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Sheep - Cost of production

Bulletin No. 84/EC48.

Agricultural Economics Department

University of Manchester

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GRASS FATTENED SHEEP, 1954/5.

Interim Report on an economic investigation

in the North-West.

by

T. Kempinski.

Price: Two shillings.

September, 1956.



Printed in Great Britain

Agricultural Economics Department

University of Liverpool

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Interim Report on an economic investigation

in the North-West

by

J. K. R. [Name]

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### Acknowledgement.

Investigations of this nature are possible only through the co-operation of farmers who share their time, knowledge and information with the Department. To them, and to his 'back-room' colleagues, the author expresses his indebtedness.

Co-operating farmers have already received summaries of the individual flock results; these can now be compared with the group results presented in this report.

## SUMMARY

1. This interim report deals with financial results for the year 1954/5 from 63 grass sheep flocks in the North-West.

2. The average results per ewe were:

Stock Inputs	£12 17 3d.
Stock Outputs	<u>£20 18 9d.</u>
Gross Margin	<u>£ 8 1 6d.</u>
Other Inputs	£ 6 9 6d.
Net Margin	£ 1 12 0d.

Lambing Ratio 136.

3. Forty-two of the flocks were classified into two groups, according to whether the ewes had any blood of the longwool breeds. The 'longwool' group had a higher lambing ratio and - despite lower receipts per lamb due to later selling - a better Net Margin per Ewe.
4. The cost of additional feeding required for early fattening tended to outweigh the seasonal price advantage. This may have been partly due to the exceptionally slow growth of some pastures in 1955.
5. The average cost of grazing per ewe was £3-0-2d., and the estimated acreage grazed was 56 acres per 100 ewes.
6. The average cost of supplementary feed per ewe was £1-9-0d. The estimated consumption per 100 ewes was: one acre corn,  $\frac{1}{2}$  acre roots,  $1\frac{1}{4}$  acres hay and silage, and 3 tons purchased concentrates.
7. Direct labour cost was 19s. 8d. per ewe. The average cost of labour per ewe tended to decrease with increasing size of flock.
8. The following average results per fat lamb were calculated for 43 flocks:

Cost	£5 16 2d.
Receipts	£6 19 0d.
Net Margin	£1 2 10d.
Dressed Carcase Weight	44.83 lbs.

The average cost per lb. of lamb was 2s.  $7\frac{1}{2}$ d.

## GRASS FATTENED SHEEP, 1954/5

### 1. INTRODUCTION.

If agriculture is regarded as a source of livelihood, it is the net farm income that matters most to the farmer. Since farm income is derived from the sales of agricultural products, it is obvious that the cost and volume of his production should be closely watched by any farmer who is interested in making his farm as profitable as he can.

Although many farming activities are inter-related (for instance, grassland management may affect the production of milk, beef and mutton - all on one farm), it is often useful to treat one branch of farming as a separate enterprise and thus bring into focus its peculiar problems. It is in this spirit that the present investigation has been conducted, and the reader should bear in mind the fact that the results quoted apply to the Sheep enterprise only, and do not necessarily reflect the financial position of the survey farms taken as a whole. Thus, a farm may show a high margin per ewe, but if milk is its chief source of revenue and is produced at a relatively high cost per gallon, then the total net farm income may be quite unsatisfactory. However, the individual flock results studied in conjunction with the group averages should give each co-operating farmer some indication as to whether the sheep enterprise is pulling its weight in his farm business.

The present bulletin refers to the first year of a two-year investigation into costs and returns of grass fattened sheep in North-West England. The accounting period covers the twelve months from October 1st, 1954 to September 30th, 1955. The results given in the report are based on information obtained from sixty-three farms, of which thirteen are situated in Cheshire, thirty in Lancashire, one in Shropshire and nineteen in Staffordshire. On each farm the basis of the sheep enterprise is the production of lambs for sale fat (as lambs or hoggets): occasionally lambs may be sold as stores and, less often, a few are retained for flock replacement. The majority of the ewes and rams are purchased and kept for a varying number of years before being fattened for sale.

### 2. BREEDS

In looking for factors which might be expected to influence the profitability of a flock by affecting the costs and receipts, the following points spring to mind: (a) the number of lambs reared per ewe, (b) the weight at which the lamb is 'mature', (c) the time taken to reach maturity. Various breeds of sheep differ in these respects, and it would be useful if relative profitability of flocks of different breeds could be established. In the present sample, however, there are twenty seven different breeds and crosses of ewes, and fourteen of rams, which makes it impossible to draw general conclusions as to the merits of any particular cross or breed.

In view of this diversity, the only practicable basis for a breed classification of the survey flocks was thought to be the presence or absence

of blood of a 'longwool' breed among the ewes. The two groups thus formed have been called 'longwool' and 'shortwool' for convenience.\* The actual make-up of these groups is shown in Table 1. Twenty-one flocks had to be excluded from this classification because each of them contained ewes from both groups.

