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Agricultural Economics Division

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**Economics
of Sheep Production
on Mixed Farms
in Aberdeen, Banff
and Kincardine
1965/66 and 1966/67**

by

R. J. ISAACS, B.Agr.Sc. (N.Z.), Dip.F.M. (Leeds)

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THE NORTH OF SCOTLAND COLLEGE OF AGRICULTURE
AGRICULTURAL ECONOMICS DIVISION

ECONOMICS OF SHEEP PRODUCTION ON MIXED FARMS
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<u>CONTENTS</u>	<u>PAGE</u>
<u>SUMMARY</u>	1
<u>INTRODUCTION</u>	3
Scope of Report	3
Sheep Population	3
Marketing Conditions During the Period	
Under Review	4
Climatic Conditions During Period Under	
Review	7
Collection and Compilation of Data	7
<u>THE SAMPLE</u>	8
General	8
Types of Farm in Survey	9
Cropping and Stocking of Farms In The Sample	10
The Role of Sheep In The Farm Business	11
<u>TYPES OF SHEEP PRODUCTION</u>	13
Production of Early Fat Lambs	14
Late Fat Lamb Production	14
Store Lamb Production	14
Production of Breeding Lambs	14
Other Flocks	14
Breeding of Ram Lambs	14
Purchase of Ewes in Autumn, Sale of Ewes	
With Lambs at Foot in Spring	15
Combined Hill-Lowland Flock	15
Breeds Used	16
<u>OUTPUT, VARIABLE COSTS AND GROSS</u> <u>MARGINS FROM EWE FLOCKS</u>	17
<u>FIXED COSTS AND PROFIT</u>	24
<u>FACTORS AFFECTING RETURNS FROM</u> <u>SHEEP ENTERPRISES</u>	25
<u>LAMBING PERFORMANCE</u>	25
Lambing Percentages by Activities	25
Influence of Lambing Percentage on Gross Margins	27
Influence of Breeding from Ewe Lambs on	
Lambing Percentages and Gross Margins	28
Influence of Time of Lambing on Lambing	
Percentages and Gross Margins	28
Influence of Breed on Lambing Percentages	29
Flushing	30
General Breeding Management	30

	<u>PAGE</u>
<u>VALUE OF LAMBS</u>	33
Time of Sale and Type of Lamb Sold	33
Selling Prices for Lambs	34
Weights at Time of Sale	38
Factors Affecting Time and Type of Sale	39
Market v. Slaughterhouse Sales	40
<u>VALUE OF WOOL AND ASPECTS OF WOOL PRODUCTION</u>	41
<u>GRAZING AND FORAGE UTILISATION</u>	42
<u>MORTALITY OF EWES AND LAMBS AND ANIMAL HEALTH</u>	47
<u>FLOCK REPLACEMENT AND CULLING AND FLOCK DEPRECIATION</u>	49
<u>SUPPLEMENTARY FEEDING IN EWE FLOCKS</u>	55
<u>LABOUR</u>	58
<u>MISCELLANEOUS VARIABLE COSTS</u>	61
<u>COMPARISON BETWEEN BEST AND WORST BREEDING EWE FLOCKS</u>	62
<u>OTHER FLOCKS</u>	68
<u>CHANGES IN POLICY</u>	71
Reduction in Scale of Sheep Enterprise	71
Elimination of Sheep from the Farm Business	71
Expansion in Scale of Sheep Enterprise	72
Change of Breed	72
Change in Activity	73
Change in Replacement Policy	74
Summary	74
<u>PRODUCTION OF FAT LAMBS AND HOGGETS IN THE WINTER AND AUTUMN PERIOD</u>	76
Activities	76
Output, Variable Costs and Gross Margins	77
Opening Valuation and Purchase of Sheep	80
Selling Prices	81
Feeding	82
Animal Health	83
Fixed Costs and Profits	83
<u>APPENDIX I Tables</u>	85
<u>APPENDIX II Statistical Coefficients</u>	90
<u>APPENDIX III Accounting Methods and Definitions</u>	94

(iii)

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Numbers of Sheep in Aberdeen, Banff and Kincardine and in Scotland, June 1966	3
2	Numbers of Sheep in Aberdeen, Banff and Kincardine and in Scotland, June 1967	4
3	Weighted Average Prices per lb. C.D.W. to Producer for Live Fat Hoggets and Fat Lambs - Selected Grades and Markets, October 1965 to September 1967	5
4	Average Prices per lb. Selected Grades Fat Hoggets and Lambs for Slaughter, October 1965 to September 1967	6
5	Average Price per lamb for Store Lambs, August - September, 1965 - 1967 Selected Markets	6
6	Distribution of Farms in the Survey by Altitude	8
7	Size of Ewe Flocks in Relation to Size of Farm 1966/67	9
8	Total Grazing Livestock Units Per Farm and Percentage Distribution of Livestock Units	11
9	Distribution of Flocks According to Percentage of Total Gross Output represented by Sheep, 1966/67	12
10	Relationship of Net Farm Income per Acre to Sheep Output as a Percentage of Total Gross Output	12
11	Reasons Given by Farmers for Inclusion of Sheep in the Farm Business	13
12	Average Output, Variable Costs and Gross Margin per Ewe by System of Production, 1965/66	19
13	Average Output, Variable Costs and Gross Margin per Ewe by System of Production, 1966/67	20
14	Average Gross Margin and Carrying Capacity by System of Production, 1965/66	21

<u>Table</u>		<u>Page</u>
15	Average Gross Margin and Carrying Capacity by System of Production, 1966/67	21
16	Comparison of Average Gross Margins from Ewe Enterprises with Average Gross Margins for Farms as a Whole, 1965/66	22
17	Comparison of Average Gross Margins from Ewe Enterprises with Average Gross Margins for Farms as a Whole, 1966/67	23
18	Distribution of Ewe Flocks in Sample by Average Gross Margin per Acre, 1965/66	23
19	Distribution of Ewe Flocks in Sample by Average Gross Margin per Acre, 1966/67	23
20	Average Gross Margin, Fixed Costs and Profit or Loss per Forage Acre, 1965/66	24
21	Average Gross Margin, Fixed Costs and Profit per Forage Acre, 1966/67	24
22	Average Lambing Percentage per Flock by System of Production, 1966/67	26
23	Distribution of Flocks According to Time of Main Lambing by Systems of Production, 1966/67	26
24	The relationship of Gross Margins to Lambing Percentage, 1966/67	27
25	Lambing Percentage and Gross Margins of Flocks Breeding from Ewe Lambs and of Other Flocks, 1966/67	28
26	Lambing Percentage and Gross Margins in Relation to Time of Main Lambing, 1966/67	29
27	Lambing Percentage According to Breed of Ewe, 1966/67	30
28	Performance 10 Best and 11 Worst Flocks judged on Lambing Percentage, 1966/67	31
29	Disposal of Lambs from Breeding Flocks by System of Production, 1966/67	33
30	Average Monthly Prices Per Lamb by System of Production, 1966/67	35
31	Average Sale Price of Fat Lambs and Fat Hoggets Sold (including purchased lambs) by month 1965/66 and 1966/67	36

<u>Table</u>		<u>Page</u>
32	Average Selling Prices of Fat Lambs, Fat Hoggets and Store Lambs by Breed, 1965/66 and 1966/67	37
33	Average Equivalent Deadweights by Month of Sale of Fat Lambs by System of Production, 1966/67	38
34	Average Equivalent Deadweights by Month of Sale by Breed, 1966/67	39
35	Output of Wool as a Percentage of Total Output from Sheep and Wool, 1966/67	41
36	Average Wool Weights and Prices per lb. by Breed, 1966/67	41
37	Relationship of Stocking Rates and Gross Margins, 1966/67	43
38	Systems of Winter Grazing Management	45
39	Systems of Summer Grazing Management	45
40	Losses of Lambs, 1966/67	47
41	Average Flock Depreciation per Ewe 1965/66 and 1966/67	49
42	Methods of Replacement and Culling	50
43	Rate of Turnover of Ewes by Normal Type of Purchase, 1965/66 and 1966/67	50
44	Average Purchase Prices of Ewe Replacements by Breed, 1966 and 1967	52
45	Average Selling Prices of Cull Ewes by Breed, 1966 and 1967	53
46	Overall Purchase Prices of Ram Replacements 1966 and 1967	54
47	Average Quantities of Supplementary Foods Consumed per Ewe, 1966/67	55
48	Average Variable Costs of Supplementary Foods Fed Per Ewe, 1966/67	56
49	Cost of Grain, Concentrates and Draff per Ewe and Gross Margins per Ewe and Per Acre, 1966/67	58

<u>Table</u>	<u>Page</u>
50 Average Monthly Labour Requirements per Ewe by Type of Production, 1966/67	59
51 Average Monthly Labour Requirements per Ewe by Month of Lambing, 1966/67	60
52 Average Labour Requirements per Breeding Ewe in Relation to Size of Flock	61
53 Average Output, Variable Costs and Gross Margin per Ewe for Best 12 and Worst 12 Flocks, 1966/67	64
54 Average Values of Lambs Sold or on Hand at 30.9.67. Best 12 and Worst 12 Flocks	66
55 Amounts of Supplementary Foods Fed Per Ewe to Best 12 Flocks and Worst 12 Flocks, 1966/67	66
56 Average Rates of Application of Nitrogen to Grazing, Hay and Silage and Average Stocking Rates, Best 12 and Worst 12 Flocks, 1966/67	67
57 Average Output, Variable Costs and Gross Margin per Lamb for Autumn and Wintered Fattened Sheep, 1966/67	78
58 Average Output, Variable Costs and Gross Margin per lamb for Autumn and Winter Fattened Sheep, 1966/67 (All lambs purchased)	79
59 Average Purchase Price of All Lambs by Breed, 1966/67	80
60 Average Selling Price of All Fat Lambs and Hoggets by Breed	81
61 Average Quantities of Supplementary Foods Consumed per Lamb for Autumn and Winter Fattened Lambs, 1966/67	82
62 Average Output, Variable Costs, Gross Margin, Fixed Costs and Profit per Lamb for Autumn and Winter Fattened Sheep, 1966/67	84
63 Average Output, Variable Costs, Gross Margin, Fixed Costs and Profit per Lamb for Autumn and Winter Fattened Sheep, 1966/67 (All Lambs Purchased)	84

<u>Table</u>	<u>Page</u>
<u>APPENDIX I</u>	
(i) Average Cropping Per Farm, 1967	85
(ii) Percentage Distribution of Cropping, 1967	86
(iii) Livestock Numbers per Farm, 1966/67	87
(iv) Breed Crosses Used in Ewe Flocks by Number of Farms 1966/67	88
(v) Number of Ewes in Survey by Breeds, 1966/67	89
(vi) Number of Rams in Survey by Breeds, 1966/67	89
<u>APPENDIX II</u>	
Statistical Coefficients	90

ECONOMICS OF SHEEP PRODUCTION ON MIXED FARMS
IN ABERDEEN, BANFF AND KINCARDINE

1965/66 and 1966/67

SUMMARY

1. The survey covered 63 mixed farms over a period of two years from October, 1965 to September, 1967. In all cases sheep were very much subsidiary to other enterprises on the farms. The basic objectives of the investigation were the identification of activities and derivation of gross margin and management information.
2. In terms of end product and time of sale, a wide range of activities within the sheep enterprises was identified, 15 in all.
3. In ewe flocks, the gross margin per ewe averaged £4 18s. 0d. for 51 flocks in 1965/66 and £6 16s. 6d. for 56 flocks in 1966/67.
4. For these flocks the gross margin per forage acre averaged £13 0s. 6d. in 1965/66 and £16 17s. 6d. in 1966/67. These figures compared with average whole farm gross margins of £26 15s. 6d. and £27 5s. 6d. respectively for the two years.
5. The lambing percentage (i.e. the number of lambs docked as a percentage of ewes tupped) for 51 flocks in 1966/67 averaged 147. Four-fifths of these flocks lambed in March or April. The average lambing percentage of nine flocks in the sample which included ewe lambs put to the tup was 116 per cent in 1966/67.
6. Flocks with Half-bred ewes had the highest average lambing percentage.
7. Gross margins per ewe and per acre increased as the lambing percentage increased.
8. Only 24 per cent of the lambs born in 1967 were sold before 30th September in that year. Thirty nine per cent of lambs from ewe breeding flocks in the sample were sold as stores.
9. The average deadweight equivalent of lambs sold fat very closely approximated 50 lb., and this applied irrespective of the time of sale.

10. Stocking rates for the whole year averaged 2.5 ewes per forage acre in both years. These comparatively low stocking rates have an important influence on gross margins per forage acre. It has to be remembered, however, that on many farms sheep were playing a predominantly scavenging rôle.
11. Losses of ewes, dead or unaccounted for, averaged 4.7 per cent per flock in 1966/67. An average of 7.2 per cent of lambs was lost before docking and 1.2 per cent afterwards.
12. On an annual basis, flock depreciation per ewe averaged £1 13s. 6d. in 1965/66 and 11s. 0d. in 1966/67, these figures being greatly influenced by valuation changes affected by market trends.
13. Feeding of concentrates and grain averaged 106 lb. per ewe in 1966/67 and, in addition, 47 lb. of draff was fed. Hay and silage consumption was negligible and root consumption averaged 9.0 cwt. per ewe.
14. On all but three farms in the sample, family labour, usually the farmer himself, was responsible for shepherding duties. The average annual labour requirement per ewe was 5.41 hours. Labour requirements per ewe decreased with increasing size of flock.
15. The farms in the sample were in a fairly fluid state of policy change over the past ten years. Only nine of the 63 farmers interviewed had not effected some change in policy during this period.
16. For lambs fattened over the autumn and winter period, the gross margin per lamb averaged £1 0s. 0d. for 31 flocks in 1966/67. When fixed costs were taken into account a loss of 1s. 0d. per head was recorded.
17. Statistical coefficients for certain of the tables have been calculated and have been included at Appendix II. An indication of accounting methods employed and definition of terms employed in the report are discussed in Appendix III.

ECONOMICS OF SHEEP PRODUCTION ON MIXED FARMS IN ABERDEEN, BANFF AND KINCARDINE

1965/66 and 1966/67

INTRODUCTION

Scope of Report

This report studies the economics of small sheep units kept on mixed farms in the counties of Aberdeen, Banff and Kincardine during the two years October 1st, 1965 to September 30th, 1966 and October 1st, 1966 to September 30th, 1967, and is based on a survey of 63 farms in these counties. The main objective of the study was the identification of the different sheep production activities on the farms and derivation of gross margins appropriate to these activities.

Accounting methods and definitions are set out in Appendix III.

Sheep Population

The numbers of sheep in the three counties as at June 1966 and June 1967, together with the figures for the whole of Scotland are given in Tables 1 and 2.

Table 1 Numbers of Sheep in Aberdeen, Banff and Kincardine
and in Scotland, June 1966

Area \ Class of sheep	Ewes for Breeding	Rams for Service	Other sheep 1 year old and over		Other Sheep under 1 year old	Total Sheep
			For Breeding	Other		
Aberdeen	169,431	6,015	38,128	12,855	245,411	471,840
Banff	56,244	1,940	9,484	5,343	77,193	150,204
Kincardine	28,846	1,000	4,428	1,880	39,800	75,954
Total	254,521	8,955	52,040	20,078	362,404	697,998
Scotland	3,603,643	109,634	823,225	210,638	3,629,698	8,376,838

Source: Department of Agriculture and Fisheries for Scotland, Census June 1966.

Table 2 Numbers of Sheep in Aberdeen, Banff and Kincardine and in Scotland
June 1967

Area \ Class of sheep	Ewes for Breeding	Rams for Service	Other Sheep 1 year old and over		Other Sheep under 1 year old	Total Sheep
			For Breeding	Other		
Aberdeen	158,716	5,717	27,896	10,233	230,281	432,843
Banff	54,672	1,916	6,324	4,604	74,290	141,806
Kincardine	25,226	911	3,382	1,220	35,818	66,557
Total	238,614	8,544	37,602	16,057	340,389	641,206
Scotland	3,528,331	105,044	758,667	201,586	3,618,274	8,211,902

Source: Department of Agriculture and Fisheries for Scotland, Census June 1967.

In 1966 sheep in the counties of Aberdeen, Banff and Kincardine comprised 7.8 per cent of Scotland's total sheep population. The census for June 1964 showed a total sheep population for the three counties of 696,836. The figures remained fairly static around this level in 1965 and 1966, but between 1966 and 1967 there was a drop of 56,792, i.e. of 8.1 per cent. This compares with a corresponding drop of 2.0 per cent for Scotland as a whole.

Marketing Conditions during the Period under Review

Discussion of marketing conditions over the period of the survey involves consideration of the guaranteed price for sheep and the actual inclusive prices received by producers. The average guaranteed prices for fat sheep and lambs for the three years falling within the investigation period were:-

1965/66	(April 1965 - March 1966)	3s.2d.
1966/67	(April 1966 - March 1967)	3s.2½d.
1967/68	(April 1967 - March 1968)	3s.3½d.

In order to give an indication of actual inclusive prices received by producers, Table 3 has been compiled utilising information presented in the weekly agricultural market reports of the Department of Agriculture and Fisheries for Scotland, which cover 12 representative markets. The average prices realised at these markets for certain grades of fat lambs and hoggets have been taken and to these have been added the rate of guarantee payment for the week concerned. The actual average monthly realisation has then been calculated on a weighted basis. The two classes selected for this calculation were fat hoggets of 46 - 60 lb. from January to June and fat lambs in the same weight range from July to December. To give a more complete picture slaughter-house prices (inclusive of guarantee) paid by one of the major meat companies are presented in Table 4. These prices relate to hoggets in the 45 - 48 lb. weight range from January to June and lambs in the 46 - 50 lb. weight range from July to December. These latter figures are on an unweighted basis.

Table 3 Weighted Average Prices per lb, C.D.W, to Producer for Live Fat Hoggets and Fat Lambs - Selected Grades and Markets, October 1965 to September 1967
(pence per lb.)

Month	Year	
	1965/66	1966/67
October	35.78	35.66
November	37.07	35.02
December	37.36	36.05
January	37.53	37.54
February	38.73	39.93
March	42.31	43.10
April	43.47	44.51
May	44.65	42.16
June	38.93	38.42
July	40.55	40.37
August	36.37	35.18
September	35.95	35.08

Based on: Weekly Agricultural Market Reports of Department of Agriculture and Fisheries for Scotland.

Table 4 Average Prices per lb. Selected Grades Fat Hoggets and Lambs
For Slaughter, October 1965 to September 1967
(pence per lb.)

Month	Year	
	1965/66	1966/67
October	32.75	33.30
November	34.25	33.30
December	35.75	34.60
January	37.71	37.56
February	38.00	39.50
March	40.69	42.62
April	42.00	43.06
May	44.87	41.50
June	42.17	37.06
July	39.80	38.95
August	36.00	33.50
September	32.87	33.75

Extracted from Price Reports in Farming News

Study of these tables does not reveal any significant upward trend in prices received for fat hoggets and lambs by farmers, despite the increase in guaranteed price. This point is examined later in the report for farms in the survey itself.

As far as store lambs are concerned there was a drop in prices in 1966, but this was not repeated in 1967, except for Half-breds. Table 5 gives the weighted average price per store lamb sold in August - September for the three years 1965, 1966 and 1967 at representative markets covered by the Weekly Agricultural Market Report prepared by the Department of Agriculture and Fisheries for Scotland.

Table 5 Average Price per Lamb for Store Lambs, August - September, 1965 - 1967.
Selected Markets

Breed	1965	1966	1967
	s. d.	s. d.	s. d.
Blackface	79: 6	71: 6	74: 7
Cheviot	97: 6	77: 7	92: 1
Half-bred	165: 2	153: 5	135: 2
Greyface	107: 8	103: 1	107: 2
Down Cross	143: -	135: 8	138: 6

Based on: Weekly Agricultural Market Reports of Department of Agriculture and Fisheries for Scotland.

There was also a drop in prices paid for breeding sheep, both female and male in 1966, but there was some recovery in 1967.

Climatic Conditions During Period under Review

The 1965/66 winter was a long and severe one and was followed by a late start to spring growth in 1966. However, later, spring provided more rapid growing conditions which continued throughout the summer and well into the autumn of 1966. In contrast to the previous year the winter of 1966/67 was less severe, with an absence of prolonged heavy snowfalls at the lower levels in the area covered by the survey. This meant that supplementary feed requirements were less than in the previous winter. However May 1967, proved to be a wet and cold month with a marked slowing down in grass growth. This was followed by an unusually dry summer and grass growth suffered in places, although no deleterious effect on the sheep enterprise was reported.

