £6.8s.4d. per head - a reduction of £1.19s.6d. compared to the figure for the heavier stores. It can also be seen that although the heavier stores cost appreciably less per cwt. as stores - £8.3s.8d. as against £9.2s.5d. - a difference of 18s.9d. per cwt. in their favour, they had not such a favourable realisation price as the lighter ones - £8.10s.3d. per cwt. liveweight as against £9.-s.2d. - a drop of 9s.11d. per cwt. Their overall advantage between buying and selling prices was thus 8s.10d. per cwt. Offsetting this advantage, to some extent, was an increased cost per cwt. liveweight gain of £3.19s.5d. as against £3.1s.9d. for the lighter stores. It may be noted in this respect that although the heavier stores made better daily liveweight gains - 1.38 lb. as against 1.20 lb. - a difference of .18 lb. per head per day in their favour, they needed an acre per head for grazing as against .66 of an acre per head for the lighter stores under 7½ cwt. This largely explains their higher cost per cwt. liveweight gain.

VII GROSS MARGINS

For farm management purposes it is more convenient to express the profitability of an enterprise in terms of the gross margins per head and per forage acre. The former is the difference between the realisation price per head and the store cost plus "variable" costs. "Variable" costs are those costs incurred directly as a result of the cattle enterprise being on the farm. These include such costs as purchased foods, home grown cereals at market price, casual labour, carriage and veterinary expenses, plus those variable expenses included in the forage crops consumed. Forage crops are hay, turnips, silage and potatoes. In this context no charge is made for straw or beet-tops consumed. The gross margin per acre is the gross margin per head expressed in terms of the total acreage of forage crops consumed. Appendices V(A), V(B) and V(C) show the gross margins per head and per acre, the output per forage acre (output being the sale price less the store cost per head) and the net profit per head.

Court Fed Cattle

a) Heavier Stores The gross margins per head and per acre for the groups over 9 cwt. and for those from 7-9 cwt. are seen to be £8.17s.8d. and £9.16s. respectively. These are to be compared with those on the accounting basis given in Table I which also shows the lighter stores to be more profitable. Expressing the results on a per forage acre basis gives gross margins per acre of £24.8s.1d. and £25.3s.11d. for stores over 9 cwt. and for those from 7-9 cwt. respectively.

b) Speaned Calves The group of speaned calves which consisted of crosses of the Shorthorn and Aberdeen Angus breeds sold fat had the highest gross margins per head - £15.5s.10d. as against £9.19s.4d. for those of the same type sold as stores. For the Friesians sold fat the gross margin per head was £13.17s.6d. These results to a large extent reflect the profits on an accounting basis given in Table II, though there has been a reduction in the relative profitability of the Friesians compared to the crosses of the beef breeds sold fat. This has been the result of charging home-grown grains, which form the greater proportion of their concentrate ration, at market price. Gross margins per acre were £44.6s.4d. and £28.6s.3d./

£28.6s.3d. for the crosses of the beef breeds sold fat and as stores respectively and £49.7s.5d. for the Friesians sold fat.

Grass Fed Cattle

The gross margins per head for the two groups of stores fattened on the grass were £10.2s.4d. for those stores 7½ cwt. and over and £7.9s.9d. per head for those under 7½ cwt. These figures show a slight improvement in favour of the heavier stores compared with the profits per head on the accounting basis (see Table V). Gross margins per acre were £10.2s.4d. for 95 days for the heavier stores and £11.6s.10d. for 112 days for those under 7½ cwt.

It is interesting to compare the figures of gross margins per forage acre earned by the different types of enterprises costed with the gross margins that could reasonably be obtained from the sale of arable crops such as wheat (£34), barley (£31), potatoes (£118) and sugar beet (£46). These figures clearly show that, apart from the production of fattened speaned calves in the courts, arable farmers should not increase the number of cattle over and above that needed to consume the feed crops and by-products of the rotation and to maintain the fertility of the farm. To do so would necessitate increasing the acreage of forage crops and result in a reduction in the acreage of the saleable arable crops and lowered total profits.