Table 1                      Number of Flocks in Breed Groups

Breed Group	Type of Ewes	Type of Rams			
		Longwool	Shortwool	Longwool and Shortwool, or Longwool and Longwool X Shortwool	Shortwool and Mountain
'Longwool' } (18 Flocks)	Longwool	1	1	-	-
	Longwool x Mountain	2	10	4	-
'Shortwool' } (24 Flocks)	Shortwool	-	21	-	-
	Mountain	-	2	-	1

It is interesting to note that all the Lancashire flocks which could be classified belong to the 'longwool' group, whilst this group contains only three flocks from the other counties. On the other hand, all but one of the classifiable flocks on farms situated more than 350 ft. above sea level are in the 'shortwool' group; this group, however, also contains some flocks on low-lying farms.

### 3. COST, RETURN AND MARGIN PER EWE

Table 2 presents a summary of the average results for the whole sample of farms and for the two breed groups. A more detailed picture of the composition of the income and expenditure will be found in Appendix II.

Some of the items which make up the production, cost and margin are likely to be influenced by the natural characteristics of each breed or cross of sheep. Thus 'Gross Margin' depends largely on the lambing ratio and on the weight and date of sale of the mature lambs, and these qualities are associated with breed. One would expect age of ewes also to have some effect on the ewes' fecundity and thus affect the financial results, but no such influence can be detected in the present survey.

\* See Appendix I: Definitions.

Table 2

## Classified Financial Results per Ewe

Group	Longwool	Shortwool	All Flocks
No. of Flocks	18	24	63
	£ s d	£ s d	£ s d
Stock Inputs -			
Opening Valuation	9 5 7	8 16 5	8 17 2
Purchases	4 17 0	3 18 6	4 0 1
(a) Total	14 2 7	12 14 11	12 17 3
Stock Outputs -			
Sales	11 5 4	10 12 4	10 13 9
Closing Valuation	11 12 7	9 10 11	10 5 0
(b) Total	22 17 11	20 3 2	20 18 9
GROSS MARGIN (b - a)	8 15 4	7 8 3	8 1 6
Other Inputs -			
Labour	1 1 9	1 1 3	19 8
Supplementary Feed	1 3 10	1 17 6	1 9 0
Grazing	3 11 4	2 7 3	3 0 2
Sundry Direct Costs (including Vet.)	6 9	7 10	6 9
Depreciation & Repairs (Specialised Equip.)	5	6	5
Share of General Farm Expenses	9 10	9 4	9 2
Transport and Marketing	4 2	4 6	4 4
Total Other Inputs	6 18 1	6 8 2	6 9 6
NET MARGIN (Gross Margin - Total Other Inputs)	1 17 3	1 0 1	1 12 0

Other factors - such as the cost of labour, grazing and supplementary feeding - may be said to depend partly on management and partly on natural causes.

Our study seems to have thrown some light on a few of the above-mentioned factors, and these are discussed in the subsequent paragraphs. It should, however, be understood that an investigation covering one year only is not sufficient to give an even approximately typical picture of the economics of sheep farming. The summer of 1955 was exceptionally dry and the pattern of monthly weights and prices of fat lambs may be expected to be different in a more usual season, when grass is more plentiful. Also another year's accounts will reveal the prices received for those lambs kept after September 30th, of which there were many more in the Closing than in the Opening Valuation. This report should, therefore, be regarded as an interim one, and it is



hoped that, when the second year of the investigation has been completed, a less tentative and more complete picture will emerge.

Much of the discussion which follows is based on the different characteristics of the two breed groups into which the flocks have been classified. Some of these features may have been peculiar to the 1954/5 season, but it was thought that by assembling them in one table (Table 3) we should make it easier for the reader to follow the arguments as they develop through the report.

Table 3: Main Characteristics and some Average Results for two Breed Groups

	Longwool (18 Flocks)	Shortwool (24 Flocks)
Average Altitude of Farms (above mean sea level)	153 ft.	397 ft.
<u>Number of Farms in each County</u>		
Cheshire	2	9
Lancashire	15	-
Shropshire	-	1
Staffordshire	1	14
Lambing Ratio	148	129
Percentage of Fat Lambs sold April-May	2.5%*	7.9% <sup>x</sup>
Weight per Fat Lamb sold April-September	45.62 lb*	45.30 lb. <sup>x</sup>
Fat Lamb Sales (per Fat Lamb)	£6 16 0*	£7 6 2 <sup>x</sup>
Supplementary Feed Cost per Ewe	£1 3 10	£1 17 6
Grazing Cost per Ewe	£3 11 4	£2 7 3
Net Margin per Ewe	£1 17 3	£1 0 1

\* Based on data from 17 flocks.

<sup>x</sup> Based on data from 20 flocks.

#### 4. QUALITIES OF THE EWE

The number of lambs reared per ewe is largely determined by the ewe's fecundity and her ability to feed them. The average ratio in the present survey is 136 lambs reared per hundred ewes put to ram, but there is a marked difference between the two breed groups, the lambing ratio being 148 for the 'longwool' and 129 for the 'shortwool'. Results from one year's study should be treated with some reserve but half the 'longwool' flocks were composed wholly or partly of greyface ewes and, of the remaining nine flocks, four consisted of mashams. Both

these types of ewes are known to be good milkers, and the greyface are noted for their fecundity.\*

Grazing seems to be the only cost item which was appreciably influenced by the lambing ratio. It may be assumed that at least part of the difference in the grazing cost per ewe between the two breed groups in Table 2 is due to the fact that a ewe with twin lambs requires more grazing than one with a single lamb. Since, however, the 'longwools' had a lower supplementary food cost per ewe - partly perhaps due to the ewes being naturally good milkers - the total difference in cost ('total other inputs') was only 10/- per ewe.