Collection and Compilation of Data

Visits to farms in the sample were made in the period between April 1967 and March 1968, and as well as compiling figures for the 1966/67 season, an attempt has been made to derive gross margins and other relevant information for the previous season, October 1st 1965 to September 30th, 1966. The survey was conducted mainly on a question-and-answer basis, supported by information derived from the financial accounts of the farms concerned, and little in the way of additional records was required to be maintained by the farmers co-operating in the survey. It should be stated that access was available to the financial accounts relating to farms covered by the survey.

THE SAMPLE

General

The sample for the survey comprised 63 farms, which were either participating in the Financial Accounts Scheme of the Agricultural Economics Division of the North of Scotland College of Agriculture or had participated in this scheme in the past. An indication of the altitude at which steadings of farms in the sample are situated is given in Table 6.

Table 6

Distribution of Farms in the Survey by Altitude

Height above Sea Level	Number of Farms
0 - 100 feet	5
101 - 200	14
201 - 300	18
301 - 400	8
401 - 500	7
501 - 600	2
601 - 700	4
701 - 800	4
801 - 900	2
901 - 1,000	-
over 1,000	3
Total	63

Derived from Ordnance Survey Maps.

The flocks were located on farms which ranged in size from 47 acres to 1,692 acres. Thirty five of the farms were tenanted and 28 owner-occupied. The average rent per acre on the rented farms was £2 18s. in the 1965/66 financial year and £3 2s. in 1966/67, ranging from 18s. per acre to £5 8s. in 1966/67.

For farms carrying ewe flocks in 1966/67 the distribution by size of farm and size of ewe flock is given in Table 7.

Table 7

Size of Ewe Flocks in Relation to Size of Farm 1966/67

Size of Farm	Number of Ewes in Flock					All Flocks
	50 and under	51 - 100	101 - 150	151 - 200	Over 200	
	No. of Flocks	No. of Flocks	No. of Flocks	No. of Flocks	No. of Flocks	No. of Flocks
Under 75 acres	4	-	-	-	-	4
76 - 100 "	5	1	1	-	-	7
101 - 150 "	9	5	1	-	-	15
150 - 300 "	2	10	6	2	2	22
Over 300 "	-	-	2	3	3	8
Totals	20	16	10	5	5	56

The total number of ewes in the sample was 5,247 for the 1965/66 season and 5,894 for 1966/67, the average number of ewes being 103 and 105 per flock respectively. In addition the performance of 744 winter fattened lambs on 6 farms not carrying ewes was investigated in 1966/67.

Types of Farm in Survey

The selection of farms for the sample was made from Groups III, IV and V of the Financial Accounts Scheme, most farms with sheep in these groups being included. Group III - Mixed Farms (Cattle and Sheep) - consists of farms where the output from cattle and sheep together contributes at least 50 per cent of total farm output, and where rough grazing does not exceed 30 per cent of the total farm land area. Group IV - Mixed Farms (Arable) - contains farms where the management is based on livestock, but where greater emphasis is placed on the rôle of crop products which contribute at least 35 per cent of total output. Group V - Mixed Farms (Intensive Pigs and Poultry) - comprises mixed farms where the output from pigs and poultry makes up at least 25 per cent of total output.

The number of farms in the sample from each group is shown below:-

Group III - Mixed Farms (Cattle and Sheep)	44
Group IV - Mixed Farms (Arable)	8
Group V - Mixed Farms (Intensive Pigs and Poultry)	10
Not Grouped	<u>1</u>
Total	<u>63</u>

Cropping and Stocking of Farms in the Sample

The average acreage of the 63 farms participating in the survey was 207 acres in the 1967 cropping year. Table (i) in Appendix I gives the actual crops and grass acreage in each main sub-division in the sample, while Table (ii) of this Appendix converts these actual acreages into percentages.

Grass covers 55.7 per cent of the total acreage of all farms, ranging closely around this figure for all types with the exception of that where the sheep enterprise is comprised of lambs purchased for winter fattening and no ewe flock is carried. The average grass acreage on these farms is 41.7 per cent of total farm acreage, while oats and barley occupy 46.7 per cent of the total area, compared with the average of 34.6 per cent for all farms. Barley is the most important crop enterprise on the farms in the sample.

The average stocking of the farms at the beginning of the 1966/67 season is shown in Appendix I, Table (iii). The figures for 'other sheep' referred to in this table are lambs born during 1966.

These figures are converted into livestock unit equivalents for cattle and sheep in Table 8 as follows. The definition of each type of sheep production is given in a subsequent section.

Table 8

Total Grazing Livestock Units Per Farm and Percentage
Distribution of Livestock Units

	Type of Sheep Production							
	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Ewe Flock Enterprise	Other Flocks	Purchased Lambs Only	All Farms
Number of Farms	14	12	17	5	8	1	6	63
Total Cattle Livestock Units	48.5	80.9	53.5	55.9	105.4	11.3	46.5	63.1
Total Sheep Livestock Units	12.9	31.9	29.2	21.2	27.2	2.2	6.1	22.5
<u>Grazing Livestock Units</u>	%	%	%	%	%	%	%	%
Cattle	79.0	71.7	64.7	72.5	79.5	83.7	88.4	73.7
Sheep	21.0	28.3	35.3	27.5	20.5	16.3	11.6	26.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

The Role of Sheep in the Farm Business

For all farms in the sample, sheep at this particular time of year comprise an average of 26.3 per cent of the total grazing livestock units. Except for one farm figuring in the section "other ewe flock enterprises" total dairy cow numbers are of no significance on any farm. Sheep play very much of a subsidiary rôle to production of beef of one sort or another, combined in some cases with cash cropping and pig production. Further evidence of the comparative unimportance of sheep on these farms is provided by assessing the proportion of total output provided by the sheep enterprise. For 56 farms in 1966/67, gross output from sheep and wool averaged only 12 per cent of the total gross output for the whole farm. Table 9 gives the distribution of flocks according to the percentage of total gross output represented by sheep. (Both the sheep output and the total gross output figures have been extracted from the financial accounts of the farms concerned).

Table 9

Distribution of Flocks according to Percentage of
Total Gross Output represented by Sheep, 1966/67

Sheep Output as a % of Total Gross Output	Flocks	
	No.	%
0 - 5.0	10	17.9
5.1 - 10.0	15	26.8
10.1 - 15.0	17	30.3
15.1 - 20.0	8	14.3
More than 20.0	6	10.7
Total	56	100.0

The comparatively minor rôle played by sheep in the economy of these farm businesses is perhaps explained by the fact that there is a realisation amongst many of the farmers that the sheep enterprise is less profitable than other enterprises on the farm. In many cases the sheep enterprise is maintained in a complementary scavenging rôle. Table 10 shows that in this sample there is a tendency for the higher the contribution made by sheep to total gross output, the lower the net farm income per acre.

Table 10

Relationship of Net Farm Income per Acre to Sheep Output *
as a Percentage of Total Gross Output

Sheep Output as a % of Total Gross Output	1966/67 Average Net Farm Income per Acre
0 - 5.0	£ 14.5
5.1 - 10.0	12.4
10.1 - 15.0	8.6
15.1 - 20.0	5.9
More than 20	4.2

* See Appendix II for correlation coefficient

It is of some interest that taking all the 63 farms in the sample, the average length of time the farmer or partnership had been in charge of the unit was 17 years, and that the average period of time that sheep had been kept on the farm was 15 years. Many farmers had been on their property for longer periods than this, but in a filial relationship.

On all farms visited an attempt was made to assess the farmer's reason for the inclusion of sheep in the farm business. These reasons are presented in summary form in Table 11.

Table 11 Reasons Given by Farmers for Inclusion of Sheep in the Farm Business

Main Reason Offered	Number of Farms
As scavengers or mixed grazers with cattle	17
Diversification	5
Interest and liking for sheep by farmer	4
Fit in well with labour patterns	3
No facilities available for cattle	3
Utilisation of adjacent hill grazing	1
Traditional	2
Sheep contribute significantly to overall profits	14
No reason offered	14

In summary, it can be said that in most cases these small sheep flocks are maintained in a complementary rôle to afford effective utilisation of resources which might otherwise be wasted.

TYPES OF SHEEP PRODUCTION

A significant feature arising from the survey was the wide range of different activities represented by the sheep enterprises in the sample. The procedure used in defining activities for the purpose of comparison in this report is one based mainly upon the type of end product produced and partly upon time of sale. This in itself allowed the identification of fifteen activities. If other factors, for example, breeds used, time of lambing, feeding regimes and replacement policies were also to be taken into account, the number of individual activities which could be differentiated would have been increased considerably with, in a sample of this size, even fewer flocks in each.

On many of the farms with breeding ewe flocks only a proportion of the lambs were sold during the summer months. Accordingly, in the financial statements in this report, those on hand at the end of September were credited to the ewe enterprise at valuation, and separate activities raised for lambs sold after this date.

The following breeding ewe flock activities have been defined in the study:-

Production of Early Fat Lambs

Sale of the majority of lambs fat before September 30th. (Production of very early light fat lambs for specialised trades such as the Easter market was not encountered). There were nine flocks falling in this category in 1965/66 and 14 in 1966/67.

Late Fat Lamb Production

Sale of the majority of the lambs fat after September 30th (21 farms in 1965/66 and 12 in 1966/67.)

Store Lamb Production

Sale of the majority of lambs as stores (13 farms in 1965/66 and 17 in 1966/67).

Production of Breeding Lambs

On farms falling within this category North Country Cheviot ewes are crossed with Border Leicester rams to produce Half-bred lambs. In this group more than half of the female lambs are sold at the recognised ewe lamb sales for the breed (three flocks in 1965/66 and five in 1966/67).

In the tables throughout this report the above four categories are separately differentiated. Other breeding and non-breeding ewe enterprises are consolidated under the heading "other flocks".

Other Flocks

Breeding of Ram Lambs

In these flocks more than 40 per cent of lamb receipts is derived from ram lamb sales (two flocks in 1965/66 and 1966/67).

Purchase of ewes in autumn, sale of ewes
with lambs at foot in spring

Two flocks in 1966/67.

Combined hill-lowland flock

In 1966/67 there was one property in the sample with a hill flock providing replacements for its own lowground flock, producing fat lambs.

Non-breeding female flocks were also encountered. One farm bought Half-bred ewe lambs each year and sold them as maiden gimmers the following year. In 1965/66, two farms bought ewes with lambs at foot in spring and sold them all during the summer and autumn. This was repeated on one of the farms in 1966/67. In 1966/67, one farm purchased cast dry ewes for fattening over the winter period.

With reference to lambs sold fat from farms after September 30th, some farms held over the residue of their home reared lambs until it was considered prices obtainable justified selling or until a sufficient degree of finish was obtained (23 flocks in 1966/67); other farms purchased lambs to finish in addition to home reared lambs still on hand (eight in 1966/67), while six farms in the sample in 1966/67 purchased lambs for winter fattening, this being the sole sheep activity on the farms concerned during the year.

For purposes of comparison, these residual and purchased lambs have been grouped into those flocks where lambs were sold mainly off grass before December 31st (13 flocks) those where lambs were sold mainly after December 31st off grass (four flocks) and those where lambs were sold mainly after December 31st with turnip feeding practised (14 flocks).

Some farms mentioned have had secondary sheep enterprises such as ram lamb breeding (one farm), speculative purchase and sale of lambs after short keep (two farms in 1966) and summer fattening of hoggets (one farm in 1967).

A few farms with a crossbred ewe flock maintained a small number of purebred ewes for ram replacements.

Breeds Used

To give an indication of the variation in breeds an analysis of crosses used in these activities is given in Table (iv) of Appendix I and total numbers of ewes and rams by breed are given in Tables (v) and (vi) of that appendix.

The Half-bred was the predominant breed of ewe in the sample, but the Greyface occupied a significant place overall in the sample, 28 per cent of the ewes being of this breed. It was the choice of some farmers on grounds of its greater hardiness than the Half-bred under North East of Scotland conditions, its better mothering qualities, the lower incidence of udder conditions and lower cost of depreciation over the life of the ewe. In most cases where the Blackface ewe was run, it was on farms at higher elevation and with an area of hill land included in the farm. The Suffolk was easily the most predominant breed of ram used for fat lamb production.

It will be noted from Table (iv) in Appendix I that the number of crosses employed exceeds the number of flocks. This is due to the fact that on several farms more than one cross was used, sometimes as a transitional stage of a change in policy.

OUTPUT, VARIABLE COSTS AND GROSS MARGINS
FROM EWE FLOCKS

The components of output and variable costs and the resultant gross margin per ewe in respect of the activities defined previously are set out in Tables 12 and 13 for 1965/66 and 1966/67 respectively. The averages in all columns are calculated on a per flock basis. The "other flocks" in 1965/66 comprised two flocks breeding ram lambs, two where ewes and lambs were bought in spring and sold fat during the summer and one where ewe lambs were bought in autumn and sold as gimmers one year later. The eight flocks in this group in 1966/67 comprised the two ram breeding flocks again, one flock fattening ewes and lambs over summer, one buying ewe lambs for sale as gimmers after a year, two buying in ewes in autumn for sale with lambs at foot in spring, one fattening old ewes over the winter period, and one hill/low ground flock.

Gross margins per ewe for the sample as a whole were better in 1966/67 than in 1965/66. In 1966/67 in only one group, "other flocks", was the gross margin per ewe lower than in 1965/66. One of the main reasons for the lower gross margins as a whole in 1965/66 was the wider difference between the opening and closing valuation of the breeding stock in that year, the lower market prices being paid for breeding stock in 1966 being reflected in the closing valuation. A second major factor contributing to higher gross margins in 1966/67 was the higher level of value of lamb sales per ewe and of closing valuation of lambs per ewe. This was mainly due to a greater number of lambs being produced per ewe in 1967, which may have been a reflection of the open conditions prevailing during the particularly mild 1966/67 winter. This latter factor also resulted in making supplementary feed costs being lower overall in 1966/67. Miscellaneous costs comprise charges for veterinary attention and drugs, casual labour and carriage of sheep to and from markets.

With reference to the individual groups within the sample, and taking the four designated activities - early, late, store and breeding lamb production - in both years the highest gross margin per ewe was achieved by the early fat lamb group despite higher supplementary feed costs. The value of lamb sales together with closing valuation of lambs per ewe was highest in both years for this group, as a result of the higher average prices for earlier sold lambs, and influenced as well in 1966/67 by a higher number of lambs produced per ewe.

With regard to the category "Other Flocks", the flocks in this group achieved a higher average gross margin per ewe mainly by virtue of one ram breeding flock where the combined value of lambs sold per ewe and on hand at the end of the year was over double that of the average flock, and where the margin was assisted further by the very early sale of such lambs as were sold fat. This flock achieved a gross margin of £12 9s. per ewe in 1965/66. The flock buying and selling young Half-bred females achieved a lower than average gross margin per head, partly due to the lower prices being paid for gimmers in 1966, but as a non-breeding enterprise this is not strictly comparable with other flocks in the sample.

In 1966/67, the "Other Flocks" group was enlarged to eight, and its average gross margin per ewe was lowered mainly due to low gross margins being achieved by the two winter breeding and one winter fattening enterprise in the group. The ram breeding enterprise mentioned in the previous paragraph maintained a high gross margin of £12 0s. 6d. per ewe.

Table 12 **Average Output, Variable Costs and Gross Margin per Ewe**
by System of Production. 1965/66

	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Flocks	All Groups
Total Number of Ewes	420	2,216	1,538	227	846	5,247
Number of Flocks	9	21	13	3	5	51
Average Number of Ewes per Flock	47	105	118	76	169	103
OUTPUT	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Subsidies	-: -: -	-: -: -	-: 3: 6	-: -: -	-: -: -	-: 1: -
Sales						
Lambs	7:13: -	1: 8: 6	6: 1: -	7:16: -	6: 8: -	4:11: -
Ewes	3: 6: -	1: 4: -	-:19: -	1:14: -	4:10: -	1:17: -
Rams	-: 2: -	-: 1: -	-: 1: -	-: -: -	3: 5: 6	-: 7: 6
Wool	1: 3: -	1: 7: -	1: 5: -	1: 2: -	2: 1: 6	1: 7: -
Total Subsidies and Sales	12: 4: -	4: -: 6	8: 9: 6	10:12: -	16: 5: -	8: 3: 6
Closing Valuation						
Lambs	1:19: -	6: 5: -	1:17: 6	1:18: 6	4:15: 6	3:19: 6
Breeding Stock	3:10: 6	6:13: -	6: 3: 6	7: -: 6	5: 1: 6	5:17: -
Total Closing Valuation	5: 9: 6	12:18: -	8: 1: -	8:19: -	9:17: -	9:16: 6
TOTAL (A)	17:13: 6	16:18: 6	16:10: 6	19:11: -	26: 2: -	18: -: -
Purchases						
Lambs	-: 4: -	-: -: 6	-: -: -	-: -: -	4: 9: -	-: 9: 6
Ewes	1: 6: -	1: 5: -	1: 3: -	4: 6: 6	2:15: -	1:11: -
Rams	-: 2: -	-: 3: 6	-: 1: -	-: 7: 6	-:11: 6	-: 3: 6
Total Purchases	1:12: -	1: 9: -	1: 4: -	4:14: -	7:15: 6	2: 4: -
Opening Valuation	7: 3: 6	7: 7: -	8: 1: 6	6:10: 6	7:15: 6	7:10: -
TOTAL (B)	8:15: 6	8:16: -	9: 5: 6	11: 4: 6	15:11: -	9:14: -
OUTPUT (A-B)	8:18: -	8: 2: 6	7: 5: -	8: 6: 6	10:11: -	8: 6: -
VARIABLE COSTS						
Purchased Supplements	-:11: 6	-:11: -	-: 9: 6	-:17: -	1:11: -	-:13: -
Homegrown Supplements						
Grain	-:19: -	-:12: 6	-:12: -	-:10: 6	-:11: -	-:13: -
Roughages and Roots	6: 6: -	-: 6: 6	-: 4: 6	-: 6: -	-: 5: 6	-: 6: -
Total Homegrown Supplements	1: 5: -	-:19: -	-:16: 6	-:16: 6	-:16: 6	-:19: -
Grazing	1: 7: 6	1:11: -	-:16: 6	1: 6: -	1: 6: 6	1: 6: -
Total Supplements and Grazing	3: 4: -	3: 1: -	2: 2: 6	2:19: 6	3:14: -	2:18: -
Miscellaneous	-: 8: 6	-: 9: -	-: 9: -	-: 8: 6	1: 3: 6	-:10: -
TOTAL VARIABLE COSTS	3:12: 6	3:10: -	2:11: 6	3: 8: -	4:17: 6	3: 8: -
GROSS MARGIN PER EWE*	5: 5: 6	4:12: 6	4:13: 6	4:18: 6	5:13: 6	4:18: -

NOTE: In Tables 12 and 13 the costs given for roughages and roots refer to the variable costs only.