VIII SUMMARY

1. Forty-nine farmers co-operated in the investigation supplying records for 109 enterprises. Seventy-three were for the winter feeding of cattle in the courts.

2. The winter fed cattle were divided into five categories which were based on differences in the weight, the type of store and the class of animal produced. The summer fed cattle were divided into two categories based on the weight of the store animal.

3. The court-fed stores exceeding 9 cwt. at the start of fattening sustained a loss of 4s.7d. per head, those from 7-9 cwt. earned a profit of 15s.6d. per head. The greater profitability of the lighter type of store was chiefly the result of a lower cost per cwt. liveweight gain - £12.3s.5d. as against £13.4s.11d.

4. A comparison of the results for the four most and four least profitable lots in the group of stores exceeding 9 cwt. showed that the most profitable lots had the following advantages over the least profitable ones a) a better margin between the buying and selling prices per cwt. liveweight; b) a better daily liveweight gain per head and c) a lower cost per cwt. liveweight gain.

5. The Friesian was the most profitable type of speaned calf fed in the courts. Sold fat they earned a profit of £11.15s. per head. These were followed by the crosses of the Shorthorn and Aberdeen Angus breeds, also sold fat, £6.15s.8d. per head and those of a similar type sold as stores, £1.15s.9d. per head. The chief factor responsible for the greater profitability of the Friesians over the crosses of the beef breeds was a lower buying price per cwt. liveweight - £6.19s.8d. as against £8.15s.5d.

6./

6. Speaned calves were more profitable than the older stores of the same type chiefly on account of a lower cost per cwt. liveweight gain. This lower cost was associated with a relatively high daily liveweight gain per head.

7. Store cattle on the grass weighing 7½ cwt. and over were more profitable than those under this weight. They earned a profit of £8.7s.10d. per head compared to £6.8s.4d. per head for the lighter type of store. Although the heavier store cost 17s.8d. more per cwt. liveweight gain they cost less per cwt. liveweight as stores - lower by 18s.9d. They sold for 9s.11d. less per cwt. liveweight, thus had an advantage over the smaller stores, between the buying and selling prices, of 8s.10d. per cwt. liveweight.

8. The gross margins per forage acre for all the enterprises studied, apart from those for the two groups of stores sold fat were appreciably less than could be obtained from the sale of such arable crops as wheat, barley, sugar beet and potatoes. It would therefore be more profitable for an arable farmer to increase the acreage of saleable arable crops (within the limits imposed by the rotation policy and the need to maintain soil fertility) rather than feed an increased number of cattle.

ACKNOWLEDGMENT

Grateful acknowledgment is made of the help given by the farmers who took part in the investigation and supplied the necessary records and other information and who always gave the investigator considerate and courteous attention on the occasion of his visits.

APPENDIX I

COSTING PROCEDURE

Purchased Foods All foods purchased, whether concentrates or roughages have been charged at cost (including haulage to the steading).

Home Grown Foods These have been charged at prices intended to cover costs of production, including carting to a point within close proximity to the courts from which stage the foods are handled by the cattleman and/or assistants. For "average" conditions the following gross costs or values have been used:-

Crop	Price per cwt.	Crop	Price per cwt.
Oats & Barley	16s.2d.	Beet Tops	1s.8d.
Hay	7s.6d.	Swedes & Turnips	1s.8d.
Feeding Straw	3s.4d.	Kale	1s.7d.
		Silage (Grass)	2s.7d.

No charge has been made for straw used as litter.

Initial Cost of Stores These are the actual costs of the stores purchased plus the value of any grazing prior to going into the courts. Any own-bred stores were valued at cost of production. In the case of cattle fattened on the grass the cost of court feeding or supplementary feeding on the grass, if outside prior to going to full grazing in April, was added to the cost of the store beast.