Gross Margin per ewe was so much larger for the 'longwool's that it more than made up for the greater cost, causing the Net Margin per ewe to be over 17/- higher for the 'longwools' than for the 'shortwools'. A large part of the difference in Gross Margin must be due to the difference in the lambing ratio. The following calculation illustrates this point. If all reared lambs were sold fat from one 'longwool' and one 'shortwool' flock, then, by applying the appropriate average price per lamb and lambing ratio to each flock the receipts per ewe would be:

'Longwool' : £6-16-0 x 1.48 = £10-1-3

'Shortwool': £7- 6-2 x 1.29 = £ 9-8-7

- the difference in favour of the 'longwools' being 12/8d.

The foregoing paragraphs show the economic advantage of a high lambing ratio since, even with a lower price per lamb, the resulting receipts per ewe can be sufficient to outweigh the higher rearing cost.

## 5. GROWTH AND MATURITY OF THE LAMBS

### A. Comparison between Breed Groups

The seasonal price structure gave farmers an incentive to make the lamb fattening period as short as possible: it can be seen in Table 4 that, from month to month, although the weight per lamb sold rose, receipts per lamb tended to become less. Early sales may also have released some of the pasture for grazing by cattle, thus preventing a possible shortage of keep.

One would expect the influence of breed to be strong with regard to the length of the fattening period, but in the present survey the lambs of the 'longwool' group did not, on the whole, reflect the early maturity for which

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\* See 'Sheep Crosses in N.E. England' by Dent and Cooper ('Agriculture' Vol.LXIII No.4.)

Table 4

Average Results of Fat Lamb Sales According to  
Month of Sale

Group	Longwool (17 Flocks)			Shortwool (20 Flocks)		
	Receipts Per Lamb	Weight Per Lamb	Percentage sold	Receipts Per Lamb	Weight Per Lamb	Percentage sold
Month	£ s d	lbs.	%	£ s d	lbs.	%
April	8 5 2	39.00	0.1	6 12 0	35.42	2.3
May	7 14 2	39.60	2.4	7 7 10	38.32	5.6
June	6 15 0	42.88	13.8	7 2 0	43.89	24.9
July	6 15 2	44.11	32.5	7 10 2	46.79	28.8
August	6 12 10	46.10	26.8	7 3 10	48.85	14.2
September	6 15 7	48.39	24.4	7 0 5	46.18	24.2
WHOLE SEASON	6 16 0	45.62	100.0	7 6 2	45.30	100.0

N.B. One 'longwool' and four 'shortwool' flocks are excluded from the table, either because none of their 1955 lambs were sold fat before September 30th or because insufficiently detailed information was obtained.

the longwool breeds are noted. This may be due to genetic causes, most of the lambs having been sired by shortwool rams and many of the ewes possessing some blood of the mountain breeds. It is also possible that early growth of the lambs was hampered not by any inherited factor but by shortage of grass after an excessively wet season. Table 4 suggests, however, that those few lambs in the 'longwool' group which were sold fat in April and May did possess the early maturing characteristics of their longwool ancestry: their average weight was higher than that of the 'shortwool' group, and they realised a higher price per lb., perhaps because of the high quality of their carcass in the early part of the season.

Very possibly feeding was of greater importance than heredity in determining the supply of early fat lambs in the spring of 1955. Whilst a farmer's intention to supply the early market will control his policy for lambing dates and degree of concentrate feeding, natural conditions may largely determine the flow of fat lambs through the rest of the season. Thus a cool spring in 1955, after almost a year of wet weather, was followed by an exceptionally dry summer; these factors may well have affected the higher lying farms more severely than the rest in reducing the growth of grass. A shortage of grazing would encourage a farmer to dispose of some lambs as quickly as possible. So we find that one-third of the 'shortwool' lamb sales were made before the end of June, compared with only one-sixth of the 'longwool' lamb sales. These sales of 'shortwool' lambs from the higher lying farms would reduce the pressure on grazing and do much to explain the difference in grazing acreage required per ewe by the breed groups as shown in Table 6.

By dint of heavier supplementary feeding to achieve early sales and the reduced ratio of lambs to ewes remaining on grass as a result of these early sales, together probably with the influence of a lower proportion of twin lambs, farmers with 'shortwool' flocks were able to sell lambs of heavier average weight through the summer until the 'longwools' overtook them in September. Even then they obtained rather more for their 'shortwool' lambs. Indeed, taking the season as a whole, the 'shortwool' group averaged approximately 10/- more per lamb than did the 'longwool' group: this was almost sufficient to counterbalance the higher costs per lamb but it was not enough to outweigh the lower lambing ratio.