* See Appendix II for Standard Errors

Table 13

Average Output, Variable Costs and Gross Margin per Ewe
by System of Production. 1966/67

	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Flocks	All Groups
Total Number of Ewes	733	1,490	1,826	442	1,403	5,894
Number of Flocks	14	12	17	5	8	56
Average Number of Ewes per Flock	52	124	107	80	175	105
OUTPUT	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Subsidies	-: -: -	-: 1: 6	-: 3: -	-: -: -	-: 3: -	-: 1: 6
Sales						
Lambs	9: 1: -	2:12: 6	6:10: 6	7: 6: 6	3:12: 6	5:19: 6
Ewes	1:18: 6	-:15: 6	1: 5: -	-:12: -	4: 6: -	1:14: -
Rams	-: 3: 6	-: 2: -	-: 1: -	-: 1: 6	2: 3: -	-: 8: -
Wool	1:10: 6	1: 6: -	1: 5: -	1: 2: -	1: 6: -	1: 6: 6
Total Subsidies and Sales	12:13: 6	4:17: 6	9: 4: 6	9: 2: -	11:10: 6	9: 9: 6
Closing Valuation						
Lambs	2:10: 6	6:15: -	1:17: 6	2: 1: -	2:13: -	3: 4: -
Breeding Stock	6: 3: -	6:17: -	6:17: -	6:17: 6	3:18: 6	6: 5: -
Total Closing Valuation	8:13: 6	13:12: -	8:14: 6	8:18: 6	6:11: 6	9: 9: -
TOTAL (A)	21: 7: -	18: 9: 6	17:19: -	18: -: 6	18: 2: -	18:18: 6
Purchases						
Lambs	-: 3: 6	-: -: -	-: -: -	-: -: -	1:15: 6	4: 6: -
Ewes	2:14: -	1: 2: 6	1: 4: -	1:11: -	1:18: -	1:14: -
Rams	-: 4: 6	-: 3: 6	-: 3: 6	-: 2: 6	-: 4: 6	-: 3: 6
Total Purchases	3: 2: -	1: 6: -	1: 7: 6	1:13: 6	3:18: -	2: 3: 6
Opening Valuation	6: 1: 6	7: 5: -	7: -: 6	6: 6: -	5: 6: 6	6:10: 6
TOTAL (B)	9: 3: 6	8:11: -	8: 8: -	7:19: 6	9: 4: 6	8:14: -
OUTPUT (A - B)	12: 3: 6	9:18: 6	9:11: -	10: 1: -	8:17: 6	10: 4: 6
VARIABLE COSTS						
<u>Purchased supplements</u>	-:14: 6	-:11: -	-:10: -	-:14: 6	1: 3: 6	-:13: 6
<u>Homegrown Supplements</u>						
Grain	-:13: -	-:11: 6	-:11: 6	-:11: 6	-: 5: 6	-:11: -
Roughages and Roots	-: 5: 6	-: 3: 6	-: 4: 6	-: 1: -	-: 3: -	-: 4: 6
Total Homegrown Supplements	-:18: 6	-:15: -	-:16: -	-:12: 6	-: 8: 6	-:15: 6
Grazing	1:14: -	1:13: -	1: 2: -	1:12: 6	1: 4: -	1: 8: 6
Total Supplements and Grazing	3: 7: -	2:19: -	2: 8: -	2:19: 6	2:16: -	2:17: 6
Miscellaneous	-:10: 6	-: 8: 6	-: 9: 6	-:10: 6	-:16: -	-:10: 6
TOTAL VARIABLE COSTS	3:17: 6	3: 7: 6	2:17: 6	3:10: -	3:12: -	3: 8: -
GROSS MARGIN PER EWE*	8: 6: -	6:11: -	6:13: 6	6:11: -	5: 5: 6	6:16: 6

* See Appendix II for Standard Errors

The results in Tables 12 and 13 are expressed on a per ewe basis. Tables 14 and 15 give the gross margins for each group on a forage acre basis, together with details of the number of ewes per forage acre for the whole year and the number of ewes per actual acre in the six winter and six summer months of the year (Winter - October to March inclusive; Summer - April to September inclusive).

Table 14 Average Gross Margin and Carrying Capacity per Acre
by System of Production. 1965/66

	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Flocks	All Groups
Number of Farms	9	21	13	3	5	51
Gross Margin per forage acre *	£ s. d. 13: 8: 6	£ s. d. 10:17: 6	£ s. d. 13:16: 6	£ s. d. 12:15: -	£ s. d. 19:10: 6	£ s. d. 13: - : 6
Ewes per forage acre (whole year)	No. 2.03	No. 2.29	No. 3.01	No. 2.44	No. 3.16	No. 2.52
Ewes per actual acre in winter	1.13	1.78	1.85	1.59	2.26	1.73
Ewes per actual acre in summer	3.10	2.87	3.59	3.05	3.38	3.21

*See Appendix II for Standard Errors

Table 15 Average Gross Margin and Carrying Capacity per Acre
by System of Production. 1966/67

	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Flocks	All Groups
Number of Farms	14	12	17	5	8	56
Gross Margin per forage acre *	£ s. d. 18: 7: 6	£ s. d. 14:11: -	£ s. d. 17:16: 6	£ s. d. 13:19: 6	£ s. d. 16: 9: -	£ s. d. 16:17: 6
Ewes per forage acre (whole year)	No. 2.50	No. 2.21	No. 2.63	No. 1.99	No. 2.98	No. 2.50
Ewes per actual acre in winter	1.20	1.67	1.79	1.43	1.41	1.53
Ewes per actual acre in summer	2.83	2.67	3.13	2.12	3.07	2.96

*See Appendix II for Standard Errors

Overall the results expressed on a gross margin per forage acre basis are at low level. Thirty-four out of 51 flocks had a gross margin of £15 or less per forage acre in 1965/66, while this applied to 25 out of the 56 costed flocks in 1966/67.

A comparison of the gross margins per forage acre for the ewe flocks and the average gross margins per acre for the whole of each farm is given for 1965/66 and 1966/67 in Tables 16 and 17. It should be recognised that the figures within each table are not strictly comparable since the sheep gross margin figures have been calculated for an October 1st - September 30th year, whereas the whole farm averages have been extracted from the financial accounts of the farms in the sample, the financial years of which end at various dates, which rarely coincide with the sheep accounting year used for the survey. Nevertheless the figures do give an indication of the low level of gross margin achieved in the ewe enterprise compared with other enterprises on the farm.

It would be unwise, solely on the basis of the gross margin figures to eliminate the ewe flock from the farm businesses concerned. There is need to appraise the rôle of the flock within the organisation of the farm as a whole, since these small flocks often employ some fixed resources for which there is no alternative use and also make some contribution towards meeting fixed costs.

Table 16 Comparison of Average Gross Margins from Ewe Enterprises with
Average Gross Margins for Farms as a Whole
1965/66

	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Flocks	All Groups
Number of Farms	9	21	13	3	5	51
Gross Margin per forage acre - ewe flock	£ s. d. 13: 8: 6	£ s. d. 10:17: 6	£ s. d. 13:16: 6	£ s. d. 12:15: -	£ s. d. 19:10: 6	£ s. d. 13: -: 6
Average gross margin per acre for whole farm	26:12: -	28:10: -	24:14: -	22:18: -	27:18: -	26:15: 6

Table 17 Comparison of Average Gross Margins from Ewe Enterprises with
Average Gross Margins for Farms as a Whole
1966/67

Number of Farms	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Flocks	All Groups
	14	12	17	5	8	56
Gross Margin per forage acre - ewe flock	L s. d. 18: 7: 6	L s. d. 14:11: -	L s. d. 17:16: 6	L s. d. 13:19: 6	L s. d. 16: 9: -	L s. d. 16:17: 6
Average gross margin per acre for whole farm	29: 8: -	29:16: -	24: 2: -	23:18: -	28: 4: -	27: 5: 6

The distribution of ewe flocks by gross margin per forage acre is given in Tables 18 and 19.

Table 18 Distribution of Ewe Flocks in Sample
by Average Gross Margin per Acre
1965/66

Gross Margin per Acre	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Flocks	All Groups
Up to £5	2	1	1	-	-	4
Over £5 to £10	1	9	3	1	1	15
£10 to £15	3	9	2	-	1	15
£15 to £20	1	1	5	2	-	9
£20 to £25	2	-	2	-	-	4
Over £25	-	1	-	-	3	4
Totals	9	21	13	3	5	51

Table 19 Distribution of Ewe Flocks in Sample
by Average Gross Margin per Acre
1966/67

Gross Margin Per Acre	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Flocks	All Groups
Up to £5	-	-	-	-	-	-
Over £5 to £10	1	3	1	1	1	7
£10 to £15	3	5	5	2	3	18
£15 to £20	7	4	6	2	2	21
£20 to £25	2	-	3	-	1	6
Over £25	1	-	2	-	1	4
Totals	14	12	17	5	8	56

FIXED COSTS AND PROFIT

The main objective of the financial evaluation in this report has been the derivation of gross margins by calculation of output and variable costs associated with the sheep enterprise. The nature of the fixed costs renders their derivation for individual enterprises dependent on several arbitrary assumptions and the figures obtained can be subject to error. However, the fixed costs per forage acre have been calculated based on normal enterprise costings procedures and these are presented together with the gross margin per forage acre to give the profit per forage acre in Tables 20 and 21.

Table 20 Average Gross Margin, Fixed Costs and Profit or Loss
per Forage Acre
1965/66

No. of Farms	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Flocks	All Groups
	9	21	13	3	5	51
Gross Margin per forage acre	£ s. d. 13: 8: 6	£ s. d. 10:17: 6	£ s. d. 13:16: 6	£ s. d. 12:15: -	£ s. d. 19:10: 6	£ s. d. 13: -: 6
Fixed Costs per forage acre	15:12: 6	13:14: -	15:14: 6	12: 9: 6	14: 6: -	14:11: 6
Profit or Loss per forage acre *	(-)2: 4: -	(-) 2:16: 6	(-) 1:18: -	+ -: 5: 6	+ 5: 4: 6	(-)1:11: -

*See Appendix II for Standard Errors

Table 21 Average Gross Margin, Fixed Costs and Profit
per Forage Acre
1966/67

No. of Farms	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Flocks	All Groups
	14	12	17	5	8	56
Gross Margin per forage acre	£ s. d. 18: 7: 6	£ s. d. 14:11: -	£ s. d. 17:16: 6	£ s. d. 13:19: 6	£ s. d. 16: 9: -	£ s. d. 16:18: -
Fixed Costs per forage acre	14:17: -	13:14: 6	15:11: -	11: 3: -	14: -: 6	14: 8: 6
Profit per forage acre	+3:10: 6	+ -:16: 6	+ 2: 5: 6	+ 2:16: 6	+ 2: 8: 6	+ 2: 9: 6

*See Appendix II for Standard Errors

The relative magnitude of the standard errors for Profit and Loss per Forage Acre, as shown in Appendix II, confirms that these averages should be treated with more than the usual degree of caution.

FACTORS AFFECTING RETURNS FROM SHEEP ENTERPRISES

The factors affecting output and variable costs will now be discussed in detail.

Output in the ewe breeding flock is dependent upon:-

- (a) the number of lambs sold per ewe tupped which in turn is dependent upon the lambing percentage and subsequent lamb mortality;
- (b) the value of the lambs sold, which is dependent upon weight for fat lambs and the time of year sold;
- (c) the cost of flock depreciation dependent on the prices paid for ewe and lamb replacements, the length of time they remain on the farm, the price received for culls and the extent of mortality;
- (d) receipts for wool.

The components of variable costs are those of foodstuffs—concentrated foods, both purchased and home grown, roughages, roots and grazing — and the miscellaneous costs of veterinary services and drugs, casual labour and carriage.

LAMBING PERFORMANCE

Lambing Percentages by Activities

For the purpose of this report the lambing percentage is defined as the number of lambs docked as a percentage of the number of ewes tupped.

The average lambing percentage for the various activities for 1966/67 is set out in Table 22.

Table 22 Average Lambing Percentage per Flock by System of Production
1966/67

Group	Number of Flocks	Average Lambing Percentage per Flock
Early Fat Lamb	14	160
Late Fat Lamb	12	147
Store Lamb	16	138
Breeding Lamb	5	160
Other Flocks	4	119
All Flocks	51	147

*See Appendix II for Standard Errors

Two breeding flocks from which ewes were sold in-lamb before lambing are excluded from the above analysis. Before discussion of the results for the various groups, a further Table, Table 23, is presented showing when the main lambing occurred in the flocks of each group.

Table 23 Distribution of Flocks According to Time of Main Lambing
by System of Production
1966/67

Group	Time of Main Lambing			
	December - January	February	March	April
	No. of Flocks	No. of Flocks	No. of Flocks	No. of Flocks
Early Fat Lamb	1	4	7	2
Late Fat Lamb	-	-	4	8
Store Lamb	-	-	7	10
Breeding Lamb	-	-	3	2
Other Flocks	2	1	1	1
All Flocks	3	5	22	23

It can be seen that the highest lambing percentages were achieved in the early fat lamb and in the breeding lamb groups. In the former group a high lambing percentage was achieved despite the fact that on average lambing occurred much earlier than in the other groups. This high average lambing percentage coupled with the higher prices for lambs sold earlier in the season tended to give the early fat lamb group its advantage in terms of gross margin per ewe and per acre in 1966/67. The lowest average lambing percentage of the four designated groups was that of the store lamb group, but some of the flocks in this category occupied the higher altitude farms in the sample, where a poorer lambing performance can be expected. None of the store or late fat lamb flocks had their main lambing occurring before March. The flocks in the early fat lamb group were the smallest overall, averaging only 52 ewes per flock, perhaps allowing for more attention at lambing. The low average achieved in 1966/67 by the 4 flocks in the "other flocks" group is the result of the influence of two flocks which lambed in January, one of which contained 10 per cent of ewe lambs while the other consisted of very cheaply purchased old ewes, with lambing percentages of 100 and 93 respectively.

Influence of Lambing Percentage on Gross Margins

Table 24 shows how gross margin per ewe and per acre tend to increase with lambing percentage. The results of the small first group are biased by one ram breeding flock in it. Ignoring that flock the figures are £4 15s. 6d. and £15 10s. 6d. respectively.

Table 24 Relationship of Gross Margins to Lambing Percentage
1966/67

Lambing Percentage	Number of Flocks	Average Gross Margin per Ewe*	Average Gross Margin per Acre*
Under 101	4	£ s. d.	£ s. d.
101 - 125	10	6:11: -	21: 1: -
126 - 150	11	5:15: 6	13:15: 6
151 - 175	18	6:15: -	14:15: 6
Over 175	8	7:16: -	16:18: 6
		9: 2: -	21: 3: -

* See Appendix II for Correlation Coefficients

Influence of Breeding from Ewe Lambs on Lambing Percentages and Gross Margins

As an alternative to purchasing higher priced gimmers some farmers in the sample purchased ewe lambs for flock replacement and put them to the ram in their first year. The average lambing percentage of nine flocks in the sample which included ewe lambs put to the tup was 116 per cent in 1966/67, compared with 153 per cent average lambing percentage in 42 flocks not breeding from ewe lambs. The lower level of lambing percentage in the former flocks, however, has not been sufficient to significantly offset the slightly higher average gross margins in these flocks.

Table 25 sets out average lambing percentages and gross margins according to whether there were ewe lambs in the flock or not.

Breeding from lambs involves modifications in management in relation to time of tupping. In five of the nine flocks the ewe lambs were put to the ram from a fortnight to four weeks later than the rest of the flock and this resulted in lambing being spread over a longer period.

Table 25 Lambing Percentage and Gross Margins of Flocks Breeding
From Ewe Lambs and of Other Flocks
1966/67

Type of Flock	Number of Flocks	Average Lambing Percentage	Average Gross Margin per Ewe	Average Gross Margin per Acre
		%	£ s. d.	£ s. d.
Flocks with Ewe Lambs	9	116	7: 3: 6	18:17: 6
Flocks without Ewe Lambs	42	153	7: 2: -	16: 9: 6

Influence of Time of Lambing on Lambing Percentages and Gross Margins

Table 23 has already shown the relationship of time of lambing to system of production. Table 26 shows the relationship between time of main lambing and lambing percentages, and also presents average gross margin data for flocks lambing in the respective months.

Table 26 Lambing Percentage and Gross Margins in Relation to Time of Main Lambing
1966/67

	Number of Flocks	Average Lambing Percentage	Average Gross Margin per Ewe	Average Gross Margin per Acre
		%	£ s. d.	£ s. d.
December - January	3	114	7: 9: 6	22: 8: 6
February	5	150	6: 17: -	16: 14: 6
March	21	157	6: 18: -	16: 14: 6
April	22	141	7: 5: -	16: 9: 6

When the figures for the ram breeding flock are taken out of the December - January averages, the average lambing percentage (2 flocks only) is 121, the gross margin per ewe £5 5s. and per acre £14 15s. 6d. The two flocks then left in this group averaged only 29 ewes, and the five in the February lambing group only 42 ewes.

A study of factors determining the choice of farmer's date of lambing formed part of the investigation. The predominant reasons for the choice of March - April lambing were the likelihood of better climatic conditions at that time and the probability that availability of grass would reduce the need for supplementary feeding. Three farmers aimed to lamb in April to coincide with the school holidays. Labour availability was a factor influencing the choice of six farmers, who timed their lambing to end early in March to free themselves for the subsequent demands of spring cultivations and sowing. Most farmers who practised early lambing did so with the express intention of selling their lambs earlier - in some cases to attract higher prices, while in others to free grass for cattle later in the season. One farmer lambed his flock in April expressly to be able to sell his lambs later on the upturn of prices at the calendar year end and after the New Year. Several farmers who had previously followed a policy of early lambing had changed to later lambing on account of high feed costs and mortality experienced with the earlier dates.

Influence of Breed on Lambing Percentages

Table 27 gives the average lambing percentage of flocks according to breed for 1966/67. Flocks where ewe lambs have been tupped are excluded, and also a number of flocks where large numbers of more than one breed are carried. The results are much as expected, with Blackface flocks, either running in the poorer country or consisting of

cast ewes on the better farms, having the lowest average percentage, and the influence of the prolific Border Leicester strain appearing in the Greyface and Half-bred ewe flocks.

Table 27

Lambing Percentages According to Breed of Ewe

1966/67

(Excluding Flocks where Ewe Lambs Topped)

Breed of Ewe	Number of Flocks	Average Lambing Percentage*
Blackface	8	132
North Country Cheviot	9	142
Greyface	5	161
Half-bred	11	173

*See Appendix II for Standard Errors

Flushing

The practice of consciously affording a higher plane of nutrition just prior to tupping was followed on most farms in the sample. Excluding flocks where ewe lambs were put to the tup, the 34 farms where flushing was practised had an average lambing percentage of 160 per cent in 1966/67. On the other hand, the 8 flocks where the farmers stated that no special pre-tupping treatment was given, had an average lambing percentage of 138 per cent.

Flushing was usually effected by grazing ewes on maiden seeds or aftermaths. Of the 34 farms where flushing was carried out, 28 took measures after weaning to bring down the condition of the ewes by running them at high stocking rates on bare pastures or rough ground.

Although the number of the non-flushed flocks above is small, the figures tend to confirm the value of flushing in increasing lambing percentages.

General Breeding Management

The average ewe:ram ratio at tupping for the sample was just over 31. Raddling was practised in twenty flocks, in thirteen cases with the primary object of checking the activity of the rams, in the other seven in order to segregate batches for convenience at lambing. In three cases teaser rams were used prior to tupping in an attempt to concentrate the bulk of lambing over a shorter period. The farmers

concerned reported that this was having the desired effect.

With regard to organisation of labour at the time of lambing, on most farms the farmer himself coped with all the lambing work, assisted in some cases by family labour. In six of the flocks on farms with a farmer-son arrangement, the lambing was carried out entirely by the son. In only two cases was lambing not carried out by the farmer or members of his family, one of these being a large unit employing a full-time shepherd assisted by a student during the lambing period. In over half the flocks the ewes are held during lambing in grass fields adjacent to the steading, sometimes the same field every year. This is accompanied in most cases by the use of buildings for temporary shelter of the flock during particularly inclement weather or, in some cases, for the housing of newly lambed ewes with their lambs for a day or two after lambing. Where lambing did not take place near the steading, some form of shelter was usually provided in the field. The general impression gained was one of careful management at lambing. The average percentage of lambs born dead or dying between birth and docking was 8.5. The average mortality of ewes per flock between tupping and the end of lambing was 2.7 per cent, and a further 7.1 per cent was barren (no lambs produced at all). These included flocks where ewe lambs were tupped. In flocks where ewe lambs were not tupped, the average number of barren ewes was 4.3 per cent.

A comparison of certain efficiency factors operating on the 10 flocks with the best lambing percentage in 1967 and the worst 11 (excluding in both cases flocks where ewe lambs are tupped) is shown in Table 28.

Table 28 Performance of 10 Best and 11 Worst Flocks Judged on Lambing Percentage
1966/67

	Average of 10 Best Flocks	Average of 11 Worst Flocks
Lambing Percentage (Per cent)	184	119
Average Size of Ewe Flock (No. of ewes)	35	88
No. of Flocks practising Flushing	9	7
Proportion of barren ewes (Per cent)	4.1	6.8
Proportion of ewes dying between tupping and end of lambing (Per cent)	2.2	4.0
Lamb losses before docking as a proportion of lambs born (Per cent)	5.5	13.2

It can be seen from this table that the best results were achieved on farms with a comparatively small number of ewes, and that the three efficiency factors of proportion of barren ewes in the flock, ewe mortality and lamb losses were of major importance. Five flocks in the 'worst' group were located on farms in exposed or higher altitude situations, and a further one comprised a flying winter flock of old cast hill ewes. One of the 'worst' group had an unusually high number of lamb losses through drowning in new open drains. The Half-bred ewe flock predominated on the farms in the 'best' group, while only one of the 'worst' flocks was completely comprised of Half-bred ewes.