Labour This is based on the actual wages (including perquisites) paid to the cattleman; where the farmer looked after the cattle his time has been included at current rates. Other labour comprised the help given to the regular cattleman in such tasks as slicing turnips and bedding the courts and has been charged at appropriate rates.

Power Tractors used in feeding or bedding has been charged at 4s.3d. per hour.

Sundry Expenses Included in these are small expenses directly chargeable to the cost of beed production e.g. haulage of cattle, veterinary fees etc.

Overheads These have been calculated on bases agreed by the Scottish Conference of Agricultural Economists.

Credits Any receipts for animals which died or were sold as casualties have been deducted from the total costs to give the net costs.

Ungraded Animals All expenses incurred in connection with these animals have been excluded from the costs of the fattened cattle.

Managerial Salary and Interest on Capital No charge has been made in the costs for managerial salary or interest on capital.

APPENDIX II

AVERAGE RATIONS PER HEAD PER DAY FOR DIFFERENT GROUPS STUDIED

Type	Stores		Speaned Calves		
	Over 9 cwt.	7-9 cwt.	Shorthorn, Aberdeen Angus Crosses		Friesians
	Sold Fat	Sold Fat	Sold Fat	Sold as Stores	Sold Fat
	lb.	lb.	lb.	lb.	lb.
Compound Meals	1.73	1.81	1.90	2.93	2.48
Beet Pulp	1.42	.59	.30	-	-
Draff*	.80	.82	-	-	-
Home Grown Cereals	2.86	3.17	3.06	2.11	10.35
Total Concentrates*	6.21	5.77	5.26	5.04	12.83
Hay	10.28	12.50	6.49	7.69	3.86
Straw	6.24	3.88	2.20	1.66	1.88
Turnips	42.61	40.26	16.83	14.69	22.18
Silage	9.76	4.16	16.79	9.77	13.48
Potatoes	2.68	1.72	.66		
Beet Tops	3.73	.08	1.37		

*4 lb. draff has been taken as equivalent to 1 lb. meal in estimating the total weight of concentrates fed per head per day.

APPENDIX III

PATTERNS OF STORE COSTS

1962		Court Fed Cattle					Grass Fed Cattle	
		Stores over 9 cwt.	Stores 7-9 cwt.	Speaned Calves			Stores 7½ cwt. & over	Stores under 7½ cwt.
		Short. & A.A. X's Fattening	Short. & A.A. X's Fattening	Shorthorn & A.A. X's Fattening	Shorthorn & A.A. X's Storing	Friesians Fattened	Short. & A.A. X's Fattening	Short. & A.A. X's Fattening
Apr.	Cost/cwt.	£8. -s.	£7.18s.					
	%*	23%	24%					
June	Cost/cwt.	£8.12s.						
	%	1%						
July	Cost/cwt.	£7.10s.	£8.12s.					
	%	7%	4%					
Aug.	Cost/cwt.	£7.16s.	£8.12s.					
	%	13%	3%					
Sep.	Cost/cwt.	£8. -s.	£7.19s.					
	%	16%	33%					
Oct.	Cost/cwt.	£8. -s.	£8. 9s.	£8. 1s.	£9. 2s.	£7.11s.	£8. 7s.	£8.15s.
	%	18%	30%	71%	85%	60%	38%	88%
Nov.	Cost/cwt.	£7.14s.		£10.13s.	£7.12s.	£6. 7s.		
	%	16%		23%	15%	40%		
Dec.	Cost/cwt.	£7.15s.	£8.10s.	£8. 3s.				
	%	4%	2%	6%				
1963 Jan.	Cost/cwt.	£7.12s.	£8.10s.				£8. 4s.	
	%	1%	2%				5%	
Feb.	Cost/cwt.	£7.12s.	£8.10s.				£7.12s.	
	%	1%	2%				9%	
Mar.	Cost/cwt.						£8. 6s.	
	%						17%	
Apr.	Cost/cwt.						£7.19s.	£11. -s.
	%						19%	6%
May	Cost/cwt.						£7.16s.	£9. 3s.
	%						6%	6%
July	Cost/cwt.						£7.12s.	
	%						6%	

*These are percentages of the total stores put into the court.