#### B. Early and late-selling Flocks

Since both our so-called 'longwool' and 'shortwool' groups consist of flocks containing many breeds and crosses, situated on farms with different natural features and methods of management, it was to be expected that in each group there would be flocks with varying rates of liveweight increase and varying proportions of lambs sold during the different months. It was, therefore, decided to classify the flocks according to (a) the average length of their fattening period and (b) average date of fat lamb sales, irrespective of breed, in order to study the effect of these factors on the economic results of the sheep enterprise. Both these methods of classification revealed similar trends, but the date-of-sales grouping was chosen for inclusion in Table 5 because it shows the different relationships rather more clearly.

In accordance with the trend of fat lamb receipts shown in Table 4, sales per ewe went down in value as the average date of lamb sales became later, despite the tendency to increasing weight per lamb. However, as Table 5 shows, later sales were associated with higher lambing ratios, and many farmers with a high percentage of the lighter twin lambs seem to have kept them till after the end of September. The lambs retained were valued at current prices and the upward trend of Gross Margin indicates that a high lambing ratio brought farmers a greater potential profit than ability to sell in the high priced early lamb market.

The earliest-selling flocks had a markedly higher Supplementary Feed cost than the other flocks - an association noticed earlier when the breed groups were being compared. On the other hand, Grazing Cost does not show the steady upward trend which might have been expected with an increasing number of grazing days when lambs are kept till a later date. This may explain to some extent the fact that Total Feed cost (i.e. Supplementary Feed and Grazing combined) shows a downward trend in the first three groups in Table 5, causing a similar trend in "Total Other Inputs" of which food costs form the largest part.

Since, in the groups studied, the average Gross Margin increases as the average selling date moves on and the cost of other inputs tends to decline, Net Margin, which is the difference between them, shows an upward trend in the first three groups. The latest-selling group does not follow



the downward trend of costs, possibly because a relatively large number of lambs reared, few of which were sold early, resulted in a large number of grazing days per ewe. Even so, the Gross Margin of this group was sufficiently high for the Net Margin to be of a relatively high order.

Table 5      Average Results per Ewe for 61 Flocks, Grouped by Average Dates of Fat Lamb Sales

	Average Date of Fat Lamb Sales			
	June 4 - - July 6	July 9 - 31	August 1 - 12	August 14 - - Sept 23
No. of Flocks	15	14	17	15
Lambing Ratio	126	136	137	141
Sales per Ewe	£ s d 12 9 5	£ s d 11 4 10	£ s d 10 7 7	£ s d 8 7 2
Gross Margin	7 3 0	8 3 1	8 4 2	8 11 2
Supplementary Feed	2 1 0	1 3 7	1 6 0	1 4 7
Grazing	2 18 7	3 6 0	2 12 10	3 4 5
Total Feed (= Supplementary Feed + Grazing)	4 19 7	4 9 7	3 18 10	4 9 0
Total Other* Inputs	7 4 11	6 15 9	5 12 3	6 5 9
Net Margin (Gross Margin - Total Other Inputs)	-0 1 11	1 7 4	2 11 11	2 5 5
Weight per Fat Lamb (lbs.)	44.02	43.83	44.98	47.74

\* All inputs (including Feed) other than Stock Inputs.

Notes to Table 5:

1. Only those items are included in the table which illustrate the relationship between the date of sale and the financial results.
2. Two of the survey flocks could not be included as none of their 1955 lambs were sold fat before the end of the accounting period.
3. Weights per lamb are averages for 15, 13, 17 and 14 flocks respectively. The weights from the two remaining flocks were not recorded.
4. Gross margin is the difference between the sales plus closing valuation and opening valuation plus purchases (see Table 2).

These results do not prove, of course, that late selling is always more profitable than early selling. Under the prices ruling during 1955 any lamb

which reached, say, 38 lb. deadweight in May was probably worth selling rather than keeping. However, the figures in Table 5 seem to indicate that the intentional policy of producing early lambs (as distinct from the early selling of lambs which reached a suitable weight) involved so much expense in winter feeding of ewes that it would only have been justified in flocks with a high lambing ratio.

#### 6. SUPPLEMENTARY FEEDING

It can be seen in the preceding section that in the flocks under review the length of time from birth to maturity seemed to be associated in 1954-5 with the amount of food supplied to the sheep apart from grazing. The cost of this supplementary feed is seen in Table 2 to be the second largest item in the list of 'Other Inputs'.

The average composition of the Supplementary Feed per ewe by quantities and value is shown in Appendix II. If the quantities of home grown foods are converted into acreages by applying the estimated average yields per acre, the approximate supplementary food requirements for the 1954/55 season per 100 ewes can be stated as follows:

(a) Home-grown Foods:

1 acre corn (mainly oats)  
 $\frac{1}{2}$  " roots (mainly mangolds)  
1 " hay  
 $\frac{1}{4}$  " silage.

(b) Purchased Foods:

37 cwt. compound cake  
22 $\frac{1}{2}$  " other concentrates.