VALUE OF LAMBS

Time of Sale and Type of Lamb Sold

Disposal of lambs from time of docking for each of the designated groups for 1966/67 is set out in percentage terms in Table 29. This table covers all disposals including those beyond the close of the accounting period at 30th September, 1967.

Table 29 Disposal of Lambs from Breeding Flocks by System of Production
1966/67

	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	All Groups
	%	%	%	%	%
Lambs sold fat up to 30th September, 1967	67.1	22.7	9.5	7.1	23.9
Lambs sold fat 1st October to 31st December, 1967	21.1	33.0	2.2	7.8	16.4
Lambs on hand at 31st December, 1967 (not including lambs purchased)	6.6	37.5	5.5	16.1	17.5
Lambs sold store	3.9	2.2	79.2	67.4	39.0
Other disposals	0.2	1.2	2.1	-	1.2
Lambs retained for breeding	0.2	0.7	0.9	-	0.6
Lambs dying since docking	0.9	2.7	0.6	1.6	1.4
Totals	100.0	100.0	100.0	100.0	100.0

For the sample as a whole only just under 24 per cent of the lambs are sold fat before 30th September while a further 16 per cent were sold fat during the following three months. In the early fat lamb group over 67 per cent of the lambs are sold fat before 30th September which, with the higher prices received for earlier sold lambs, contributes to their superiority in terms of gross margins. In the late fat lamb group under 23 per cent of lambs were sold fat before 30th September, and over 37 per cent were still on hand at 31st December. This figure is biased by the presence of two farms in this group which averaged 450 home-bred lambs still on hand at the end of the calendar year.

In the whole sample 39 per cent of the lambs were sold as stores (including a small proportion of breeding lambs). As might be expected

in the store and breeding lamb groups only 9.5 per cent and 7.1 per cent respectively were sold fat before September 30th. For the sample as a whole the intensity of production is low, a conclusion supported by the low level of the gross margins.

Selling Prices for Lambs

Table 30 on the following page, shows the average prices received per lamb in the months prior to 30th September, 1967, together with the average value of those remaining at that date. This illustrates the drop in prices as the season progresses and the relative price advantage achieved by the early fat lamb group.

The average price realised for all fat lambs sold in this period was only 18s. per head above that realised for store lambs. The number of Half-bred ewe lambs sold for the breeding trade was relatively small and the price received barely surpassed the average price for fat lambs.

Other disposals referred to are casualties or lambs sold shortly after birth.

Table 31 gives the average realisation per head for all fat lambs and hoggets sold from flocks in the sample between October, 1965 and September, 1967 and includes lambs and hoggets fattened in the autumn and winter of 1965/66 not specifically studied elsewhere in this report.

Table 30

Average Monthly Prices Per Lamb by System of Production
1966/67

	Early Fat Lamb		Late Fat Lamb		Store Lamb		Breeding Lamb		All Groups	
	No. of Lambs	Average Price	No. of Lambs	Average Price	No. of Lambs	Average Price	No. of Lambs	Average Price	No. of Lambs	Average Price
		£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.
<u>Fat Lambs</u>										
May - June	68	8:13: 6	12	7: -: -	4	9:12: -	-	-: -: -	84	8: 9: 6
July	250	7:12: -	91	7:18: -	97	7: 3: -	11	8: -: -	449	7:11: 6
August	212	6:18: -	183	6:18: 6	40	6:15: -	9	7:10: 6	444	6:18: 6
September	251	7: 1: 6	222	7: 1: -	100	6: 1: 6	30	7: 2: -	603	6:18: -
All Fat Lambs	781	7: 6: 6	508	7: 3: -	241	6:13: 6	50	7: 7: 6	1,580	7: 3: 6
Store Lambs	45	6:12: 6	50	6: 6: -	1,602	6: 5: -	149	6: 6: -	1,846	6: 5: 6
Breeding Lambs	-	-	-	-	66	6: 6: -	279	7: 4: 6	345	7: 1: -
Other Disposals	2	1:17: 6	27	1: 1: -	54	1: 7: -	-	-	83	1: 5: 6
On hand 30th Sept.	331	6:11: 6	1,611	6: 4: -	573	5:19: 6	216	6: 4: -	2,731	6: 3: 6
All Lambs	1,159	7: 1: 6	2,196	6: 7: -	2,536	6: 2: 6	694	6:14: -	6,585	6: 8: 6

Table 31

Average Sale Price of Fat Lambs and Fat Hoggets
(including purchased lambs), by month
1965/66 and 1966/67

Month	1965/66		1966/67	
	No. of Lambs and Hoggets	Average Sale Price (including guarantee)	No. of lambs and Hoggets	Average Sale Price (including guarantee)
		£ s. d.		£ s. d.
October	256	7: 5: 6	787	6:17: 6
November	488	7: 6: 6	650	6:17: 6
December	606	7: 8: -	537	7: 5: -
January	542	7:14: 6	464	7:11: -
February	357	7:19: -	580	7:12: 6
March	512	8: 9: 6	432	8: -: -
April	377	8:15: -	292	8:14: -
May	266	8:12: 6	365	8: 7: 6
June	154	8: 7: 6	210	8: 7: -
July	222	7:14: 6	567	7:10: -
August	304	7: 4: -	554	6:15: -
September	422	6: 7: -	757	6:18: 6
Totals	4,506	7:14: -	6,195	7: 7: -

It can be seen that overall, and in almost every month, the flocks have failed to achieve the same level of prices per lamb in 1966/67, as were received in 1965/66. The seasonal trend in prices, with the rapid fall off after July and the gradual build-up from December, is discernible, more particularly in 1966/67.

In an attempt to assess whether any particular breed has an advantage in price realisation, Table 32 breaks down these figures into breed groups with consolidation of the months into the summer, pre New-Year and post New Year periods. Prices for store lambs are also included. Not all lambs in the sample appear in this table since in several flocks more than one breed was run and it was not possible to differentiate the breeds within each batch sold.

Table 32

Average Selling Price of Fat Lambs, Fat Hoggets and Store Lambs by Breed
1965/66 and 1966/67

	Suffolk x Half-Bred		Greyface		Suffolk x Greyface		Suffolk x Shetland		Oxford x Suffolk		Half-Bred		Suffolk x N.C. Cheviot	
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
		£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.
Fat Lambs Sold 1/10/65 - 31/12/65	200	7:10: -	1	7: 6: -	86	7: 4: 6	-	-: -: -	-	-: -: -	20	8: 7: 6	210	7: 7: 6
Fat Hoggets Sold 1/1/66 - 30/6/66	408	8: 4: 6	124	7:11: 6	152	7:10: 6	112	7:12: -	-	-: -: -	22	8: 2: -	41	6: 4: -
Fat Lambs Sold 1/6/66 - 30/9/66	307	7: 7: -	61	6:17: 6	155	7: 4: 6	-	-: -: -	26	8: 5: 6	23	6:13: 6	154	6: -: 6
Fat Lambs Sold 1/10/66 - 31/12/66	513	7:10: 6	75	6:15: 6	244	6:19: -	-	-: -: -	-	-: -: -	20	6:17: -	-	-: -: -
Fat Hoggets Sold 1/1/67 - 30/6/67	481	7:15: 6	312	8: 3: -	178	8: -: -	-	-: -: -	2	7: 9: 6	110	10: 8: -	-	-: -: -
Fat Lambs Sold 1/6/67 - 30/9/67	657	7: 6: 6	161	6:17: -	314	7: 5: -	-	-: -: -	-	-: -: -	193	6:10: -	36	8: 3: 6
Store Lambs Sold 1966	739	6: 4: -	491	5:13: -	254	5: 7: -	-	-: -: -	-	-: -: -	444	5:18: -	-	-: -: -
Store Lambs Sold 1967	698	6:10: -	448	5:12: -	465	6: 9: -	-	-: -: -	-	-: -: -	136	6: '3: 6	-	-: -: -

Overall, there appears to be a tendency for the Suffolk x Half-bred lambs in this sample to command a slight premium over lambs of the other breeds. There is little discernible difference between the Greyface and the Suffolk x Greyface lambs, except that in both summer seasons the influence of the Suffolk tup appears to be expressed in higher average prices per head. The high average price received by Half-bred fat hoggets sold in 1967 is due to the effect of one farm carrying over a batch from this breed for late sale at high weights.

Weights at Time of Sale

A study of lamb prices is incomplete without some reference to the weights at time of sale. It was not possible to obtain a complete return of weights achieved at sale, but figures for the majority of lambs disposed of were obtained.

The average weights per month converted to a cold dressed equivalent on a weighted basis are shown in Table 33. In both groups where fat lamb production was the main avenue of production, average deadweight equivalents were 50 lb. and, in general, this is the selling weight aimed at by a large proportion of the co-operating farmers in the study. The sale of lightweight fat lambs is not common in this area, and this type of lamb is not generally sought after by butchers in the North-East.

Table 33

Average Equivalent Deadweights by Month of Sale of Fat Lambs by System of Production 1966/67

Month of Sale	Early Fat Lamb		Late Fat Lamb		Store Lamb		Breeding Lamb	
	No. of Lambs	Average d.w.	No. of Lambs	Average d.w.	No. of Lambs	Average d.w.	No. of Lambs	Average d.w.
		lb.		lb.		lb.		lb.
May - June	68	48	12	48	4	52	-	-
July	250	49	91	50	80	45	11	54
August	212	50	91	49	40	49	9	54
September	251	52	218	51	100	47	30	54
All	781	50	412	50	224	47	50	54

As far as they are available, lamb weights for the various breeds have been computed for the whole of the 1966/67 year, and are shown in Table 34. These weights, on average, show very little variation from the 50 lb. mark, the higher weights in general being obtained for hoggets held over for fattening and sale in the winter months. The small number of Half-bred lambs fattened showed superior weights both in Table 34 and in the breeding lamb group in Table 33. The general conclusion to be drawn from the limited amount of weight data available is that in the conditions obtaining on these lowland mixed farms, average weights at which fat lambs and hoggets are sold is fairly constant between breeds.

Table 34 Average Equivalent Deadweights by Month of Sale by Breed
1966/67

Month	Suffolk x Half-bred		Greyface		Suffolk x Greyface		Half-bred		Suffolk x N.C. Cheviot	
	No. of lambs	Average d.w.	No. of lambs	Average d.w.	No. of lambs	Average d.w.	No. of lambs	Average d.w.	No. of lambs	Average d.w.
<u>1966</u>										
October	164	49	36	49	136	50	-	-	-	-
November	156	51	-	-	24	50	20	55	-	-
December	193	53	14	57	84	53	-	-	-	-
<u>1967</u>										
January	262	51	11	47	82	53	20	55	-	-
February	143	51	12	55	87	53	-	-	-	-
March	46	53	57	51	24	50	-	-	-	-
April	66	55	53	54	5	52	40	60	-	-
May	12	50	130	51	-	-	50	63	-	-
June	54	51	22	51	6	37	-	-	7	47
July	152	46	27	41	114	51	11	54	29	49
August	117	52	30	46	142	50	17	51	-	-
September	254	90	12	50	52	55	-	-	-	-
Totals	1,619	51	404	50	756	50	158	58	36	49

Factors Affecting Time and Type of Sale

The main factor affecting the decision of most farmers when to sell their lambs fat during summer is the attainment of a weight equivalent to 50 lb. on slaughter. Some set a higher target of 53 - 55 lb. Several of those unable to attain the 50 lb. target by the end of August then hold their lambs over to the period of higher prices in late

November - December. Most farmers not buying in additional lambs have all their lambs away by then without resort to supplementary feeding.

Of the seventeen farms where the major sheep product in 1966/67 was the sale of store lambs only six were in areas where the combination of altitude and natural conditions made store lamb production traditional practice. For most of the other flocks the decision to sell lambs as store was based on freeing the grass acreage for cattle in the latter half of summer.

Market v. Slaughterhouse Sales

Of 49 farmers questioned as to where they sold their fat lambs and hoggets, 22 sold exclusively through the auction ring at markets, 14 sold exclusively at slaughterhouses and 13 sold partly to slaughterhouses and partly through the auction ring. For these latter 13, eleven sold through the channel they considered would offer the better return at the time of sale and two could offer no reason for varying their selling practice. Taking the 22 farmers selling their lambs at markets eight considered that on average, realisations were better there, seven sold through the auction ring on account of its proximity to the farm, three because it was possible to withdraw lambs from sale if the price bid was considered unsatisfactory, one on account of tradition and three could give no reason for their preference. Out of the 14 selling direct to slaughterhouses on a weight and grade basis, ten did so because they considered that, overall, prices received were better than at markets, two because they could know beforehand the price per lb. they would receive, one because he considered weighing at the slaughterhouse was more accurate and one could give no reason.

VALUE OF WOOL AND ASPECTS OF WOOL PRODUCTION

In ewe flocks covered in this study the value of wool does not form an important proportion of total output from sheep and wool, varying from 11.6 per cent in eight North Country Cheviot flocks in 1966/67 to 17.1 per cent in the one Border Leicester flock in 1966/67. The figures for each breed are given in Table 35.

It was not possible to ascertain the weight of wool sold in all flocks, but for those where it was obtainable, wool weights clipped per ewe varied between 5.4 lb. for North Country Cheviot flocks to 10.1 lb. for the Border Leicester flock. Half-bred flocks clipped 8.3 lb. per ewe on average and Greyface 8.1 lb. The average realisation price per lb. for these breeds varied from 45. 2d. per lb. for the Greyface flocks to 52. 7d. per lb. for the Cheviot. Half-breds averaged 49. 5d. per lb. There was evidence of loss of wool from the North Country Cheviots before clipping.

Table 35 Output of Wool as a Percentage of Total Output
From Sheep and Wool
1966/67

Breed	No. of flocks	Output of Wool as a Percentage of Total Output from Sheep and Wool
		%
Blackface	8	12.3
N.C. Cheviot	8	11.6
Greyface	7	13.8
Half-bred	15	14.4
Mixed	15	13.6
Border Leicester	1	17.1

Table 36 Average Wool Weights and Prices Per Lb. By Breed, 1966/67

Breed	No. of Ewes	Average Weight of Wool per ewe	Average Price received per lb.
		lb.	d.
Blackface	162	6.3	49.0
N.C. Cheviot	319	5.4	52.7
Greyface	802	8.1	45.2
Half-bred	1,481	8.3	49.5
Mixed	1,224	5.9	50.8
Border Leicester	50	10.1	45.7

An enquiry into methods of wool production revealed that clipping was performed by contract or by use of casual labour on 20 flocks, by farm or family labour (sometimes assisted by neighbours) on 31 flocks, and by a combination of farm and contract labour in one flock.

Machines were employed for shearing on 27 farms, and hand-shearing undertaken on 24 with a combination of hand and machine shearing on one farm.

Clipping is carried out indoors in courts on 15 of the farms, and outside on 37 farms, sometimes in sheep pens, sometimes on grass on a sheet and sometimes on grass without a sheet.

If the conditions of wool production in the sample are similar to those on most farms constituting the national flock, there must exist some scope for improvement. Although on a per farm basis, wool makes a comparatively minor contribution to total output, in national terms the 81.9 million lb. sold to the Wool Marketing Board in the year ended 30th March, 1967, represented a payment of £16.1 millions to producers, and the Annual Report of the Board for that year comments on the overall disappointing standard of the clip.

Figures quoted for shearing rates are bound to be based mainly on guesswork but the average of the speeds quoted for machine shearing by contract was 12.0 sheep per hour, for machine shearing by farm staff 7.1 sheep per hour, for hand shearing by contract 6.8 sheep per hour and for hand shearing by farm staff 5.9 sheep per hour.

GRAZING AND FORAGE UTILISATION

Stocking rates per grazing acre and per forage acre have already been set out in Table 14 for 1965/66 and Table 15 for 1966/67.

More important than comparisons between the groups are the low overall rates of stocking per grazing acre and per forage acre over the year, although these do not appear to be any worse than average figures quoted for gross margins elsewhere. The overall stocking rate per forage acre for all flocks was 2.52 ewes per forage acre in 1965/66 and 2.50 in 1966/67. It should be noted that average figures for the store lamb group in both years were among the highest of all groups and this has tended to give this group a relatively more favourable position on a gross margin per acre basis. Rough grazing used by some of the store lamb flocks had to be corrected to an acreage

equivalent basis and this conversion could give rise to some margin of error. The relationship between stocking rate and gross margin is examined in Table 37. No clear relationship between stocking rate and gross margin per ewe can be discerned. Although there are relatively few flocks falling in the higher stocking rate groups there appears to be a tendency for gross margin per forage acre to increase as the stocking rate increases.

Table 37 Relationship of Stocking Rates and Gross Margins
1966/67

Ewes per Forage acre	No. of flocks	Gross Margin per ewe	Gross Margin per acre*
		£ s. d.	£ s. d.
0.01 - 1.00	0	- - -	- - -
1.01 - 1.50	3	6 19 6	10 15 6
1.51 - 2.00	14	7 3 6	13 8 6
2.01 - 2.50	17	6 13 -	15 3 6
2.51 - 3.00	14	7 3 6	20 1 6
3.01 - 3.50	3	7 8 6	23 16 0
3.51 - 4.00	3	4 0 0	17 17 6
4.01 - 4.50	2	6 17 0	32 8 6

* See Appendix II for correlation co-efficient

The major part of the forage acreage is provided by grazing, including aftermath. Rates of fertiliser application in terms of units of nitrogen applied per acre are low. For 1967 in the early fat lamb group the average rate of application of nitrogen per acre on ordinary grazing, excluding rough grazing was 26 units, in the late fat lamb groups it was 36 units, in the store lamb group 24 units, in the breeding lamb group 18 units and in the other ewe flocks 52 units. For all flocks the average rate of application was 31 units. Most of the fertiliser applied was in the form of compound mixtures. Fertiliser application on hay and silage fields, which were utilised for grazing by sheep both before and after cutting, was somewhat higher averaging 71 units of nitrogen per acre in 1967 on fields being cut for silage and 47 units on fields cut for hay.

In considering grazing management of the ewe flock, four main aspects require to be studied - the relationship of sheep to cattle in the grazing complex; grazing management of ewes over the winter between tupping and lambing; grazing from lambing to weaning; and grazing management of lambs after weaning.

Grazing management of ewes between weaning and tupping, and at lambing has already been dealt with in the previous section.

A large number of cattle activities was encountered on the farms being studied. These varied from activities differentiated due to breed of cattle, age of purchase, age of sale or type of end product, and very often more than one activity was found on the same farm. In many cases sheep were regarded as complementary grazers with cattle, either grazing with them or following after them in a grazing rotation to deal with bottom growth. In a few cases sheep were favoured in allocation of the best grazing during summer, but in general their presence was regarded by farmers as being detrimental to the performance of cattle, particularly fattening cattle. Accordingly, in these cases, grazing management over the summer months was organised to give cattle preference with sheep following in their scavenging rôle.

Where competition from sheep for available grazing was thought to occur, it was considered to be at its greatest in the early spring and to a lesser extent over the summer months. Cattle are commonly housed for the winter in this area at the beginning of November, with beasts generally being turned out for full time grazing again around April, although because of seasonal factors no firm times can be stated.

Grazing management over the winter on some farms could possibly prejudice early grass growth in the spring. This can be attributed to the fact that during the period of inwintering cattle, sheep had access to the whole of the grass on these farms. The various systems of winter grazing management are summarised in Table 38.

Table 38

Systems of Winter Grazing Management

System of Management	Number of Farms
Rotated round all grass fields at regular intervals	27
Rotated round all grass fields till time of supplementary feeding then confined to one grass field	5
Set stocked over all grass fields	6
Set stocked over all grass fields, free access to each	3
Rotated round part of grass acreage	2
Set stocked on part of grass acreage	7
Folded on turnips	3
On rough hill grazing, lower land run-off	4

The effect of most of these systems of grazing management is a low winter stocking figure, averaging 1.53 ewes per grazing acre in the 1966/67 winter.