APPENDIX IV

PATTERNS OF SALE PRICES

1962		Court Fed Cattle					Grass Fed Cattle	
		Stores over 9 cwt.	Stores 7-9 cwt.	Speaned Calves			Stores 7½ cwt. & over	Stores under 7½ cwt.
		Short. & A.A. X's Sold Fat	Short. & A.A. X's Sold Fat	Short. & A.A. X's Sold as Fat	Stores	Friesians Sold Fat	Short. & A.A. X's Sold Fat	Short. & A.A. X's Sold Fat
Nov.	Price/ cwt.°	£7.19s.	£9. 8s.					
	%*	4%	1%					
Dec.	Price/ cwt.	£8. 7s.	£8.19s.	£8.17s.				
	%	11%	6%	2%				
1963 Jan.	Price/ cwt.	£8. 2s.	£8.12s.	£9. 5s.				
	%	12%	23%	6%				
Feb.	Price/ cwt.	£8. 1s.	£8.16s.	£8. 5s.	£9.12s.	£8. -s.		
	%	18%	18%	15%	12%	7%		
Mar.	Price/ cwt.	£8.10s.	£8.15s.	£9. 4s.	£10. -s.	£8.12s.		
	%	10%	19%	12%	12%	36%		
Apr.	Price/ cwt.	£8.12s.	£8.15s.	£9. 8s.	£9. 8s.	£9.10s.		
	%	24%	20%	30%	60%	38%		
May	Price/ cwt.	£9. -s.	£9. 2s.	£9. 8s.	£9.15s.	£9. 7s.	£9. 3s.	£9.10s.
	%	16%	12%	27%	16%	17%	4%	6%
June	Price/ cwt.	£9.19s.	£9.10s.	£10. -s.		£8. 8s.	£9. 6s.	£9.17s.
	%	5%	1%	8%		2%	26%	19%
July	Price/ cwt.						£8.12s.	£9. 3s.
	%						33%	21%
Aug.	Price/ cwt.						£8. 3s.	£8.13s.
	%						13%	15%
Sep.	Price/ cwt.						£7.18s.	£8.14s.
	%						9%	18%
Oct.	Price/ cwt.						£7.19s.	£8. 5s.
	%						12%	20%
Nov.	Price/ cwt.						£7.14s.	£7.10s.
	%						3%	1%

°Sale prices per cwt. liveweight including subsidies.

*Percentage of total sold fat.

APPENDIX V(A)

COSTS, RETURNS AND MARGINS PER HEAD AND PER ACRE
HEAVY AND LIGHT COURT FED STORES

	Store Weights					
	Over 9 cwt.			7-9 cwt.		
	£	s.	d.	£	s.	d.
Variable Costs Directly Attributable to Cattle						
Concentrates	7	11	9	6	16	9
Purchased Potatoes	-	-	2	-	1	-
Vet. and Medicines	-	4	3	-	4	10
Other Sundry Direct Costs	-	11	2	-	9	9
Total	8	7	4	7	12	4
Variable Costs Attributable to Roughages						
Seeds, Manures, Casual Labour, Sundries -						
Crop:	Acreage Equiv.			Acreage Equiv.		
Hay	.235	1	-	.290	1	4
Turnips	.070	-	14	.070	-	14
Silage	.042	-	4	.018	-	1
Potatoes	.017	-	17	.011	-	11
Total	.364	2	15	.389	2	11
Total Variable Costs		11	3		10	4
Cost Price		75	18		67	13
Realisation Price		95	19		87	13
Gross Output per Head		20	-		20	-
Gross Margin per Head		8	17		9	16
Gross Margin per Acre		24	8		25	3
Output per Forage Acre		55	-		51	8
Other (Fixed) Costs						
Labour on Cattle		2	7		2	12
Machinery on Cattle		-	1		-	1
Labour, Machinery etc. on Forage Crops		5	8		5	14
General Expenses		1	6		1	9
Total		9	3		9	17
Total Feeding Costs per Head		20	6		20	1
Total Costs per Head		£96	4		£87	14
Loss per Head		£ -	5		£ -	1