There were considerable differences between the actual amounts fed per ewe on individual farms. To some extent these amounts seemed to be influenced by the type of sheep kept, since there was a definite tendency for the Supplementary Feed cost per ewe to be higher in the 'shortwool' flocks. The average for this group is 57 per cent. higher than for the 'longwool' group, and this is not due to a few exceptionally high-feeding farms. Whereas Supplementary Feed per ewe cost £1 or more in almost three-quarters (17) of the 'shortwool' flocks and £2 or more in eleven of them, in the 'longwool' flocks Supplementary Feed per ewe cost £1 or more in only half (9) of the flocks and £2 or more in less than one-quarter of them (4 flocks).

If cost per lamb reared were to be calculated, the feed cost for the 'shortwool' would be about 80 per cent. higher than that for the 'longwool' because of the higher lambing ratio of the latter.

Among the possible reasons for this difference between the groups are two facts mentioned earlier in this report. Firstly, the 'longwool' ewes may be naturally better milkers, thus requiring less feeding. Secondly - and this is not really dependent on breed but rather on the tendency for breed types

to be associated with certain districts - grazing may be less abundant on the high-altitude farms, of which there are more in the 'shortwool' group, and high feeding may thus be essential, especially if pasture is required for other stock and the farmer wishes to fatten the lambs in the shortest possible time.

It was mentioned previously that in our sample of flocks early lamb sales seemed to be associated with high supplementary feeding. The results shown in Table 5 point to the conclusion that early lamb sales were not, on the whole, associated with sufficiently higher prices to offset the combined effects of the higher feed costs and lower lambing ratio which in our sample accompanied early lamb production.

## 7. GRAZING

The costs attributed to grazing account for almost half of the expenses of the sheep flocks (excluding stock purchases) studied in this survey (Table 2). Any consideration of profitability in these enterprises might, therefore, be expected to concentrate largely on the influence of grassland management. The allocation of grassland costs between the classes of grazing animals necessarily depends, however, upon a number of rather arbitrary assumptions. Consequently it is desirable to relate variations in grassland management to total livestock results - or even to the financial results for the whole farm.<sup>x</sup> The following comments should be read in the light of these remarks and should certainly not be interpreted as comments upon the management of grassland.

Table 6                      Grass Cost per acre and per ewe by type of flock

	Longwool Flocks	Shortwool Flocks	All Flocks
Number of Flocks	18	24	63
Cost of grass production per acre	£7 9 0	£6 5 5	£7 3 2*
Grazing per 100 ewes - acres	56	45	56 *
Grazing cost per ewe	£3 11 4	£2 7 3	£3 0 2

### Notes:

1. Results marked\* are average of 62 Flocks only; records of grazing acreage on one farm were unreliable.
2. Acreage Grazed per 100 Ewes is based on the share of grazing attributable to sheep, since most pastures and aftermath were used by cattle as well as sheep.

There were marked differences in the numbers of ewes per acre and in grassland costs - both per acre and per ewe - between the breed groups (Table 6.). Since the 'longwool' group had a higher lambing ratio and also tended to sell its lambs later it is reasonable for these flocks to tend to use more grass and to have a higher grazing cost per ewe. The 'shortwool' flocks tended to occupy higher land where intensive management of grassland is less common than on the

<sup>x</sup> See, for example, "A Study of Farm Organisation and Management in the North West" Manchester University Bulletin No. 83/FMS/19 pp. 32-36.

lowland farms - perhaps justifiably so - and consequently this group had a lower grass cost per acre.

Table 7 Certain Average Results per Ewe for 62 Flocks arranged in order of Cost of Grass Production per Acre

No. of Flocks	15	16	16	15
Lambing Ratio	137	147	127	135
Cost of Grass Production per acre:	£ s d	£ s d	£ s d	£ s d
Average	3 15 5	5 12 10	7 14 0	11 11 7
Lowest	2 12 0	4 14 2	6 15 7	9 6 2
Highest	4 13 0	6 12 5	9 0 5	14 17 10
RESULTS PER EWES:				
Gross Margin	8 14 9	8 16 0	6 19 10	8 1 7
Supplementary Feed	1 12 0	1 0 10	1 6 5	1 19 2
Grazing	2 3 7	2 15 0	3 8 4	3 16 8
Total Feed (Suppl. Feed + Graz.)	3 15 7	3 15 10	4 14 9	5 15 10
Total Other* Inputs	5 15 5	5 12 11	6 13 11	8 1 11
Net Margin (Gross Margin - Total Other Inputs)	2 19 4	3 3 1	0 5 11	-0 0 4

\* All inputs (including Feed) other than Stock Inputs.

Notes to Table 7:

1. Only those items are included in the table which illustrate the relationship between Grass Cost per acre and financial results per ewe.
2. One flock is excluded as its grazing acreage was uncertain.

In Table 7 the flocks are grouped (irrespective of breed) by cost of grass production per acre. As could be expected, the higher cost grassland tends to be situated on the lower lying farms (mainly in Cheshire and Lancashire). It will be seen that as the cost per acre increases the cost of grazing per ewe also rises. Although the latter rises much more slowly than the former, it is clear that the increase in the number of ewes per acre on the high cost grassland is not fully proportionate to the increase in expenditure on grassland. Higher grazing costs are not offset by lower costs of supplementary feeding nor by a higher value of stock output; hence higher grass costs per acre tend to be associated with lower net margin per ewe.