A recommended practice for lamb production is the provision of pasture which has not been grazed by lambs in the previous season. The adoption of this practice is recommended in order to reduce infestation with nematodirus parasites. In effect this usually means the grazing of first year grass, unless fields can be used for grazing by cattle only in the previous year. The widespread traditional practice in this area, however, is the taking of a crop of hay or silage off first year grass. This results in this grass being unavailable to lambs at the very time when a parasitic build up takes place on the fields where lambs have been grazed the previous year and which have again to be utilised by them together with their dams.

On only four farms where ewes and lambs were held over the whole of the summer was it possible to utilise fields not grazed with lambs in the previous year, and two of these farms practised forward creep grazing. Table 39 summarises systems of summer grazing management.

Table 39

Systems of Summer Grazing Management

Systems of Management	Number of Farms
Clean field, followed by rotation round all grass fields	13
Clean field, followed by set stocking	4
Clean field, followed by alternate grazing of 2 fields.	1
Alternate grazing of 2 fields	4
Rotation round all grass fields	6
Set stocking	15
Rough hill grazing with access to improved pasture	2
Rough hill grazing only	4
Clean fields whole of summer (including 2 creep grazing)	4

Grazing relationships with cattle over this period varied from following the herd on the rotational systems, to either mixed or separate grazing on the set stocked systems.

Time of weaning of lambs varied. In a few cases it did not occur before the lambs were sold, either as store or fat lambs. When weaning was effected (in 48 flocks) the lambs averaged 18 weeks of age. In the majority of flocks weaning took place early in August. When lambs were weaned the almost universal practice was for them to be put on aftermath of hay or silage, usually on a set stocking basis, or where more than one field was available, occasionally on a rotationally grazed basis. In some cases the lambs left were later rejoined by the ewes for flushing.

To summarise grazing practices, the secondary rôle of sheep in the grazing complex and low rates of fertiliser application impose a pattern of low intensity utilisation of grassland over most flocks in the sample.

MORTALITY OF EWES AND LAMBS AND ANIMAL HEALTH

During the course of the survey, the co-operating farmers were asked to give details of the number of deaths that had occurred and, where possible, the cause. Understandably it was difficult for farmers to give precise answers to this latter question and, in just over 63 per cent of instances no cause of death could be specified. When reconciliation of ewe numbers was made some discrepancies in numbers were also revealed and these are regarded as losses unaccounted for. The average percentage losses of ewes per flock between tupping and lambing in 1966/67 have been discussed in the section dealing with lambing.

Where cause of death was able to be specified by farmers the main condition was metabolic disorders, accounting for nine per cent of total deaths. Difficult lambings caused 5.4 per cent of deaths, while other causes given were pneumonia, on back, suspected losses caused by feeds consumed, suspected worm infestation, pregnancy toxaemia and killings by dogs.

The total of ewe deaths comprised 4.7 per cent of the total ewes at the beginning of the year. There were no major outbreaks of disease, except in two flocks, in one of which there was an outbreak of orf and in the other an incidence of liver fluke infestation.

Lamb deaths in 1966/67 up to September, 30th 1967 are detailed in Table 40.

Table 40

Losses of Lambs, 1966/67

Cause of Death	Number of Lambs	Per Cent of Total Deaths
Born dead or died shortly after birth	428	84.7
<u>Deaths after docking</u>		
Exposure	6	1.2
Misothering	5	1.0
Suspected worm infestation	4	0.8
Suspected pulpy kidney	3	0.6
Drowned	2	0.4
Suspected losses caused by feeds consumed	2	0.4
Suspected pneumonia	1	0.2
Suspected septicaemia following castration	1	0.2
Undiagnosed	53	10.5
Totals	505	100.0

The average percentages of lamb deaths on a flock basis have already been given in the section dealing with lambing. The overall figure of lambs lost as a percentage of those born was 7.2 per cent, and the figure of lambs lost after tailing as a percentage of those tailed was 1.2 per cent.

Even for the small sheep units in this sample occasional use was made of the services of veterinary surgeons, mainly in connection with difficult lambing cases. Over all the flocks carrying ewes, a total of 129 visits by veterinary surgeons was recorded during 1966/67. Next to lambing troubles which accounted for 78 of the visits, the next most common condition encountered was metabolic disorder. On seven farms a veterinary surgeon was called in to perform vaccinations or to undertake docking or to do both. The remainder of the visits reported were for miscellaneous disorders including joint ill, orf, a liver fluke outbreak, inspection for compensation, footrot, suspected pneumonia, udder disorders and in one case for drenching.

In 1966/67 twelve of the farmers did not drench any sheep in their flocks against worm infestation and a further four drenched only those sheep suspected of being infected. No abnormal level of losses of lambs was recorded in any of these flocks. In nine flocks ewes were drenched, usually before tupping, and lambs once or twice during the summer; in fourteen flocks lambs were drenched once during the summer, in ten flocks twice and in six flocks more than twice. With the exception of two farms, the newer preparations on the market were employed for drenching.

With regard to dipping, only two farmers who ran sheep over the summer did not dip or spray their flock in summer. Eighteen of the flocks dipped twice during the year.

FLOCK REPLACEMENT AND CULLING AND FLOCK DEPRECIATION

The layout of Tables 12 and 13 setting out the gross margin data for the various activities does not set out figures for flock depreciation. This can be defined as the difference between the opening valuation of ewes and rams plus the value of purchases less the value of sales of ewes and rams and closing valuation. For the designated groups this is summarised in Table 41.

Table 41 Average Flock Depreciation Per Ewe, 1965/66 and 1966/67

	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	All Groups
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1965/66	1:13: -	-:17: 6	2: 2: -	2:10: -	1:13: 6
1966/67	-:15: -	-:16: 6	-: 4: 6	-: 8: 6	-:11: -

The differences in flock depreciation between the activities are of no significance because of the wide variation in method of replacement within the groups. More significant is the difference between the two years, flock depreciation being much less in the 1966/67 year. This is largely due to the fact that in 1965/66 there was a larger difference between the opening and closing valuations, which were based on market prices, the closing valuation reflecting the drop in market price occurring at the end of 1966, and similarly the recovery is reflected in the closing valuation for 1967. Calculation of valuations involves a considerable amount of arbitrary assumption and any study of the depreciation element must be looked at bearing this point in mind. During the course of the survey farmers who bought replacements were asked to state the type of replacement ewe normally bought, and at what age ewes were normally culled from the flock. The normal policies followed are summarised in Table 42.

Table 42

Methods of Replacement and Culling

Method of Replacement and Culling		Number of Flocks
Bought	Sold	
Ewe Lambs	Gimmers	3
Ewe Lambs	Whole Mouth Ewes	4
Ewe Lambs	Broken Mouth Ewes	9
Gimmers	Whole Mouth Ewes	3
Gimmers	Broken Mouth Ewes	21
Whole Mouth Ewes	Broken Mouth Ewes	3
Old Ewes	Broken Mouth Ewes	6
Mixed Ages	Broken Mouth Ewes	4
Total		53

Some of the flocks reared a small number of their own replacements.

Although these were the normal policies stated to be followed, in fact policy is flexible and the rate of replacement and selling is not constant from year to year, varying with circumstances, particularly market prices. This results in a wide variation in age composition between flocks and does not permit meaningful comparisons of ewe depreciation for the various policies followed.

As an example of this flexibility the three farmers normally purchasing ewe lambs and selling gimmers held over their gimmers in 1966 due to the unfavourable prices pertaining in that year. Thus for farms falling in this group which might be expected to average a turnover of almost 100 per cent, in fact had an average turnover of only 15 per cent in 1965/66 and 30 per cent in 1966/67.

The rate of turnover or wastage of ewes is calculated by taking the sum of the numbers of ewes sold and dying as a percentage of the ewes at the beginning of the year. For the various ages of purchase this turnover is shown for 1965/66 and 1966/67 in Table 43.

Table 43

Rate of Turnover of Ewes by Normal Type of Purchase,
1965/66 and 1966/67

Type of Purchase	Rate of Turnover	
	1965/66	1966/67
Ewe Lambs	25.0	24.7
Gimmers	29.0	27.0
Whole Mouth Ewes	56.9	35.8
Broken Mouth Ewes	54.4	58.1
Mixed Ages	45.0	45.9

The data contained in Table 43 suggest that, on average, ewe lambs and gimmers remain in the flock for a period of four years and whole mouth and broken mouth ewes for two years, although in 1966/67 the rate of turnover for the small number of flocks purchasing whole mouth ewes was lower.

This corresponds roughly with estimates given by farmers as to the number of years ewes were retained in the flock. The figure of rate of turnover for ewe lambs shown in Table 43 is based on flocks selling at various ages. It is interesting to note that in the group where replacement ewe lambs are stated to be carried through to the broken mouth stage the turnover rates for 1965/66 and 1966/67 were 33 and 28 per cent respectively. This suggests that the life of ewe lambs in the flock was shorter in these flocks than would be generally expected. The number of years and sheep involved are far too small to make any categoric conclusion on this point.

The basis of culling in 33 flocks was the state of the ewe's mouth, combined in some cases with mothering qualities. In three farms the prime basis of culling was stated to be mothering ability and in the remainder of the flocks culling was based on age as part of a predetermined policy. The above does not apply to barren ewes which are sold fat in the May-June period. In few flocks were gimmers or older ewes retained in the flock having once failed to produce a lamb.

A summary of actual prices paid for replacement ewes is given in Table 44. This is on a weighted basis and refers only to ewes bought in the late summer-autumn period of the year.

Table 44

Average Purchase Prices of Ewe Replacements by Breed, 1966 and 1967
(per ewe)

Type of Replacement	Half-bred				Greyface				North Country Cheviot				Blackface			
	1966		1967		1966		1967		1966		1967		1966		1967	
	No.	Price	No.	Price	No.	Price	No.	Price	No.	Price	No.	Price	No.	Price	No.	Price
		£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.
Ewe Lambs	92	6: 2: 6	202	6:12: -	207	6:15: 6	154	6: 8: 6	-	-: -: -	-	-: -: -	62	4: 7: -	101	4:10: 6
Gimmers	195	8:17: -	85	10:13: -	82	7:16: -	24	7:15: -	149	5: -: -	67	8: -: 6	37	7:15: -	142	8:11: -
Young or Whole Mouth	-	-: -: -	-	-: -: -	-	-: -: -	-	-: -: -	25	6:19: -	-	-: -: -	-	-: -: -	-	-: -: -
Ewes	-	-: -: -	-	-: -: -	-	-: -: -	55	4: 8: -	107	4: -: -	33	5:16: -	83	3:13: -	120	3: 7: 6
Old Ewes																

The numbers are too small to be of great significance, but in general it will be seen that prices of replacements were higher in 1967 than in 1966. There is little difference in this sample of prices paid for ewe lambs between the Half-bred and Greyface, but Blackface ewe lambs as might be expected are £2 per head lower. Half-bred gimmers in the sample are £1 to nearly £3 dearer than Greyface.

The selling price of old cast ewes sold in the late summer and autumn of 1966 and 1967 is given in Table 45. This does not include the sale of barren ewes sold earlier in the year, and is calculated on a weighted basis.

Table 45 **Average Selling Prices of Cull Ewes by Breed, 1966 and 1967**
(Per ewe)

Breed	1966		1967	
	Number	Average Price	Number	Average Price
		£ s. d.		£ s. d.
Half-bred	101	4: 9: 0	91	4: 2: 0
Greyface	141	4:18: 6	78	5:13: 0
North Country Cheviot	163	3:14: 6	165	4: 4: 0
Blackface	117	3: 7: 0	145	3: 3: 0
Mixed Breeds	83	4: 8: 6	228	4: 2: 0

With the exception of the Blackfaces which were below and the Greyfaces which were above, prices for cast ewes mainly averaged between £4 and £4 10s. The relatively high price for Greyface cast ewes in 1967 was almost entirely due to the influence of one flock.

The average depreciation per ewe for each flock in respect of rams was calculated to be 4 shillings in both 1965/66 and 1967/68 taken to the nearest 6d. Most farmers stated that rams were retained in their flocks for 3 to 4 years and the average percentage turnover calculated for the flocks confirm this. The average turnover per flock averaged 24.7 per cent in 1965/66 and 32.5 per cent in 1966/67.

An indication of the level of prices paid for rams is given in Table 46. The prices refer to purchases made in the autumns of 1966 and 1967.

Table 46

Overall Purchase Prices of Ram Replacements, 1966 and 1967

(Per Ram)

Breed	1966		1967	
	Number	Average Price	Number	Average Price
		£ s. d.		£ s. d.
Suffolk	21	19: 1: -	25	25:16: -
Border Leicester	6	14:11: 6	21	16:19: 6

SUPPLEMENTARY FEEDING IN EWE FLOCKS

The variable costs for each activity for 1965/66 and 1966/67 were set out in Tables 12 and 13. There a distinction was made between purchased and home-grown foods. Excluding grazing, 40.6 per cent of the variable costs of foods was in the form of purchased inputs in 1965/66 and 46.6 per cent in 1966/67. Purchased foods consisted mainly of proprietary concentrates, sugar beet pulp and draff. Only small amounts of grain or other foodstuffs were bought. In 1966/67 only five farmers did not use purchased food. The largest input of purchased food per ewe occurred in the "other flocks" group where it was substantially affected by the presence of two small ram breeding flocks within the group.

The average quantities of hand fed food including roots, fed per ewe in 1966/67 are set out in Table 47 for each activity. The foods are broken down into concentrates, including sugar beet pulp, barley, oats, draff, hay, silage and roots. The quantities relate to all food fed to the ewe flock throughout the year, but most of the foodstuffs were in fact consumed around lambing. Grain and concentrate creep feeding of lambs was uncommon in the sample. The corresponding figures for six flocks lambing in January and February are also shown. Data relating to the two ram breeding flocks are not included as the figures relating to them are distorted by summer feeding of ram lambs. Table 48 gives the breakdown of costs per ewe for the foodstuffs in Table 47.

Table 47 Average Quantities of Supplementary Foods Consumed per Ewe, 1966/67
(Averages per Flock)

Activity Type of Supplement	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Flocks	All Groups	January and February Lambing Flocks
	lb.	lb.	lb.	lb.	lb.	lb.	lb.
Concentrates	38	34	38	43	52	40	55
Barley	21	17	13	7	12	15	22
Oats	68	47	47	55	33	51	51
Draff	78	28	31	77	35	47	93
Total Concentrates, Grain and Draff	205	126	129	182	132	153	221
	lb.	lb.	lb.	lb.	lb.	lb.	lb.
Hay	11.5	24.7	24.1	8.9	9.1	17.1	23.0
Silage	87.5	6.8	49.1	-	-	38.3	42.8
	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.
Roots	12.0	9.2	9.7	2.5	6.1	9.0	11.2

Table 48 **Average Variable Costs of Supplementary Foods Fed per Ewe, 1966/67**
(Averages per Flock)

Activity Type of Supplement	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Flocks	All Groups	January and February Lambing Flocks
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Concentrates	-:12: -	-:10: 6	-: 9: -	-:12: 6	1: -: -	-:12: -	-:18: -
Barley	-: 3: 6	-: 3: -	-: 2: 6	-: 1: 6	-: 2: -	-: 2: 6	-: 4: -
Oats	-:10: 6	-: 8: 6	-: 9: -	-:10: -	-: 6: -	-: 9: -	-: 9: 6
Draff	-: 1: 6	-: -: 6	-: 1: -	-: 2: -	-: 1: -	-: 1: -	-: 1: 6
Total Concentrates, Grain and Draff	1: 7: 6	1: 2: 6	1: 1: 6	1: 6: -	1: 9: -	1: 4: 6	1:13: -
Hay	-: -: -	-: -: 6	-: 1: -	-: -: -	-: -: -	-: -: 6	-: -: 6
Silage	-: -: 6	-: -: -	-: -: 6	-: -: -	-: -: -	-: -: 6	-: -: -
Roots	-: 5: -	-: 3: 6	-: 3: -	-: 1: -	-: 4: -	-: 3: 6	-: 4: 6
Total Roughages and Roots	-: 5: 6	-: 4: -	-: 4: 6	-: 1: -	-: 4: -	-: 4: 6	-: 5: -
Total Supplementary Foods	1:13: -	1: 6: 6	1: 6: -	1: 7: -	1:13: -	1: 9: -	1:18: -

The average length of time over which concentrates, grain or draff were fed to the ewes was 12 weeks for all flocks in the sample. There was little variation in this period for the different activities, and for those the average ranged from 11.5 weeks in the case of the store lamb group to 13.2 weeks in the case of the fat lamb group. The period of feeding for the January-February lambing group was only a little longer averaging 14 weeks for the 6 flocks concerned and ranging from 10 to 20 weeks. From this it can be deduced that the average total quantities of concentrates, barley and oats fed daily to ewes were higher in the early fat lamb group, than in the other groups. In the January-February lambing flocks greater use was made of the more expensive proprietary concentrates. Note should also be taken of the use of draff, a relatively cheap distillery by-product available to farmers in the area of the study. One farmer in the early fat lamb group made no use of grain or concentrates for winter ewe feeding, relying on draff and other roughages only. In seven flocks creep feed was given to lambs, two of these being the ram breeding flocks. Of the others, four fell into the early fat lamb group and one into the late fat lamb group. On average 63 per cent of the lambs in the latter 5 flocks were sold before September 30th compared with an average of 24 per cent for the whole sample, but of the five, three lambed in February. In three cases a proprietary

concentrate was used and in two oats, one of the farms using oats only falling into the late fat lamb group.

With reference to the feeding of hay there was little systematic feeding of this product in 1966/67, its use being confined to relatively short periods after snow had fallen. In many cases where hay was offered, it was ignored by the ewes during this winter. Hay was fed on 21 of the farms only in 1966/67 and silage on six. Of the 56 farms in the sample maintaining ewes over the 1966/67 winter, 47 fed roots to the sheep, in three of the cases the flock being folded and in the remaining flocks being carted out. Of the farms using roots, five fed negligible quantities. Three flocks commenced feeding turnips before the New Year - two of these being in upland areas, while the other was an early lambing flock. In about a third of the flocks where roots were used feeding was commenced in January, mainly near the beginning of the month. In six flocks feeding of turnips were not fed until after the start of lambing. The length of time roots were fed depended to a certain extent on their availability, but twelve flocks carried on root feeding until the end of April and another eight continued into May.

The periods over which concentrate grain or draff feeding are carried out are subject to similar variation. One flock did not feed any at all, and two fed them during the lambing period only. Of the other flocks length of time over which these feeds were used varied between 3 weeks before lambing to 18 weeks before lambing, with about a quarter of the flocks commencing feeding of concentrates, grain or draff 6 weeks before lambing. The average length of feeding period before lambing commenced was 8 weeks. The length of time during which concentrate or grain feeding was continued after the commencement of lambing was largely dependent on the interval of time elapsing before grass growth recommenced, but the most prevalent time for cessation of concentrate feeding was the end of April.

The costs of grain, concentrates and draff form an important element in total variable costs of the ewe enterprise, comprising as they did 38.2 per cent of the total in 1965/66 and 36.0 per cent in 1966/67. In Table 49 the distribution of gross margins per ewe and per acre have been set out in relationship to expenditure on grain, concentrates and draff.

Table 49

Cost of Grain, Concentrates and Draff per Ewe and
Gross Margins per Ewe and Per Acre, 1966/67

Cost of Grain, Concentrates and Draff per Ewe	Number of Flocks	Average Gross Margin Per Ewe	Average Gross Margin per Acre for Ewe Flock
		£ s. d.	£ s. d.
Od. - £-:10: -	9	5:17: 6	17:10: 6
£-:10:11d. - £1: -: -	19	7: 7: -	19: -: -
£1: 0: 1d. - £1:10: -d.	11	7: 4: 6	15:18: 6
£1:10: 1d. - £2: -: -d.	11	5:14: 6	12:13: 6
Over - £2: -: -d.	6	7:19: 6	17:14: -

LABOUR

Taking all farms in the sample, including those with no ewe flock, it was found that the farmer himself was responsible for the bulk of the sheep work on 54 of the farms, sharing this in some cases with a son or brother. On 6 farms, the farmer's son, or in one case his nephews, performed most of the sheep work, and in only 3 cases were farm employees responsible for the bulk of the sheep work. In one of these cases, the hill-lowland enterprise with over 500 ewes, a full-time shepherd was employed. He undertook other duties on the farm during peak periods.

