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Sheep -
Cost of
production



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DEPARTMENT OF AGRICULTURAL ECONOMICS

REPORT ON SHEEP COSTS INVESTIGATIONS 1948-1950
(WITH COMPARATIVE DATA FOR EARLIER YEARS).

by

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AGRICULTURAL RESEARCH BUILDING, PENGLAIS, ABERYSTWYTH

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December, 1950.

J. Pryse Howell.

REPORT ON SHEEP COSTS INVESTIGATIONS 1948-1950
(WITH COMPARATIVE DATA FOR EARLIER YEARS.)

General Observations.

The sheep population of all Welsh counties increased appreciably between 1948 and 1949, and according to the June census the total for Wales rose by nearly 360 thousand during that period. It is particularly interesting to note that significant increases occurred in such typical lowland counties as Carmarthen and Anglesey.

Continuous attempts have been made to rebuild Welsh flocks after the losses of 1947, and progress has been satisfactory in most areas. Perhaps the changes in the breeding ewe population at the December censuses offer the best guidance in assessing this progress. Table I shows the relative changes since 1946 for two groups of counties.

Table 1.

Ewes for Breeding - December figures.
December 1946 = 100.

	1947.	1948.	1949.
<u>Group 1 'Hill Sheep' Counties.</u>			
Brecon, Caernarvon, } Merioneth, Montgomery } Radnor }	73.1	75.5	81.6
<u>Group 2 'Lowland' Counties.</u>			
Anglesey, Carmarthen, Flint, } Monmouth, Pembroke }	83.6	86.5	90.3

There has also been a marked increase in the number of sheep and lambs purchased by the Ministry of Food collecting centres in Wales. Admittedly numbers available in 1947 were abnormally low as a result of the havoc wrought by the storm in that year. Nevertheless, it is significant that in 1949 nearly 40 per cent more head of sheep were purchased through Welsh collecting centres than in 1947. Details for individual counties are shown in Table A1. For the United Kingdom as a whole the home supply of mutton and lamb (by weight) was nearly 20 per cent higher than in 1947; net imports, however, had fallen by 15 per cent. (1)

There appears to have been some changes in the pattern of deliveries to collecting centres in the post-war period, which may have been influenced by

(1) Commonwealth Economic Committee Report. MEAT, 1950.

external factors. If the official statistics of purchases by the Ministry of Food from 1944 to the present time are examined, it will be seen that purchases in the third and last quarter of the year have increased while those in the first two quarters have decreased considerably. (Table A2). The season of heavy deliveries, of course, coincides with that of the lowest seasonal prices. It might be that the price differential is not sufficient to bring in more supplies during the first two quarters of the year. On the other hand, there are certain periods of the year on lowland farms when the presence of sheep is not welcomed. There is also reason to believe that a greater proportion of supplies are derived from hill flocks, whose lambs are not ready for slaughter until the autumn.

Some adjustments have been made in the agricultural price structure recently, indicating greater emphasis on domestic meat products. The guaranteed minima for the next four years have just been announced and it is interesting to compare their courses for the different livestock products. Prices have been fixed for 1950-51 and guaranteed minima have been declared up to 1953-54. If we take the existing averages of fixed prices in 1949-50 as the basis, the relative proposed changes are as indicated in Table 2.

Table 2.

Fixed and Guaranteed Minimum Meat & Milk Prices.
(1949-50 = 100).

	Fixed Prices.		Guaranteed Minima.			
	1949-50	1950-51	1951-52	1952-53	1953-54	
Milk	100	103	81	74	68	
Fat Cattle	100	102	90	92½	92½	
Fat Sheep	100	102	85	85	85	
Fat Pigs	100	109	70	93½	93½	

The guaranteed minimum prices will not necessarily be the ruling prices in the years 1951 to 1954. There may be different trends in 'premium' or 'quality' prices within the general price proposals, showing not only a product emphasis but also a quality emphasis. The greatest relative emphasis in the new proposals is on pigs and fat cattle, and the least on milk. With sheep production in 1953-4 having a guarantee of 15 per cent below the existing average price, compared with a 32 per cent drop in the case of milk, some readjustment to dairy-sheep organisation may be instigated.

One feature of lamb sales throughout the country this autumn (1950) is the increase in prices of cross-bred lambs. In one particular case in Scotland lambs from half-bred ewes, and other cross-bred lambs, have averaged 25s. a head more than in the corresponding sale last year. Blackface ewe lambs

at the Peebles Sales, however, realised 4s.10d. per head less, and wether lambs 2s.9d. per head less, than in 1949.