It would be wrong, however, to conclude from this that high expenditure on grassland is generally uneconomic. What the figures in Table 7 show is that, with grazing costs shared out on the basis of livestock units and grazing days, and under conditions prevailing in 1954/5, the sheep enterprise did not seem to



derive any financial benefit from intensive manuring and cultivation of pastures and meadows. In fact, most farmers would probably agree that these improvements are carried out mainly for the benefit of cattle. This seems to be borne out by Table 8 which shows a decrease in the cost per acre as the ratio of sheep to cattle increases, up to the point where there are nearly thirteen sheep units for every ten cattle units. In the three groups which conform to this trend, the average cost of total feed, (i.e. supplementary feed + grazing) becomes less as the sheep-cattle ratio increases, either because the grazing cost per ewe is reduced or because the sheep are given a larger acreage to graze, thus enabling a saving on supplementary feed. The reduction in the feed cost per ewe results in a higher net margin showing that, within the range and period covered by these three groups, increasing sheep-cattle ratios were associated with rising net margin per ewe.

Table 8      Average Cost of Grass Production per Acre and certain  
Average Results per Ewe for 61 flocks arranged  
in order of Sheep-Cattle Ratio

No. of Flocks	15	15	15	16
Lambing Ratio	136	138	133	137
Sheep Units per 10 Cattle Units:				
Average	5.2	8.2	11.4	23.0
Range	3.3 - 6.7	7.0 - 9.9	10.4 - 12.8	13.1 - 40.3
Average Cost of Grass Prod'n per acre	£ s d	£ s d	£ s d	£ s d
	8 2 0	7 5 5	5 12 10	7 17 5
<u>RESULTS PER EWE:</u>				
Gross Margin	7 19 6	8 12 3	8 1 11	7 17 0
Supplementary Feed	1 12 6	1 1 7	1 5 11	1 16 1
Grazing	3 1 11	3 9 1	2 5 5	3 8 4
Total Feed (Suppl. Feed + Grazing)	4 14 5	4 10 8	3 11 4	5 4 5
Total Other* Inputs	7 6 7	6 9 2	5 5 7	7 2 3
Net Margin (Gross Margin - Total Other Inputs)	12 11	2 3 1	2 16 4	14 9

\* All inputs (including Feed) other than Stock Inputs.

Notes:

1. Only those items are included in the table which illustrate the relationship between Sheep-Cattle Ratio and financial results per ewe.
2. Two flocks are excluded because of insufficient information.

The fact that the fourth group, with the highest sheep-cattle ratio, does not fall into this pattern suggests that the apparent connection between profit on the sheep enterprise and the ratio of sheep to cattle, as described, may be somewhat

fortuitous. It is to be noted that in many respects, the sheep-cattle ratio apart, the first and fourth groups in Table 8 are similar to, rather than different from, each other. It could be held that these groups are formed of farms on potentially better land where the grass is more generously treated and fairly heavily stocked, whilst the other farms are perhaps poorer and more traditionally sheep carrying farms. The difference between the first and fourth groups is then largely that the first is made up of dairy farms which have a few subsidiary sheep whilst the fourth group - for reasons which are unconnected with elevation, soil, or grassland management - is composed of dairy farms with a substantial sheep enterprise. The complex of relationships involved will require considerably more study before it is clearly understood and its economic implications made plain.

One important fact which our figures do not bring out is that, to some extent, sheep - being close-grazing animals - consume grass which would otherwise be wasted. It has been suggested that a dairy farm could carry one ewe to each four acres of feed crops, without any additional expenditure on food.\* If this improved utilisation rate due to sheep could be taken into consideration in calculating sheep grazing costs, grazing cost per ewe would come out considerably lower than in the present survey and the apparent financial disadvantage to the sheep enterprise of high grassland expenditure would become less evident or even disappear.

#### 8. LABOUR

There was some evidence of the labour cost per ewe being higher in early-selling flocks (or in flocks where lambs were kept for the shortest period). Probably early fattening necessitated more labour both for supplementary feeding and for care of the flock.

Labour per ewe - especially attending to the lambing - would be expected to be higher in flocks with a higher lambing ratio. Since, however, the 'longwool' group had both a higher lambing ratio and lower supplementary feeding, these two factors seem to have neutralised each other, with the result that the labour cost per ewe was almost identical for the two breed groups.

Table 9                      Size of Flock and Labour Cost per Ewe

No. of Flocks	No. of Ewes	Labour per Ewe		
		£	s	d
10	under 30	1	3	10
34	30 - 100	1	0	4
19	over 100		16	4

A definite decrease in the cost of labour per ewe seems to result from an increase in the size of the ewe flock (Table 9). This is consistent with the

\* I. G. Reid, of Wye College, quoted in The Farmers Weekly of February 3rd 1956, p. 44.

economy of scale noticeable in many branches of production as it is with the common-sense observation that, once the job is started, not much additional time is needed to attend to a few extra sheep.