APPENDIX V(B)

COSTS, RETURNS AND MARGINS PER HEAD AND PER ACRE

COURT FED SPEANED CALVES

	Sold Fat				Sold as Stores	
	Shorthorn & Aberdeen Angus Crosses		Friesians		Shorthorn & Aberdeen Angus Crosses	
	£ s. d.		£ s. d.		£ s. d.	
Variable Costs Directly Attributable to Cattle						
Concentrates	8 18 10		25 18 -		9 10 5	
Vet. and Medicines	- 2 6		- 2 3		- 2 1	
Other Sundry Direct Costs	- 9 9		- 14 4		- 12 -	
Total	9 11 1		26 14 7		10 4 6	
Variable Costs Attributable to Roughages						
Seeds, Manures, Casual Labour, Sundries -						
Crop:	Acreage Equiv.		Acreage Equiv.		Acreage Equiv.	
Hay	.202	- 17 2	.135	- 11 5	.255	1 1 8
Turnips	.039	- 7 10	.058	- 11 8	.036	- 7 3
Silage	.098	- 10 -	.088	- 9 -	.061	- 6 3
Potatoes	.006	- 6 2	-	- - -	-	- - -
Total	.345	2 1 2	.281	1 12 1	.352	1 15 2
Total Variable Costs		11 12 3		28 6 8		11 19 8
Cost Price		46 6 7		41 10 5		42 - 10
Realisation Price		73 4 8		83 14 7		63 19 10
Gross Output per Head		26 18 1		42 4 2		21 19 -
Gross Margin per Head		15 5 10		13 17 6		9 19 4
Gross Margin per Acre		44 6 4		49 7 5		28 6 3
Output per Forage Acre		77 19 8		150 4 1		62 7 2
Other (Fixed) Costs						
Labour on Cattle		2 10 -		2 19 6		2 2 -
Machinery on Cattle		- 1 1		- 2 6		- - 6
Labour, Machinery etc. on Forage Crops		5 10 6		5 4 2		6 5 6
General Expenses		1 9 -		1 12 1		1 3 6
Total		9 10 7		9 18 3		9 11 6
Total Feeding Costs per Head		21 2 10		38 4 11		21 11 2
Total Costs per Head		£67 9 5		£79 15 4		£63 12 -
Profit per Head		£ 5 15 3		£ 3 19 3		£ - 7 10

APPENDIX V(C)

COSTS, RETURNS AND MARGINS PER HEAD AND PER ACRE
HEAVY AND LIGHT - GRASS FED STORES

	Shorthorn and Aberdeen Angus Crosses	
	7½ cwt. and over 1 acre grazing 95 days	Under 7½ cwt. .66 acres grazing 112 days
	£ s. d.	£ s. d.
Variable Costs Attributable to Cattle		
Concentrates	- 7 4	- 11 6
Sundry Direct Costs	- 11 2	- 5 10
Variable Costs Attributable to Grazing	2 - -	1 15 4
Total Variable Costs	2 18 6	2 12 8
Cost Price	77 15 3	58 18 -
Realisation Price	90 16 1	69 - 5
Gross Output per Head	13 - 10	10 2 5
Gross Margin per Head	10 2 4	7 9 9
Gross Margin per Acre	10 2 4	11 6 10
Output per Acre	13 - 10	15 6 8
Other Costs		
Labour	- 3 5	- 4 2
Labour, Machinery etc. on Grazing	1 3 2	- 9 11
General Overheads	- 9 6	- 9 4
Total Other Costs	1 16 1	1 3 5
Total Costs	82 9 10	62 14 1
Net Profit	£8 6 3	£6 6 4