To assist the person primarily responsible for the sheep enterprise, other farm staff were used for work where handling of sheep was involved, for instance for such tasks as docking, drenching, clipping and dipping. However, on 15 of the 63 farms in the sample, no regular farm labour was employed. On these farms, except in two cases where the farmers did all sheep work without help, the farmers were assisted in work involving the handling of sheep by family labour (either fathers, sons or wives) or by neighbours on a reciprocal basis.

Since sheep in terms of gross output were very much of a minor enterprise in the farm businesses studied, it is important to examine their demands on labour relative to other enterprises on the farm. Accordingly the farmers in the survey were all asked if the requirements of labour for sheep clashed at any time with the demands for labour by other enterprises on the farm. Thirty three farmers in the survey replied in the negative. For the others a clash of varying intensity occurred in the spring at lambing time when this task coincided with

the spring peak of cultivation and sowing of crops. One farmer reported a clash at the time of turnip hoeing with clipping, one at haymaking with the needs of day-to-day supervision, while one of the ram breeders reported a clash at grain harvest with ram preparation. In all cases these clashes were met by extension of the farmer's working hours and, in only four instances, did farmers admit to the supervision of the sheep flock being neglected in favour of other enterprises.

The average monthly labour requirements per ewe in ewe flocks is shown in Table 50. The flocks are sub-divided according to their date of lambing in Table 51.

Table 50 **Average Monthly Labour Requirements per Ewe**
by Type of Production, 1966/67
(Hours per Ewe)

Month	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Flocks	All Flocks
No. of Flocks	14	12	17	5	8	56
	Hours per Ewe	Hours per Ewe	Hours per Ewe	Hours per Ewe	Hours per Ewe	Hours per Ewe
October	0.25	0.16	0.15	0.14	0.26	0.19
November	0.26	0.12	0.16	0.13	0.21	0.18
December	0.30	0.21	0.26	0.13	0.26	0.24
January	0.54	0.29	0.51	0.26	0.38	0.43
February	0.59	0.53	0.57	0.36	0.54	0.53
March	1.09	0.91	1.10	0.50	0.69	0.95
April	0.80	1.15	1.44	1.56	0.52	1.10
May	0.33	0.49	0.47	0.35	0.37	0.41
June	0.55	0.50	0.45	0.60	0.24	0.47
July	0.58	0.27	0.34	0.26	0.19	0.36
August	0.32	0.23	0.21	0.32	0.15	0.24
September	0.32	0.17	0.20	0.30	0.71	0.31
Total	5.93	5.03	5.86	4.91	4.52	5.41

Table 51 Average Monthly Labour Requirements per Ewe by Month of Lambing, 1966/67
(Hours per Ewe)

Month	January Lambing	February Lambing	March Lambing	April Lambing
No. of Flocks	3	5	22	23
	Hours per Ewe	Hours per Ewe	Hours per Ewe	Hours per Ewe
October	0.43	0.23	0.19	0.16
November	0.31	0.35	0.17	0.15
December	0.30	0.49	0.27	0.17
January	1.14	0.74	0.42	0.32
February	0.42	1.13	0.55	0.45
March	0.56	0.82	1.42	0.67
April	0.28	0.82	1.19	1.32
May	0.34	0.56	0.47	0.35
June	0.23	0.83	0.50	0.42
July	0.59	0.81	0.29	0.32
August	0.31	0.45	0.23	0.22
September	0.69	1.10	0.21	0.21
Total	5.60	8.33	5.91	4.76

The figures for labour requirements must be regarded as approximate, since it is difficult for farmers to give an accurate estimate of time spent on various activities, particularly for lambing where daily requirements vary so widely, and for day-to-day supervision, where the rounds of sheep might be combined with inspection of cattle. The total figure per ewe per annum is roughly similar to that appearing in published work elsewhere. The lower figure relating to the other flock group is partly due to the fact that in three of the flocks no sheep at all were held for some months of the year.

The peak of the labour demand occurs at lambing where in some flocks almost constant attention was required. Labour requirements for the remainder of the year are fairly evenly spread out over the months, the major handling tasks of docking, drenching, vaccination, clipping, dipping, selection of lambs for market and market attendance being well spread out over the spring, autumn and summer months, followed by the labour requirements for hand feeding during the winter months. Table 51 does not indicate any greater labour requirement per ewe during the main month of lambing for January or February lambing flocks, but the numbers of flocks in each of these groups is too small to give a fair comparison.

When the labour requirements per ewe are compared in terms of size of flock, as might be expected the average labour requirement per ewe decreases as the flock size increases. The time required for day to day supervision of a larger flock is little more than for a smaller one. Table 52 indicates labour requirements per ewe in the ewe breeding flocks grouped according to size of flock.

Table 52 Average Labour Requirements per Breeding Ewe in Relation to Size of Flock

	Number of Ewes Topped			
	0-50	51-100	101-150	Over 150
Number of Flocks	20	16	7	10
Average man-hours per ewe	No. 7.43	No. 5.22	No. 4.24	No. 3.31

MISCELLANEOUS VARIABLE COSTS

The miscellaneous variable costs consist of charges for veterinary attention, purchase of drugs and dip, casual labour employed for sheep (usually clipping is the only enterprise employing casual labour) and carriage of stock. It will be seen from Table 12 and 13 that the miscellaneous costs show little variation between the various activities except for the "other flocks" where the figure is higher on account of the special requirements of the two ram breeding flocks in that group.

COMPARISON BETWEEN BEST AND WORST BREEDING
EWE FLOCKS

To determine more precisely some of the factors influencing profitability, the top twelve and bottom twelve flocks from the early fat, late fat, store and breeding lamb activities have been selected on the basis of gross margin per acre in 1966/67. The best twelve farms included three in the early fat lamb group, three in the late fat lamb group, and six in the store lamb group, as compared with two in the early fat lamb group, four in the late fat lamb group, three in the store lamb group and three in the breeding lamb group for the worst farms. The average gross margins per ewe for the best and worst flocks were £8 4s. 6d. and £5 5s. 0d. respectively and these are set out in Table 53. Gross margins per forage acre were £24 9s. 0d. and £10 15s. 0d. respectively for the two groups.

The average size of flock in the best farms was 135 ewes, but these 12 included one flock with 602 ewes. Without this flock the remaining 11 flocks averaged 93 ewes, compared with an average of 69 ewes for the bottom 12 flocks. In the latter group there were four flocks with less than 30 ewes, but the smallest flock on the best farms was 35.

It cannot be assumed that the smaller flocks in the worst group received less attention than those in the best group since the average number of direct man hours employed per ewe in the bottom flocks was 6.76 as against only 3.97 in the top flocks. More labour per ewe is used in smaller flocks since day to day supervision requirements are fairly constant.

If it can be accepted that the figure for management and investment income for a farm is a measure of the efficiency of the farm business as a whole, then it is interesting to note that the average management and investment income per acre for the top flocks was £5 19s. 0d. per acre compared with £2 10s. 0d. per acre for the bottom flocks.

The possibility of greater profitability stemming from a Suffolk-Half-bred crossing policy has been suggested earlier in this report. This is further indicated by the preponderance of this cross on the best farms.

Breeds of ewe and ram used were as follows:

Best flocks:-

6	Suffolk	x Half-bred
1	Suffolk	x N. C. Cheviot and Half-bred
4	Suffolk	x Greyface
1	Border Leicester	x Blackface

Worst flocks:-

1	Suffolk	x Half-bred
1	Suffolk	x N. C. Cheviot and Half-bred
2	Suffolk	x Greyface and Half-bred
3	Border Leicester	x Blackface
5	Border Leicester	x N. C. Cheviot

Output , variable costs and gross margins for the best 12 and worst 12 flocks in the designated groups are set out in Table 53.

Table 53 **Average Output, Variable Costs and Gross Margin Per Ewe**
For Best 12 and Worst 12 Flocks
1966/67

	Best 12 Flocks	Worst 12 Flocks
Average number of ewes per flock	135	69
	£ s. d.	£ s. d.
<u>OUTPUT</u>		
Subsidies	--: 1: -	--: 3: -
<u>Sales</u>		
Lambs	7: 7: 6	4:14: 6
Ewes	1:12: 6	1: 3: -
Rams	--: -: 6	--: 3: -
Wool	1: 8: -	1: 4: -
Total Subsidies and Sales	10: 9: 6	7: 7: 6
Closing Valuation - Lambs	2:16: 6	3:18: 6
Breeding Stock	7:18: 6	5: 2: 6
Total Closing Valuation	10:15: -	9: 1: -
TOTAL (A)	21: 4: 6	16: 8: 6
<u>Purchases</u>		
Lambs		
Ewes	2:19: -	1: 7: 6
Rams	--: 3: 6	--: 3: 6
Total Purchases	3: 2: 6	1:11: -
Opening Valuation - Stock	6:18: -	6: 2: 6
TOTAL (B)	10: -: 6	7:13: 6
OUTPUT (A - B)	11: 4: -	8:15: -
<u>VARIABLE COSTS</u>		
<u>Purchased supplements</u>	--:10: 6	--:12: -
<u>Homegrown Supplements</u>		
Grain	--: 9: -	--:16: -
Roughages and roots	--: 3: 6	--: 4: 6
Total Homegrown supplements	--:12: 6	1: -: 6
Grazing	1: 7: -	1: 8: 6
Total Food and Grazing	2:10: -	3: 1: -
Miscellaneous Costs	--: 9: 6	--: 9: -
TOTAL VARIABLE COSTS	2:19: 6	3:10: -
GROSS MARGIN PER EWE	8: 4: 6	5: 5: -
GROSS MARGIN PER FORAGE ACRE	24: 9: -	10:15: -

Examining individual items of output and cost, the first element is that of flock depreciation which amounted to 9s. per ewe for the year in the top 12 flocks as compared with £1 5s. in the worst flocks. Flock depreciation is determined largely by the valuations, which must be arbitrary figures. In the worst flocks the age of ewes was higher than in the top 25 per cent of flocks. One farmer in the best group bought Half-bred gimmers at £8 10s. each in the low priced 1966 season and sold them the following year for £10 1s. 6d. per head, while in another flock in this group, three-quarters of the females put to the ram in the autumn of 1966 were ewe lambs bought at £5 18s. 9d. per head, half of which were sold the following year for £11 17s. 7d. Losses of ewes were also slightly higher on the worst farms, 6.4 per cent of the ewes in the opening valuation being lost over the year compared with 4.8 per cent for the top 12 flocks. In the bottom flocks group a relatively high number of ewes was unaccounted for.

The value of lambs produced per ewe depends partly on the number of lambs per ewe and the average value per lamb. The average value of lambs produced per ewe was £10 4s. in the top 12 flocks and £8 13s. in the bottom 12. This is mainly accounted for by the better average lambing percentage in the best flocks where 154 per cent of lambs were docked as a proportion of the ewes tupped, compared with 136 per cent for the worst 12. In the upper group, nine of the flocks were flushed before tupping, but only six in the lower group. One flock in the best group had a lambing percentage of only 69, this being the predominantly ewe lamb flock referred to above, the low lambing percentage being compensated for by the appreciation in ewe value over the year. Mortality of the lambs both before and after docking showed little variation between the groups, averaging 7.9 per cent and 7.3 per cent respectively before docking and 1.24 per cent and 1.22 per cent after. One of the farms, with a very small flock, in the bottom group, situated in upland country, lost 19.3 per cent of lambs born dead. The flock of predominantly ewe lambs mentioned earlier lost 15 lambs out of 85 born i.e. 17.6 per cent. Another of the best 12, also a flock in upland country, lost 20 lambs out of 147, mainly weaklings at birth. The actual average number of lambs per ewe sold or on hand at 30th September, 1967 was 1.51 for the top group and 1.35 for the bottom. The average values of lambs sold are shown in Table 54.

Table 54

Average Values of Lambs Sold or On Hand at 30/9/67

Best 12 and Worst 12 Flocks

(Per Lamb)

	Sold Fat Before 30/9/67		Sold Store Before 30/9/67		On Hand 30/9/67		All Lambs	
	No. of Lambs	Average Value	No. of Lambs	Average Value	No. of Lambs	Average Value	No. of Lambs	Average Value
Best 12 Flocks	513	£ s. d	733	£ s. d	1,126	£ s. d	2,372	£ s. d
Worst 12 Flocks	188	7: 7: 6 6:18: 6	514	6: 7: 6 6: 9: 6	431	6: 4: 6 6: 1: -	1,133	6:10: 6 6: 8: -

It can be seen that the average value per lamb on a per lamb basis differs little between the top and bottom groups, but on an unweighted basis with the same emphasis for each flock, the margin widens. The average value of lambs for the top twelve flocks on this basis is £6 14s. 6d. as against £6 8s. 6d. for the bottom 12.

With reference to costs, the main variable items are supplementary foods and grazing. For supplementary foods a marked difference in amounts of concentrate foods fed occurs, the average total value of concentrates, grain and draff fed to the best 12 flocks being 23s. per ewe and 32s. 6d. per ewe for the worst 12. The actual amounts fed in the two groups are shown in Table 55.

Table 55

Amounts of Supplementary Foods Fed Per Ewe to Best 12 Flocks
and Worst 12 Flocks, 1966/67

Type of Food	Best 12 Flocks	Worst 12 Flocks
	lb.	lb.
Concentrates	31	36
Barley	18	19
Oats	40	69
Draff	2	52
Total Concentrates, grain and draff	91	176
Hay	13	32
Silage	37 cwt.s.	- cwt.s.
Roots	9.8	8.8

Eighty-nine lbs. of concentrates and grain are fed in the top group compared with 124 lbs. in the bottom group. In addition 50 lb. more of low priced draff is fed to the bottom group. Consumption of other roughages is only slightly higher in the bottom group.

Grazing costs per ewe are also higher in the bottom group at £1 8s. 6d. per ewe compared with £1 7s. 0d. in the upper group. Fertiliser applications per acre are higher on the farms with the top 12 flocks, and this is accompanied by higher stocking rates, as summarised in Table 56.

Table 56 Average Rates of Application of Nitrogen to Grazing, Hay and Silage and Average Stocking Rates, Best 12 and Worst
12 Flocks, 1966/67

	Best 12 Flocks	Worst 12 Flocks
	<u>Units per acre</u>	<u>Units per acre</u>
Nitrogen to ordinary grazing	35	20
Nitrogen to silage	91	45
Nitrogen to hay	45	41
Ewes per grazing acre winter	No. 2.10	No. 1.38
Ewes per grazing acre summer	3.60	2.21
Ewes per forage acre whole year	2.97	2.10

Marked differences in flock depreciation, amounts of grain and concentrates fed, carrying capacity, lambing percentages and value per lamb occur between the best and worst flocks. Mortality of ewes and lambs shows little variation between the two groups.

OTHER FLOCKS

Although figures for "other flocks" have been included in many of the tables appearing in this report, most of the discussion has been limited to the flocks falling within the activities of early fat lamb production, late fat lamb production, store lamb production and breeding lamb production. The other activities will now be summarised.

Two small flocks produced ram lambs as the major output of their sheep enterprise. Of these, one was producing both Oxford and Suffolk rams in addition to running a small number of Suffolk/Half-bred cross ewes producing lambs sold fat early in the season. The other had a Border Leicester flock. Both were small in scale with, in 1966/67, 56 and 32 ewes tupped respectively. Both flocks lambed early and had the high concentrate and grain feeding associated with early lambing, in addition to a requirement for grain and concentrate feeding of the ram lambs over the summer season. Profitability of such enterprises largely depends on whether the prices of the rams sold offsets the additional expense of high priced foodstuffs. There is also an extra requirement for labour in preparing rams for sale and, on one of the farms, this caused a definite clash at harvest time. On the one farm with the supplementary early fat lamb sales, by virtue of a higher average price per lamb sold (£13 1s. 6d.) and with grain and concentrate use per ewe at only twice the overall average, a gross margin of £37 14s. per acre was achieved in 1966/67. In the other flock, concentrate feeding of purchased foods was much heavier at £6 5s. 6d. per ewe and with an average price per lamb sold, on hand at September 30th of only £10 4s., the gross margin per forage acre for 1966/67 was relatively low at £9 5s. 6d.

In 1966, two, and in 1967, one farmer purchased ewes with lambs at foot for sale later in the season. The gross margins were between £24 and £27 per forage acre in these three cases. In one case a small amount of concentrates and grain, valued at 2s. 6d. per ewe, was fed after the sheep had been bought. This farm followed the system in 1966 only and in the following winter ran dry ewes for fattening, without supplementary feeding. On the other farm additional lambs were bought in at the end of the season for winter fattening, so both farms had a sheep enterprise nearly all the year round, but devoid of the difficulties associated with lambing. Cast North Country Cheviot ewes with

Suffolk/Cheviot lambs at foot were bought in the first case and 95 ewes with 162 lambs showed a margin of £480 13s. between buying and selling, including receipts from the sale of wool. With variable costs deducted this yielded a gross margin of £3 17s. per ewe or £2. 14s. 4d. per forage acre, the ewes being sold after weaning of the lambs in July. The second farm purchased younger Half-bred ewes with Half-bred/Suffolk lambs, in both years. The output from 89 ewes and 152 lambs in 1966 was £654 5s. with a gross margin per ewe of £5 15s. 5d. and per forage acre of £26 5s. In 1967, 117 ewes and 189 lambs produced an output of £1,081 18s. giving a gross margin of £7 8s. per ewe and £24 6s. per forage acre. In both years this flock had lambs on hand at September 30th.

Two farms in the survey in 1966/67 based their sheep enterprise on the earlier stage of the previous system. On these farms, a small number of cast ewes, Blackface in one case and North Country Cheviot in the other, were purchased in autumn and sold with lambs at foot in spring. Gross margins were low at £2 10s. and £1 7s. per ewe. In the first case an unusually bad lambing, with a percentage of only 93, reduced the returns for the couples to £7 13s. per ewe with lambs (in the previous system the price paid per ewe with lambs averaged £11 12s.). In the other small flock only three-quarters of the ewes were put to the ram and the lambing percentage of those tupped was 83. The average purchase price of the ewes on the two farms was £2 14s. and £2 0s. 6d. respectively, and it is probable that these ewes were too broken down to perform well even on the better conditions of the lowland farm.

One farmer with an exceptional interest in sheep engaged in the purchase of top Half-bred ewe lambs in one season and their sale as maiden gimmers in the next. The output on an enterprise of this nature is made up of the difference between the buying and selling price of the females plus the receipts for the wool. In fact, the latter averaged 10.25 lb. per fleece in 1966/67 with a return of £2 0s. 6d. per lamb bought, compared with the average of £1 6s. 6d. for all flocks. The difference between buying and selling price was £2 16s. in 1965/66 when the gimmers were sold in a poor season, although still fetching well above average prices, and £4 14s. 6d. the following season when the reverse applied. Taking into account deaths, output per head was £4 12s. in 1965/66 and £6 5s. in 1966/67, which with

variable costs deducted gave a gross margin per head of £3 2s. and £4 15s. for the two years. Without lambs at foot in the summer, a higher stocking rate than for normal ewe flocks could be maintained and the gross margins per forage acre were £13 1s. 6d. and £17 18s. per forage acre in 1965/66 and 1966/67 respectively.

The farm purchasing ewes for fattening over the winter purchased old North Country Cheviot ewes at £2 9s. 6d. per head in October 1966 and sold them in February 1967 for £4 18s. 5d. No feeding apart from grass was given to the flock. The gross margin per ewe was £1 15s. 4d., giving a comparable return per head to that obtained from flocks fattening lambs over this period.

A final farm studied in 1966/67, atypical of the sample, was one unit of over 500 ewes, split into a hill flock of Blackface ewes and a lowland flock of mainly Greyface ewes drawing its replacements from the hill flock and selling fat lambs over the summer and winter months. Separation of the two flocks for gross margin purposes has not been attempted, and with home-bred lambs fattened during the winter being included an overall gross margin of £5 14s. per ewe and £12 2s. per acre was achieved. This excluded the cost of a shepherd, who was employed also on other duties at peak times. Part of the lowland flock was run on a forward creep grazing system at 7.5 ewes and their lambs to the acre.

CHANGES IN POLICY

In order to assess the extent to which farmers were prepared to alter their sheep enterprise policy in the face of economic pressures or new technical developments, each co-operator was asked if any major change had been effected within the previous ten years or if any changes were being contemplated.