9. COST AND MARGIN PER FAT LAMB AND PER LB. OF FAT LAMB.

It is of obvious interest to know how much a fat lamb costs to produce, but this is difficult to determine accurately, for some proportion of the expenditure would have to be allocated to the production of hoggets, fat ewes and store lambs. Such an allocation is bound to be, to some extent, arbitrary; in order, therefore, to minimise its influence on the final result, it was decided to include in this calculation only those flocks from which at least half of the lambs were sold fat before the end of the accounting period. (The average percentage of lambs sold fat from these flocks is 79.8 per cent.)

Table 10 Average Cost and Margin per Fat Lamb and Cost per lb. of Lamb  
(43 Flocks from which 50% or more of the Lambs were sold fat.)

	PER FAT LAMB		
	£	s	d
<u>Stock Inputs -</u>			
Opening Valuation	8	1	0
Purchases	3	4	7
(a) Total	11	5	7
<u>Stock Outputs - (excluding fat lambs)</u>			
Sales	3	10	10
Closing Valuation	8	0	9
(b) Total	11	11	7
Gross Margin (b-a) (excluding fat lambs)		6	0
<u>Other Inputs -</u>			
Labour		18	7
Supplementary Feed	1	5	4
Grazing	2	19	0
Sundry Direct Costs (including Vet.)		5	10
Depreciation and Repairs (Specialised Equip.)			5
Share of General Farm Expenses		8	7
Transport and Marketing		4	5
Total Other Inputs	6	2	2
COST PER FAT LAMB (Total Other Inputs - Gross Margin excl. fat lambs)	5	16	2
FAT LAMB SALES	6	19	0
NET MARGIN (Fat Lamb Sales - Cost)	1	2	10
Cost per lb. of Lamb		2	7½
Average weight per Lamb		44.83 lbs.	
Total No. of Fat Lambs		4470	

The cost per fat lamb in these 43 flocks is taken to be the cost of "other inputs" (adjusted for any production other than fat lambs) divided by the number of fat lambs sold. This cost is in turn divided by the average dressed carcass weight of lambs sold to obtain the cost per lb. of fat lamb.

Table 11      Average Cost and Margin per Fat Lamb and Cost per lb. of Lamb for Two Breed Groups

(Flocks from which 50% or more of the lambs were sold fat)

Group	Longwool			Shortwool		
No. of Flocks	13			13		
	£	s	d	£	s	d
Cost per Fat Lamb	6	2	2	6	13	7
Receipts per Fat Lamb	6	15	9	7	6	0
Net Margin per Fat Lamb	13 7			12 5		
Cost per lb. of Lamb	2 9			3 0		
Average weight per Lamb	45.05 lbs.			45.55 lbs.		
Total No. of Fat Lambs	1349			1113		

Since the proportion of lambs sold fat within the year varied widely between flocks, any comparison of results on a fat lamb basis can have only limited value. Nevertheless, Table 11 shows a fair correspondence with the results per ewe quoted earlier in that 'longwool' flocks obtained a slightly higher margin per lamb than the 'shortwool' flocks.

#### 10. CONCLUSIONS

Any conclusions reached through a study of the results contained in this bulletin can be only of a tentative and interim character. Sheep farming is too complicated a business for any firm economic judgement to be based on one year's observations. Nevertheless, it may be of interest to bring together some of the impressions scattered in the preceding pages.

- 1) It seems that a high ratio of lambs reared per ewe is of major importance to economic success. Ewes with 'longwool' blood gave the better results in 1954/5.
- 2) High cost lamb production for the early high priced market proved less profitable in 1954/5 than fattening rather heavier lambs more cheaply off grass for the later and lower priced market.
- 3) Additional expenditure on grassland did not appear to benefit the sheep enterprise: it must be remembered, however, that cattle would almost certainly derive advantage from better



grassland management and that in a different season the grass itself might show greater response to the application of fertilisers.

- 4) Larger flocks do not require a proportionate increase in labour hours.
- 5) Almost 62 acres of land were required to provide food for each 100 ewes and their lambs -  $57\frac{1}{4}$  acres of grassland,  $1\frac{1}{2}$  acres of fodder crops, 3 acres equivalent in purchased concentrates.

## APPENDIX I

### Definitions of terms used

#### A. Terms describing sheep.

Breeds. For the purpose of Table 1 breeds have been classified as follows:-

Longwool: Border Leicester, Teeswater, Wensleydale.  
Shortwool: Clun, Hampshire, Kerry, Oxford, Shropshire, Suffolk.  
Mountain: Cheviot, Gritstone, Scotch Blackface, Swaledale,  
Welsh Mountain.

The method of classifying the flocks into the 'longwool' and the 'shortwool' group is explained in Table 1 and the accompanying text.

Ewes include shearlings put to ram. Results per ewe were calculated on the basis of the number of ewes put to ram on the farm or bought with their lambs and any in-lamb ewes purchased.

Rams include shearlings.

Lambs. Except in the Opening Valuation, this term refers only to sheep born in 1955.

"Other Sheep" consist of (a) sheep born in 1954 - except in the Opening Valuation, where they are called "lambs", and in the Closing Valuation, when they become "ewes" or "rams" if intended for breeding in 1955-56; and (b) ewes not put to ram in 1954 (i.e. kept for fattening only).

#### B. Accounting Terms

"Purchases" include cost of carriage to the farm.