Of the 63 farmers co-operating in the survey, 54 had either made a major policy change in relation to the sheep enterprise or were contemplating a change in the near future. Where changes have been executed these may be classified under the heads of reduction or enlargement of the enterprise, changes in breed with or without a change in type of activity, or permanent changes in replacement policy. Again, other farmers were contemplating the elimination of the sheep enterprise.

Reduction in Scale of Sheep Enterprise

Four farmers had reduced on a permanent basis the size of their ewe breeding flocks. In three cases this reduction had been done primarily to free grass for use by cattle which were a more important enterprise, while in one case this policy had been implemented to reduce labour requirements at lambing, the farmer in this case being in his seventies. This change has been accompanied by the introduction of creep grazing and an extension of the barley acreage. In another five instances, the farmers stated that they were contemplating a reduction in the size of their ewe flock because of doubts about its profitability. On one of these farms it was felt the sheep unit had exceeded the size required of a scavenging unit and on the others the flock was to be reduced in order to expand grain acreage and/or increase cattle numbers.

Elimination of Sheep From the Farm Business

Six farmers were giving serious consideration to the disposal of their sheep flock altogether. In four instances this was being contemplated because of doubts about profitability, and in two cases to allow for more rational management of the farm as a whole, the clash for available labour at lambing time being mentioned in one of these instances. All these farms were running ewe breeding flocks, two of them producing Half-bred breeding lambs from a Border Leicester/North Country Cheviot cross.

Expansion In Scale of Sheep Enterprise

On the other hand, ten farmers had expanded their sheep units. In one of these instances the farmer had discarded from his business a small ewe flock as part of a reorganisation aimed at expanding the grain area, but in the face of declining yields from a longer sequence of barley crops, had reintroduced sheep on to the farm. Two other farmers had increased sheep numbers in the form of purchased lambs for autumn and winter fattening as a result of an increase in aftermath acreage available arising from an increase in the area of silage or hay. In one case sheep numbers had been expanded as a result of the acquisition of further land and reclamation of existing land, and on another sheep numbers were increased as a result of the introduction of a system of forward creep grazing enabling larger numbers to be held on a static acreage. Two farmers increased their flocks with the avowed object of boosting overall farm profits, in one case in anticipation of higher sheep prices being obtained as national flock numbers declined. In another instance a personal preference for sheep had resulted in a small flock of 20 ewes being quadrupled in size over a period of six years. Increased availability of labour affected the decision of one farmer to increase the size of his enterprise.

One farmer who had been on his farm for fifteen years without a sheep flock adopted a winter hogg fattening policy with the prime object of utilising surplus growth and stubbles at the back-end of the year.

Change of Breed

Twelve farms had changed their breed of sheep during the past ten years and three more were contemplating such a change. This is nearly a quarter of the farms in the sample, and indicates some degree of flexibility to counter economic and management difficulties as they occur.

Four of these farms had been engaged on the Half-bred breeding ewe lamb trade, but as a result of the decline in prices for Half-bred ewe lambs had changed or were in the process of changing from a Border Leicester x Cheviot policy to a Suffolk x Half-bred policy and production of fat lambs. Two other farmers were contemplating taking this step. One other farmer was in the process of changing from a Border Leicester x Cheviot to a Suffolk x Greyface policy for similar reasons. Two farms within the same family, producing store lambs, had changed from Cheviot, eliminated because of its tendency for wool loss, to Blackface,

eventually discarded because of its poor performance, to Greyface; which was being crossed with a Suffolk ram. On one farm Greyface ewes were being substituted for Half-bred ewes as it was felt that the larger lambs produced by the latter ewes were going out of favour, but the farmer concerned had had reservations about the decision due to a reduction in overall returns from lambs from the new cross. One farmer was making the converse change, from Greyface ewes to Half-breds in order to secure better returns per lamb. One farm with some rough hill grazing had changed from Greyface to the hardier Blackface to cope better with local conditions. Another farm on lower ground producing store and breeding lambs had changed from Blackface to Cheviot, crossed with Border Leicester, and as a result large increases in lambing percentages had been reported. Finally, one farm with Suffolk cross ewes which were crossed with an Oxford tup for early fat lamb production was changing to pure Suffolk ewes for an expansion of a more profitable ram breeding unit.

Three other farms had made what were described as experimental breed changes. On one of these the change involved the purchase of Half-bred lambs for autumn and winter fattening instead of Suffolk/Half-bred crosses, but this move had been regarded as unsuccessful, difficulty being found on this particular farm in finishing the Half-bred economically. Yet another farmer had introduced Greyface instead of Half-breds for the Suffolk cross, but was reverting to his previous policy. Finally, one farmer had just introduced a Greyface x Oxford cross on a trial basis.

Change in Activity

On four farms a change of policy was effected by elimination of the ewe breeding flock and its substitution by a winter fattening enterprise. One of these substitutions was introduced due to the inability of the farmer to obtain satisfactory lambing percentages (0.7 lambs sold per ewe in 1965/66); in another case the change was the result of the reserving for silage of a greater area of grass in the summer; a third farmer made the change on account of ill health and his inability to cope with the requirements of lambing in a rigorous climate; finally one farmer was making the change on account of the suspected unprofitability of his ewe flock. Two other farmers were contemplating the change - one because of the clash for labour at lambing and one because of the

suspected unprofitability of the ewe flock. The converse change from a winter enterprise of fattening lambs to maintenance of a breeding flock had been made on one farm, mainly because the farmer felt the interest factor was higher in a breeding flock. One other farmer had eliminated the purchase of lambs, which supplemented the output of home reared lambs for autumn and winter fattening, and increased his ewe flock on the grounds that the lambs could be obtained cheaper by this method. One other farmer, presently purchasing lambs for winter and autumn fattening, was contemplating the addition of a ewe flock, mainly for interest reasons and to absorb surplus labour. Two farmers in upland areas were contemplating a change from an all year round breeding flock to a winter flying breeding flock in order to increase the grass acreage available for cattle in the summer months.

Change in Replacement Policy

Many farmers employed a flexible replacement policy adjustable to prevailing market trends, but six had made permanent changes in five of these instances to a younger class of ewes than had hitherto been bought. One farmer had changed from the purchase and breeding of ewe lambs to the purchase of gimmers in order to increase lambing percentages. Another had made the converse change on account of the price differential between ewe lambs and gimmers. One farmer had made a change from the purchase of old ewes to ewe lambs. Three had converted from the buying of old ewes to gimmers, and were not altogether satisfied with the change, which was said to have resulted in poorer performance at lambing. In one further instance, the farmer was contemplating a change to the purchase of younger ewes from a cast ewe replacement policy in order to reduce his winter feeding requirements.

Summary

The above indicates a complex pattern of changes, with converse movements occurring in many cases. It is difficult, if not impossible, to quantify the effects of these changes since most of them occurred before the period of the survey or, if occurring during the survey, because insufficient data are available to assess their effects on farm profits as a whole. If any one pattern does emerge it is reflected by a feeling in

the minds of several of the farmers that sheep in their own right are comparatively less profitable than they have been in the past. Complementary to this there is the change from the Border Leicester/Cheviot policy to one of introduction of the Suffolk ram crossed with either the existing Cheviot ewe flock, or with Half-breds introduced to replace the North Country Cheviot female element in the flock. It remains to be seen whether the recent revival in Half-bred ewe lamb prices will arrest this trend.

PRODUCTION OF FAT LAMBS AND HOGGETS
IN THE WINTER AND AUTUMN PERIOD

On 33 of the farms with a breeding ewe flock, lambs remained on hand at 30th September, 1966, for disposal after that date, and on 8 of these farms additional store lambs were purchased for later sale as fat lambs or hoggets. Six other farmers, who did not have a flock of ewes, purchased lambs for fattening over the autumn and winter. In the following discussion only those flocks from which 20 or more lambs were sold fat over the autumn and winter period have been considered, comprising a total of 31 flocks.

Activities

The activities may be classified into three main categories:-

1. Flocks where more than 50 per cent of the lambs on hand at October 1st or purchased after that date were sold fat before 1st January with little or no feeding of roots.
2. Flocks where more than 50 per cent of the lambs on hand at October 1st or purchased after that date were sold fat after 31st December with little or no feeding of roots.
3. Flocks where more than 50 per cent of the lambs on hand at October 1st or purchased after that date were sold fat after 31st December with feeding of roots.

The fattening of lambs on rape was not encountered on any farm in the survey.

In the first group it was the flocks where the lambs were wholly home reared that predominated. Of the 13 flocks with this activity, 11 were made up entirely of home reared lambs and 2 comprised wholly purchased flocks. Similarly of the four flocks where grass was the main non-concentrate food, but where most of the lambs were not sold until after the New Year, three of the flocks were made up entirely of home-bred lambs and one was a mixture of home-bred and purchased lambs. In the third group, only four of the fourteen flocks consisted wholly of home-reared lambs, the remainder being a mixture of home-bred and purchased lambs (six flocks) or wholly purchased (four flocks).

Output, Variable Costs and Gross Margins

Table 57 sets out the average output, variable costs and gross margins per lamb. One large flock included in the third group actually sold more lambs before the New Year than after, but fed quantities of turnips to the remaining lambs and has been grouped there rather than creating a separate activity.

The average size of flock was over twice as big in the third group where there were five flocks with over 200 lambs, including one with 625. In the other groups there was only one other flock with more than 200 lambs and only two others with more than 100 lambs.

It can be seen that the average weight per lamb shows little difference from those recorded for lambs sold before September 30th as set out in Table 34. The averages conceal a range in weights from a batch of Shetland/Suffolk lambs averaging 40 lb. to a batch of Half-breds sold in May at 63 lb.

The output of these flocks is very much affected by the price at which the lambs are entered in the opening valuation. In 25 of the 31 flocks made up partly or wholly of home-bred lambs an arbitrary valuation had to be used. The results depend largely on the accuracy of these valuations. This factor is eliminated in those flocks where all the lambs have been purchased and Table 58 presents the corresponding figures for these flocks.

Table 57

Average Output, Variable Costs and Gross Margin
per Lamb for Autumn and Winter Fattened Sheep, 1966/67

	Off Grass Mainly Before 1/1/67	Off Grass Mainly After 31/12/66	Roots Mainly After 31/12/66	All Flocks
Total Number of Lambs	1,051	256	2,493	3,800
Number of Flocks	13	4	14	31
Average Number of Lambs per Flock	81	64	178	123
	lb.	lb.	lb.	lb.
Average Deadweight of Lambs	51.2	48.2	50.3	50.4
OUTPUT	Per Lamb £ s. d.	Per Lamb £ s. d.	Per Lamb £ s. d.	Per Lamb £ s. d.
Sales				
Fat Lambs or hoggets	7: 0: 6	7: 3: 6	7:10: 0	7: 5: 0
Store Lambs	--: 2: 0	--: 1: 6	-	--: 1: 0
Total (A)	7: 2: 6	7: 5: 0	7:10: 0	7: 6: 0
Purchases				
Store Lambs	--: 3: 0	--: 5: 0	1: 2: 0	--:12: 0
Opening Valuation	6: 1: 0	5: 9: 6	4: 4: 0	5: 2: 6
Total (B)	6: 4: 0	5:14: 6	5: 6: 0	5:14: 6
OUTPUT (A - B)	--:18: 6	1:10: 6	2: 4: 0	1:11: 6
VARIABLE COSTS				
Purchased Supplements	-	--: 3: 0	--: 3: 0	--: 1: 6
Homegrown Foods				
Grain	--: 1: -	--: 5: 0	--: 6: 0	--: 4: 0
Roughages and roots	-	-	--: 3: 0	--: 1: 6
Total Homegrown Food	--: 1: 0	--: 5: 0	--: 9: 0	--: 5: 6
Grazing	--: 2: 6	--: 6: 0	--: 2: 6	--: 3: 0
Total Food and Grazing	--: 3: 6	--:14: 0	--:14: 6	--:10: 0
Miscellaneous Costs	--: 1: 6	--: 1: 6	--: 2: 0	--: 1: 6
TOTAL VARIABLE COSTS	--: 5: 0	--:15: 6	--:16: 6	--:11: 6
GROSS MARGIN PER LAMB *	--:13: 6	--:15: 0	1: 7: 6	1: 0: 0

*See Appendix II for Standard Errors

Table 58 Average Output, Variable Costs and Gross Margin per Lamb
for Autumn and Winter Fattened Sheep, 1966/67. (All lambs purchased)

Total Number of Lambs		744
Number of Flocks		6
Average Number of Lambs per Flock		124
Average Deadweight of Lambs per Flock		50.9 lb.
		<u>Per Lamb</u>
		£ s. d.
<u>OUTPUT</u>		
<u>Sales</u>		
Fat lambs or hoggets	(A)	7:17: 0
<u>Purchases</u>		
Lambs		1: 9: 6
Opening Valuation		<u>3:10: 6</u>
Total	(B)	5: 0: 0
OUTPUT (A - B)		<u>2:17: 0</u>
<u>VARIABLE COSTS</u>		
Purchased concentrates, grain and draff		-
<u>Homegrown Foods</u>		
Grain		-: 6: 6
Roughages and roots		<u>-: 3: 0</u>
Total Homegrown Food		-: 9: 6
Grazing		<u>-: 4: 6</u>
Total Food and Grazing		-:14: 0
Miscellaneous Costs		<u>-: 2: 6</u>
TOTAL VARIABLE COSTS		<u>-:16: 6</u>
GROSS MARGIN *		<u>2: 0: 6</u>

*See Appendix 11 for Standard Error

In the case of Table 58 and where purchased lambs are among those appearing in Table 57, they appear in the opening valuation at cost price when purchased before October 1st. Any variable costs incurred before that date are included in the appropriate cost items.

Opening Valuation and Purchase of Sheep

The sum of purchases and opening valuation of lambs in the early sold group is higher than the other two groups, being a reflection of the more forward condition of these lambs at October 1st. Where the 6 purchased flocks have been isolated in Table 58 it can be seen that the sum of purchases and opening valuation (in effect the average purchase price) is lower than the average for the sample. This is accounted for by the fact that four out of six of these flocks purchased lean hill lambs, mainly Greyface. One farmer, selling mostly before Christmas, purchased top Suffolk cross lambs. The gross margin per lamb in the latter case was 18s. 0d. compared with the average for the six farms of £2 0: 6d.

Taking all flocks where lambs were bought, Table 59 compares the purchase prices, on a weighted basis, by breeds of all lambs bought.

Table 59 Average Purchase Price of All Lambs by Breed, 1966/67
(Per Lamb)

Breed	No. of Farms	Number of Lambs	Average Purchase Price
North Country Cheviot	1	132	£ 8: 0
Half-bred	1	99	3: 6: 6
Greyface	6	446	4: 9: 0
Suffolk Cross	4	471	6: 4: 0
Suffolk-Shetland Cross	2	148	4: 7: 0
Totals	14	1,296	5: 0: 6

The table illustrates the premium that has to be paid for the Suffolk cross lambs as compared with types being reared on poorer country.

Selling Prices

In the early sold group 68.6 per cent of the lambs were sold before the New Year at the time when overall receipts per lb. were at a lower level than those sold later. No lambs in this group were sold later than March. In the group where sales occurred mainly after the New Year, chiefly off grass, only 19.4 per cent were sold in the lower priced pre New Year quarter, but in one of the four flocks in this group, one farm had exceptionally low returns. Excluding this flock the average return per lamb for each flock was £7 10s. In the root group 39.4 per cent were sold before January 1st and for the lambs shown in Table 58, 32.6 per cent.

It was not possible in all cases to distinguish the breeds sold, but a breakdown of the selling prices on a weighted basis by breed is given in Table 60.

Table 60 Average Selling Price of All Fat Lambs and Hoggets by Breed
(Per Lamb or Hogget)

Breed	No. of Farms	Number of Lambs or Hoggets	Average Selling Price
			£ s. d.
Half-bred	2	139	9:16: -
Greyface	6	374	7:16: 6
Suffolk/Half-bred	11	1,035	7:13: -
Suffolk/Greyface	3	912	7:14: -
Mixed	11	1,249	7: 4: 6
Totals	33	3,709	7:10: 6

The high Half-bred figure is due to the effect of one farm where ninety hoggets were sold in April and May at an average price of £10 18 The receipts for Greyface lambs show up well in comparison with the Suffolk/Half-bred and Suffolk/Greyface lambs.

For the four farms purchasing and selling Greyface lambs the average buying and selling prices of all the lambs was as follows:-

Average buying price £4 10s. 0d.

Average selling price £8 0s. 6d.

This leaves a wide feeder's margin of £3 15s. 6d. to cover costs.

Feeding

The amounts of concentrates, grain, draff and roughages fed are set out in Table 61. However, it should be noted that the figures relate to lambs kept for varying periods on the farm.

Table 61 **Average Quantities of Supplementary Foods Consumed per Lamb for**
Autumn and Winter Fattened Lambs, 1966/67
(Averages per Flock)

	Off Grass Mainly Before 1/1/67	Off Grass Mainly After 31/12/66	Roots Mainly After 31/12/66	All Flocks
	lb.	lb.	lb.	lb.
Concentrates	-	7	12	7
Barley	2	4	10	6
Oats	3	38	23	16
Draff	-	-	4	2
Total Concentrates, Grain and draff	5	49	49	31
	lb.	lb.	lb.	lb.
Hay	-	-	9	4
	cwt.	-	cwt.	cwt.
Roots	0.6	-	7.5	3.6

The general pattern of feeding which is discernible is the use of minimal supplementary feeding before the end of December. 13 of the 31 flocks did commence feeding grain or concentrates before then, four in the early sold group, one in the later sold grass group and eight in the root fed group. The North of Scotland College of Agriculture's Advisory Leaflet No. 38 recommends that lambs kept on after the New Year should receive concentrated trough feeding of $\frac{1}{2}$ to $1\frac{1}{2}$ lb. daily of grain and concentrates 6 to 8 weeks before slaughter or earlier. The actual quantities fed to lambs in this sample conform fairly closely to these scales, but the most common length of time of feeding was 12 weeks over the flock as a whole with some of the lambs despatched earlier obviously receiving less than this. Draff was used for only two flocks, and for only one on any scale. Amounts of grain and concentrate fed daily, amounted to between $\frac{1}{4}$ - $1\frac{1}{2}$ lb. daily per head.

Hay feeding on a systematic basis was carried out in only three of the flocks, being used elsewhere only when snow was lying on the ground.

Roots were fed to seventeen of the flocks, being carted out in fourteen

cases. Feeding of roots commenced before the New Year in ten of the flocks.

The general grazing policy adopted was use of aftermaths for as long as possible followed by rotational use of other grass on the farm. Five of the earlier sold flocks were able to sell all of the lambs off aftermath without having to resort to the use of other grass. Only five of the farms confined their flock to a limited grazing area while feeding, the rate of stocking being between 6 - 8 lambs to the acre after the New Year, gradually reducing in intensity as the lambs were sold.

Total variable food costs for the four flocks buying and selling Greyface lambs averaged 16s. 6d., compared with an average of 10s. 0d. for all flocks in the sample.

Animal Health

Little in the way of extra preventative treatment was afforded to lambs after October 1st. On six of the thirteen farms where all or part of the lambs were bought, these purchased lambs were drenched after arrival. On four, vaccination against clostridial diseases was effected. In five of the thirty-one flocks winter dipping was carried out.

Mortality in the sample was low averaging only 1.7 per cent per flock or 2.0 per cent of all lambs in the sample. The average mortality per flock in each of the groups was:-

Mainly off grass before 1st January	0.4 per cent
Mainly off grass after 31st December	2.2 per cent
Turnips fed after 31st December	2.7 per cent

Fixed Costs and Profits

The gross margin figures do not include any allowance for labour, tractor costs, rent or overheads. Some of the fixed costs comprising these items would have been incurred whether the late lamb fattening enterprises had been part of the farm activities or not. In the absence of alternative enterprises, the autumn and winter fattening enterprise can be regarded as a means of spreading the overheads of the farm business and of utilising fixed resources, particularly labour and land, that might otherwise be unused. Nevertheless, many of the fixed costs would be avoidable in the absence of a winter sheep fattening unit and,

accordingly, fixed costs are presented in Table 62. The output, variable costs, gross margin, fixed costs and profit per lamb are set out in Table 62.

Table 62 Average Output, Variable Costs, Gross Margin, Fixed Costs and Profit per Lamb for Autumn and Winter Fattened Sheep, 1966/67

	Off Grass Mainly Before 1/1/67	Off Grass Mainly After 31/12/66	Roots Mainly After 31/12/66	All Flocks
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Output	-:18: 6	1:10: 6	2: 4: -	1:11: 6
Variable Costs	-: 5: 0	-:15: 6	-:16: 6	-:11: 6
Gross Margin	-:13: 6	-:15: 0	1: 7: 6	1: 0: 0
Fixed Costs	-:10: 0	-:16: 0	1:13: 0	1: 1: 0
Profit (+) or Loss (-) *	(+) 3: 6	(-) 1: 0	(-) 5: 6	(-) 1: 0

*See Appendix II for Standard Errors. The relative magnitude of these Standard Errors indicates that the averages above should be treated with caution.

On this full enterprise costed basis the only group to record a profit is that where the lambs are sold mainly before the New Year. The high fixed costs associated with root cultivation produced a loss of 5s. 6d. per lamb in the group sold after the New Year with root feeding.

The corresponding figures for the purchased lambs are as follows:-

Table 63 Average Output, Variable Costs, Gross Margin, Fixed Costs and Profit per Lamb for Autumn and Winter Fattened Sheep, 1966/67
(All Lambs Purchased)

	£ s. d.
Output	2:17: 0
Variable Costs	-:16: 6
Gross Margin	2: 0: 6
Fixed Costs	2: 2: -
Profit (+) or Loss (-)	(-) 1: 6

A loss of 1s. 6d. is recorded. For the four farms purchasing and selling Greyface lambs the gross margin averaged £2 4s. 0d. and fixed costs £2 8s. 6d., to give an overall loss of 4s. 6d. per lamb. Thus if full enterprise costing is employed the higher feeder's margin and gross margin obtained from fattening these lower priced lambs is offset by the considerably higher level of fixed costs.

APPENDIX I

Table (1)

Average Cropping per Farm, 1967

	Types of Sheep Production							
	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Ewe Flock Enterprises	Other Flocks	Purchased Lambs Only	All Farms
Number of Farms	14	12	17	5	8	1	6	63
<u>Crop</u>	acres	acres	acres	acres	acres	acres	acres	acres
Wheat	3.1	2.8	1.7	2.0	4.6	-	-	2.4
Barley	40.3	103.2	33.3	28.9	56.0	9.0	38.4	50.7
Oats	14.9	19.0	19.8	33.1	21.0	-	29.3	20.4
Potatoes	1.7	6.5	1.6	7.2	0.5	0.2	2.9	3.0
Feeding Roots	7.6	31.0	10.2	11.7	16.9	1.5	14.0	14.8
Silage	16.2	12.7	13.6	23.2	35.5	16.0	4.0	16.7
Hay	12.5	28.3	12.4	18.0	22.3	-	12.6	17.0
Other grass	45.3	114.6	83.7	83.7	91.0	22.2	43.4	77.2
Adjusted rough grazing	2.9	6.9	4.9	0.6	8.1	-	0.4	4.4
Total Farm Acreage	144.5	325.0	181.2	208.4	255.9	48.9	145.0	206.6

APPENDIX I

Table (11)

Percentage Distribution of Cropping, 1967

	Type of Sheep Production							
	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Ewe Flock Enterprises	Other Flocks	Purchased Lambs Only	All Farms
Number of Farms	14	12	17	5	8	1	6	63
<u>Crop</u>	%	%	%	%	%	%	%	%
Wheat	2.1	0.9	0.9	0.9	1.8	-	-	1.2
Barley	27.9	31.8	18.4	13.9	21.9	18.4	26.5	24.5
Oats	10.3	5.8	11.0	15.9	8.2	-	20.2	9.9
Potatoes	1.2	2.0	0.9	3.5	0.2	0.4	2.0	1.5
Feeding Roots	5.3	9.5	5.6	5.6	6.6	3.1	9.6	7.2
Silage	11.2	3.9	7.5	11.1	13.9	32.7	2.8	8.1
Hay	8.7	8.7	6.8	8.6	8.7	-	8.6	8.2
Other Grass	31.3	35.3	46.2	40.2	35.6	45.4	30.0	37.3
Adjusted rough grazing	2.0	2.1	2.7	0.3	3.1	-	0.3	2.1
Total Farm Acreage	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

APPENDIX I

Table (iii)

Livestock Numbers Per Farm, 1966/67

	Type of Sheep Production							
	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Lamb	Other Ewe Flock Enterprises	Other Flocks	Purchased Lambs Only	All Farms
Number of Farms	14	12	17	5	8	1	6	63
<u>Cattle</u>	No.	No.	No.	No.	No.	No.	No.	No.
Bulls	-	0.5	1.8	-	1.0	-	0.2	0.7
Dairy Cows	1.2	2.0	0.6	1.0	29.4	3.0	0.8	4.8
Beef Cows	7.9	15.4	10.8	2.4	5.1	-	5.5	9.0
<u>Other Cattle</u>								
Under 1 year	25.4	51.3	27.6	31.0	24.3	13.0	12.7	29.8
1-2 years	32.1	62.2	32.5	46.4	46.4	4.0	44.5	41.6
Over 2 years	8.4	2.2	8.2	10.0	22.8	-	5.6	8.7
Total Cattle	75.0	133.6	81.5	90.8	129.0	20.0	69.3	94.6
<u>Sheep</u>								
Rams	1.6	4.3	3.1	2.6	2.6	-	0.2	2.6
Ewes	50.1	108.7	117.1	91.8	85.9	3.0	0.3	81.7
Other Sheep	41.9	152.2	83.8	34.8	154.9	33.0	97.8	93.0
Total Sheep	93.6	265.2	204.0	129.2	243.4	36.0	98.3	177.3
<u>Pigs</u>								
Sows	5.6	12.1	2.4	0.8	8.3	-	0.2	5.3
Other Pigs	21.5	142.3	23.8	6.0	42.0	-	8.6	45.0
Total Pigs	27.1	154.4	26.2	6.8	50.3	-	8.8	50.3
<u>Poultry</u>								
Layers	177.5	374.7	157.9	256.0	175.4	75.0	185.3	213.7
Other	25.5	33.3	46.9	-	5.0	-	15.0	26.7
Total Poultry	203.0	408.0	204.8	256.0	180.4	75.0	200.3	240.4

APPENDIX I

Table (iv)

Breed Crosses Used in Ewe Flocks by Number of Farms

1966/67

Breed of Ram and Breed of Ewe		Activity	Early Fat Lamb	Late Fat Lamb	Store Lamb	Breeding Flock	Other Female Flock Enterprises	All Groups
			No. of Farms	No. of Farms	No. of Farms	No. of Farms	No. of Farms	No. of Farms
Border Leicester	x	Blackface	1	2	5	-	1	9
Blackface	x	Blackface	-	1	1	-	1	3
Suffolk	x	Blackface	-	-	-	-	1	1
Border Leicester	x	North Country Cheviot	-	1	2	5	-	8
Suffolk	x	North Country Cheviot	4	1	1	-	1	7
Suffolk	x	Greyface	4	6	2	-	1	13
Suffolk	x	Half-bred	9	4	10	-	1	24
Suffolk	x	Suffolk Cross	-	-	1	-	1	2
Border Leicester	x	Border Leicester	-	-	-	-	1	1
Oxford	x	Half-bred	1	-	-	-	-	1
Dorset Horn	x	Half-bred	-	-	1	-	-	1
Oxford	x	Greyface	-	-	1	-	-	1
Oxford	x	Oxford	2	-	-	-	1	3
Oxford	x	Dorset Horn	1	-	-	-	-	1
Suffolk	x	Suffolk	-	-	-	-	1	1
Oxford	x	Suffolk Cross	1	-	-	-	1	2
Totals			23	15	24	5	11	78

APPENDIX I

Table (v)

Number of Ewes in Survey by Breeds, 1966/67
(Tupped Autumn 1966 or at October 1st, 1966)

Breed of Ewe	Activity		Early Fat Lamb		Late Fat Lamb		Store Lamb		Breeding Lamb		Other Ewe Flock Enterprises		All Groups	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Blackface	41	5.6	93	6.2	519	28.4	-	-	299	21.3	952	16.2		
N.C. Cheviot	224	30.6	56	3.8	245	13.4	442	100	131	9.3	1,098	18.6		
Grayface	108	14.7	912	61.2	358	19.6	-	-	270	19.2	1,648	28.0		
Half-bred	342	46.8	423	28.4	704	38.6	-	-	615	43.9	2,084	35.4		
Border	-	-	-	-	-	-	-	-	32	2.3	32	0.5		
Leicester	-	-	-	-	-	-	-	-	-	-	-	-		
Suffolk or	1	-	6	0.4	-	-	-	-	42	3.0	49	0.8		
Suffolk Cross	-	-	-	-	-	-	-	-	-	-	-	-		
Oxford and Crosses	17	2.3	-	-	-	-	-	-	14	1.0	31	0.5		
Totals	733	100.0	1,490	100.0	1,826	100.0	442	100.0	1,403	100.0	5,894	100.0		

Table (vi)

Number of Rams in Survey by Breeds
(At tupping 1966)

Breed of Ram	Activity		Early Fat Lamb		Late Fat Lamb		Store Lamb		Breeding Lamb		Other Breeding Enterprises		All Groups	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Blackface	-	-	1	2.0	1	1.4	-	-	1	4.8	3	1.6		
Cheviot	-	-	-	-	-	-	-	-	-	-	-	-		
Border	-	-	-	-	-	-	-	-	-	-	-	-		
Leicester	2	7.1	5	10.2	34	49.3	15	100	10	47.6	66	36.3		
Suffolk	25	89.3	43	87.8	32	46.3	-	-	8	38.1	108	59.4		
Dorset Horn	-	-	-	-	1	1.5	-	-	-	-	1	0.5		
Oxford	1	3.6	-	-	1	1.5	-	-	2	9.5	4	2.2		
Totals	28	100.0	49	100.0	69	100.0	15	100	21	100.0	182	100.0		

APPENDIX II

Statistical Coefficients

For some of the tables in the text, statistical coefficients have been calculated and are set out below.

The Correlation Coefficient r , which must lie between 1 and -1 indicates the degree of relationship between two variables. Figures of +1 or -1 would indicate a perfect relationship between the variables. 0 would indicate no relationship at all. Intermediate values indicate a trend.

The Standard Error S.E., is used to indicate the magnitude of sampling error in a set of observations, and is directly related to the number of observations in the sample and the dispersion of the original values.

Table Number	Title of Table	Variable or Variables	Statistical Coefficient
10	Relationship of Net Farm Income per Acre to Sheep Output as a Percentage of Total Gross Output, 1966/67	Net Farm Income per Acre to Sheep Output as a Percentage of Total Gross Output	$r = -0.372$ (Sig P = .01)
12	Average Output, Variable Costs and Gross Margin per ewe by system of Production, 1965/66	Gross Margin per Ewe	Early Fat Lamb Mean £5.3 SE0.9 Late Fat Lamb Mean £4.6 SE0.5 Store Lamb Mean £4.7 SE0.5 Breeding Lamb Mean £4.9 SE1.3 Other Flocks Mean £5.6 SE1.8
13	Average Output, Variable Costs and Gross Margin per ewe by System of Production, 1966/67	Gross Margin per Ewe	Early Fat Lamb Mean £8.3 SE0.5 Late Fat Lamb Mean £6.5 SE0.4 Store Lamb Mean £6.7 SE0.4 Breeding Lamb Mean £6.6 SE0.8 Other Flocks Mean £5.3 SE1.3
14	Average Gross Margin and Carrying Capacity per Acre by System of Production, 1965/66	Gross Margin per Acre	Early Fat Lamb Mean £13.4 SE2.7 Late Fat Lamb Mean £10.9 SE1.1 Store Lamb Mean £13.8 SE1.6 Breeding Lamb Mean £12.7 SE3.9 Other Flocks Mean £19.5 SE3.9
15	Average Gross Margin and Carrying Capacity per Acre by System of Production, 1966/67	Gross Margin per Acre	Early Fat Lamb Mean £18.4 SE2.3 Late Fat Lamb Mean £14.6 SE1.1 Store Lamb Mean £17.8 SE1.4 Breeding Lamb Mean £14.0 SE1.6 Other Flocks Mean £16.5 SE3.6
20	Average Gross Margin, Fixed Costs and Profit or Loss per Forage Acre, 1965/66	Profit per Acre	Early Fat Lamb Mean (-) £2.2 SE2.1 Late Fat Lamb Mean (-) £2.8 SE1.1 Store Lamb Mean (-) £1.9 SE2.8 Breeding Lamb Mean £0.3 SE4.2 Other Flocks Mean £5.2 SE7.2

Table Number	Title of Table	Variable or Variables	Statistical Coefficient
21	Average Gross Margin, Fixed Costs and Profit or Loss per Forage Acre, 1966/67	Profit per Acre	Early Fat Lamb Mean £3.5 SE2.6 Late Fat Lamb Mean £0.8 SE1.3 Store Lamb Mean £2.3 SE2.1 Breeding Lamb Mean £2.8 SE1.5 Other Flocks Mean £2.4 SE4.0
22	Average Lambing Percentage per Flock by System of Production, 1966/67	Lambing Percentage	Early Fat Lamb Mean 160 SE6 Late Fat Lamb Mean 147 SE8 Store Lamb Mean 138 SE7 Breeding Lamb Mean 160 SE10 Other Flocks Mean 119 SE14
24	Relationship of Gross Margins to Lambing Percentage, 1966/67	Gross Margin per Ewe to Lambing Percentage	$r = +0.41$ (Sig P = .01)
24	Relationship of Gross Margins to Lambing Percentage, 1966/67	Gross Margin per Acre to Lambing Percentage	$r = +0.13$ (N.S.)
27	Lambing Percentages According to Breed of Ewe, 1966/67	Lambing Percentage	Blackface Mean 132 SE9 North Country Cheviot Mean 142 SE10 Greyface Mean 161 SE2 Half-bred Mean 173 SE6
37	Relationship of Stocking Rates and Gross Margins, 1966/67	Stocking Rates and Gross Margins per Acre	$r = +0.35$ (Sig. P = .01)
57	Average Output, Variable Costs and Gross Margin per Lamb for Autumn and Winter Fattened Sheep, 1966/67	Gross Margin per Lamb	Off grass before 1/1/67 Off Grass after 31/12/66 Mean £0.6 SE0.2 Roots after 31/12/66 Mean £0.7 SE0.2 Mean £1.4 SE0.2

Table Number	Title of Table	Variable or Variables	Statistical Coefficient
58	Average Output, Variable Costs and Gross Margin per Lamb for Autumn and Winter Fattened Sheep, 1966/67 (All lambs purchased)	Gross Margin per lamb	Mean £2.0 SE0.4
62	Average Output, Variable Costs, Gross Margin and Profit per lamb for Autumn and Winter Fattened Sheep, 1966/67	Profit per lamb	Off grass before 1/1/67 Mean £0.2 SE0.2 Off grass after 31/12/66 Mean £0.0 SE0.3 Roots after 31/12/66 Mean -£0.3 SE0.3
63	Average Output, Variable Costs, Gross Margin, Fixed Costs and Profit per Lamb for Autumn and Winter Fattened Sheep, 1966/67 (All purchased)	Profit per lamb	Mean £0.1 SE0.4

APPENDIX III

Accounting Methods and Definitions

Method of Deriving Information

Information was obtained from farmers by the survey method. No detailed records were required to be kept by farmers who were, however, asked to keep a note of utilisation of grazing. Details of sales and purchases were obtained from vouchers and invoices, which were supplemented by accounts available in the Financial Accounts Scheme.

Accounting Year

The sheep year was taken as falling between 1st October and 30th September.

Average Figures

Where average figures are detailed in tables, these refer to per flock averages, unless specified otherwise.

Gross Margin

The gross margin for the sheep enterprise is the difference between output and variable costs. The gross margin per ewe for each flock was calculated by dividing the total gross margin by the number of ewes tupped. For non-breeding flocks the gross margin per head was calculated by dividing the total gross margin by the number on hand at the beginning plus the number purchased. The gross margin per forage acre was calculated by dividing the total gross margin by the number of forage acres used in the year.

Output

The output of the sheep enterprise is the sum of the closing valuation of sheep and receipts from the sales of lambs, ewes, rams and wool and subsidies, minus the sum of the opening valuation and purchases of sheep.

Sale Prices

Sale prices for sheep appearing in this report include guarantee payments where applicable. Sale prices are net of market commission and insurance charges.

Valuations

Valuations of sheep were based on the estimated market value at the time of valuation. Where sheep were bought immediately prior to or sold soon after this date, these sheep were valued at the price paid or received.

Variable Costs

Variable costs are usually defined as those costs which can be both readily allocated to a specific enterprise and which will vary according to changes in the scale of that enterprise. In this study the variable costs have been designated as purchased foods, the variable costs of home-grown foods, including grazing, veterinary and medicines, casual labour and carriage.

Throughout the report, all receipts and costs are taken to the nearest 6d.

Foods

Purchased supplements were charged at actual cost delivered to the farm. Home-grown cereals were valued at market values, using values of grain sold from the farm as a basis. Where no grain was sold a value of £1 per cwt for oats and barley was assigned.

For hay and silage, the total variable cost is made up of a share of the cost of seed, lime and slag, the cost of fertiliser and where applicable, materials and contract work. Half of the costs of seed and fertiliser so allocated were debited to the hay and silage in the case of once cut crops and half to grazing. In the case of twice cut crops, three quarters of those costs were debited to the conserved crop and one quarter to grazing.

The variable costs of roots included the cost of seed, fertiliser, a share of lime and slag costs and, where applicable, casual labour. Accurate estimates of root yields are difficult and the costs are based on a yield of 20 tons per acre.

The variable costs of grazing were made up of fertiliser costs and a share of seed, lime and slag costs. Of the total variable costs for grazing and aftermaths, four-fifths were allocated to the spring and summer months (April 1st to September 30th) and one fifth to the autumn

and winter months (October 1st to March 31st).

Where mixed grazing of cattle and sheep was practised, the grazing was allocated on a proportionate basis according to the length of time occupied by each class of stock and on a livestock unit basis, using the following standard livestock units as agreed by the Scottish Conference of Agricultural Economists.

Bulls	1
Dairy Cows	$1\frac{1}{4}$
Beef Cows	1
Cattle - under 1 year	$\frac{3}{8}$
- 1-2 yrs.	$\frac{2}{3}$
- over 2 yrs.	1
Ewes	$\frac{1}{5}$
Rams	$\frac{1}{4}$
Lambs under 6 mth.	$\frac{1}{16}$
" over 6 mth.	$\frac{1}{10}$

Forage Acres

Forage acres are the acres of forage crops - grazing and after-maths, hay, silage and roots - used by the sheep and adjusted in accordance with the factors detailed above. Cereals fed are not regarded as forage acres.

Carrying Capacity

Carrying capacity per acre was calculated by dividing the average number of ewes on hand over the period by the number of acres used in that period.

Fixed Costs

The fixed costs shown in this report consist of labour and tractor costs, rental and overheads. The labour was calculated using figures given by the farmer for direct work on the sheep enterprise and using typical figures for establishment, cultivation and harvesting of the forage crops. Labour was charged at 6s. 7d. per hour in 1965/66 and 6s. 11d. per hour in 1966/67.

Tractor hours directly associated with the sheep were obtained from the farmer and, for establishment, cultivation and harvesting of crops, typical hourly figures per acre were used. Tractors are costed at 4s. 6d. per hour in 1965/66 and 4s. 9d. per hour in 1966/67.

Overheads, i. e. an appropriate share of general farm expenses were calculated as follows:-

	<u>1965/66</u>	<u>1966/67</u>
Per £ direct man labour	-: 8: 3	-: 8: 9
Per Tractor Hour	-: 6: 6	-: 6: 6
Per Acre	-:10: 9	-:10: 9
Per Livestock Unit Year	1:12: 3	1:12: 3

Rent was charged at its actual level for tenanted farms and in the case of owner occupied farms at a level similar to that charged for tenanted farms elsewhere in the district.

Gimmers and Ewe Lambs

In this report the term gimmer is used to describe shearling ewes, that is ewes which will be approximately eighteen months old at tupping. The term ewe lamb is used to describe females approximately one year younger.