"Sales" cover total receipts for sheep and wool sold, including deficiency payments, before any deductions have been made for carriage, handling or commission.

Labour cost includes a share of the value of perquisites and an allowance (4d. per man-hour) to cover the cost of National Insurance and holidays.

Home Grown Feed costs are based on average costs of production calculated in other surveys.

#### Grazing:

- 1) The total cost of grass production was calculated by normal crop cost procedures; where appropriate, a

deduction from this total cost was made for the acreage conserved.

- 2) The grazing cost so arrived at was divided amongst the grazing livestock on the farm according to the "livestock grazing days" attributable to each category. For this purpose stock were given the following unit values:-

Dairy Stock	2 years & over:	1 unit	Horses	$1\frac{1}{2}$ unit
	1 - 2 " :	$\frac{2}{3}$ "	Lambs	$\frac{1}{8}$ "
	under 1 " :	$\frac{1}{3}$ "	Other	
			Sheep	$\frac{1}{4}$ "

- 3) Any payment for grazing by sheep off the farm was added to the farm grazing to arrive at total Sheep Grazing Cost.

Sundry Direct Costs consist mainly of expenditure on veterinary preparations and treatment but include also running and depreciation cost of tractors used for carting food to the sheep.

Share of General Farm Expenses is calculated as 15 per cent. of the cost of direct labour plus 5 per cent. of total other inputs (inclusive of the 15 per cent. of labour cost).

Transport and Marketing costs are those incurred in selling the sheep.

#### C. Other Terms

Lambing Ratio =  $\frac{\text{No. of home-bred lambs reared} + \text{No. of lambs bought with ewes}}{\text{No. of "ewes put to ram"}}$  x 100

(See above, "Per Ewe")

Weights refer to dressed carcase weight.

Sheep-Cattle Ratio. This is based on the ratio of sheep to cattle on each farm on 1st October 1954 and claims only to give a general indication of the variations between farms. A cattle unit is the equivalent of one cow. A sheep unit is the equivalent of one ewe.

Averages are simple (per farm).

APPENDIX II

Standard Form of Financial Results

Based on records of 63 enterprises averaging 90.90 ewes put to ram per enterprise.

Table 1. Gross Margin

	<u>Per Ewe</u>						<u>Per Ewe</u>		
	£	s	d	£	s	d	£	s	d
<u>Stock Inputs -</u>									
Opening Valuation -									
Ewes (breeding)	7	16	7						
Rams		8	11						
Lambs		11	1						
Other Sheep			7						
	<hr/>								
Total			<u>8</u>	<u>17</u>	<u>2</u>				
<u>Stock Outputs -</u>									
Sales -									
Ewes		1	11						
Rams									8
Lambs		7	3						4
Other Sheep									11
Wool		1	7						1
	<hr/>								
Total									<u>10</u>
									<u>13</u>
									<u>9</u>
<u>Purchases -</u>									
Ewes (breeding)	2	13	1						
Rams		2	0						
Lambs	1	3	8						
Other Sheep		1	4						
	<hr/>								
Total			<u>4</u>	<u>0</u>	<u>1</u>				
<u>Closing Valuation -</u>									
Ewes (breeding)	6	14	3						
Rams		7	8						
Lambs	3	1	9						
Other Sheep		1	4						
	<hr/>								
Total									<u>10</u>
									<u>5</u>
									<u>0</u>
(a) TOTAL STOCK INPUTS			<u>12</u>	<u>17</u>	<u>3</u>	(b) TOTAL STOCK OUTPUTS			<u>20</u>
(c) GROSS MARGIN (b-a)			<u>8</u>	<u>1</u>	<u>6</u>				<u>18</u>

Table 2. Net Margin

	<u>OTHER INPUTS</u>			<u>Per Ewe</u>		
	£	s	d	£	s	d
Labour				6½	Hrs.	19 8
Feed - Purchased Concentrates				0.60	cwt.	19 6
" Other				-	-	-
- Home Grown Concentrates				0.19	cwt.	3 5
" " Roots				1.21	"	3 3
" " Silage				0.25	"	8
" " Hay				0.29	"	2 2
- Grazing						<u>3 0 2</u>
Total Feed						4 9 2
Rent (Specialised Buildings or Land)						- - -
Sundry Direct Costs (including Vet.)						6 9
Depreciation and Repairs (Specialised Equip.)						5
Share of General Farm Expenses						9 2
Transport and Marketing Charges						<u>4 4</u>
TOTAL OTHER INPUTS						<u>6 9 6</u>
Net Margin (Gross Margin - Total Other Inputs)						<u>1 12 0</u>



GENERAL

Statement of Financial Results

Based on records of 63 sheepskins weighing 30.00 average to two per centimeter.

Table 1. Sheepskins

Per Skin		Per Hundred	
Wool	1.71	171	
Other Sheep	1.12	112	
Total	2.83	283	
Wool	1.71	171	
Other Sheep	1.12	112	
Total	2.83	283	
Wool	1.71	171	
Other Sheep	1.12	112	
Total	2.83	283	

Table 2. Sheepskins

Per Skin		Per Hundred	
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