Sharp increases in costs of feedingstuffs and labour have made relatively light impact on the sheep industry. Mild, open winters have also helped by necessitating less recourse to handfeeding of grassland flocks. Hill sheep farming, of course, has its special problems, arising mainly out of the capacity of pastures and, hence, of the product of those pastures. Moreover, many hill farmers have to find wintering accommodation for part of their flocks, and while the assistance they have had from the Hill Sheep Subsidy Scheme is being reduced they have had to face increasing costs of wintering sheep away from the farms. Average figures for 20 farms in North Wales show an increase of from 17s.6d. to 19s.6d. per head for the last two winters 1948-9 and 1949-50. The lowest flock average in 1948-9 was 12s; in 1949-50 it was 13s. The corresponding highest flock averages were 21s.6d. and 25s., and in one particular case part of the flock was wintered at a cost of 30s. per head.

This year has been a significant milestone in the history of sheep farming in this country, because it has seen the introduction of wool into the list of Price Review Commodities, and also the initiation of a Wool Marketing Scheme. Recent information indicates that foreign wool sales show spectacular booms; at the recent auction sales in the great wool-producing countries record prices have been obtained; a price of 152½d. per pound was quoted for super-fine quality combings in South Africa, while in Australia 187¾d. per lb. was realised in the auctions at Sydney this year. The British Wool Marketing Scheme had a 75 per cent initial registration of producers and 94 per cent of these have voted in favour of the proposals. This indicates a satisfactory support for the scheme, which should help to bring increased prosperity to our home sheep industry. It provides for a guaranteed fixed price each year and for a long-term guarantee of minimum prices, besides a share in the profits of each clip to producers.

Results with Costs Enquiries.

Investigations into the costs of sheep enterprises in Wales have been continued, and this report attempts to present the latest information from these surveys and to show comparative data for the last few years.

(a) Hill Sheep.

The enquiry into hill sheep costs and returns covers the period 1st November to 31st October. For the years 1945-6 to 1947-8 information is available in previous reports published by the Department of Agricultural Economics*. During the year 1948-9 conditions were generally favourable for

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- * (a) Hill Sheep - A Study of Costs and Returns on 48 Welsh Farms during 1945-6. 1948.
 (b) Sheep Production - A Survey of Present Conditions and Some Financial Results with Welsh Flocks. 1949.

hill sheep farming, and the process of rebuilding flock numbers progressed satisfactorily.

Details were obtained for 44 Welsh flocks distributed throughout Brecon, Caernarvon, Denbigh, Merioneth and Montgomery. The aggregate margin shown in Table B1* is the result of proceeds from sales of sheep and wool, plus receipts from the Hill Sheep Subsidy Scheme and increase in valuation. In interpreting this margin it is important to realise that £9,205 increase in valuation largely represents attempts at rebuilding breeding stocks of sheep. If the subsidy and this valuation increase are not included, the margin is reduced to a very small proportion - roughly £380 per farm or £80 per breeding unit of 100 ewes (excluding gimmers and other sheep). From this sum general farm overhead charges and interest on capital, not included in the costs, have to be met.

Comparative results for the four years of the survey are shown in Table B2. These are results for all farms in the separate samples, and are expressed in terms of per unit of 100 breeding ewes. Although income from sales of sheep and wool in 1948-9 increased appreciably as compared with the previous year, there was more than a corresponding increase in costs and there was also a fall in subsidy receipts; the net result was a decrease in margin of £32 per hundred ewes. Similar trends are noticeable when comparative results for 30 identical flocks are examined (Table B3). The net result for these 30 farms over the whole four years of the investigation is an aggregate margin of nearly £45,000, or £374 per farm per annum. Over the whole period £40,000 was received in hill sheep subsidy payments by these farms; if this were excluded the margin per farm would be reduced to about £40 per annum.

Apart from the price factor, the effective lambing ratio is probably the main influence upon ^{general} financial results. It determines the number of sheep that will be available for sale from each flock. A high ratio in the last two years has not only improved the level of income from, but has also helped considerably to re-establish normal sizes in, breeding flocks. The following figures indicate the comparative position for the four years of this investigation; they are expressed in terms of per hundred ewes for lambing in each year (excluding shearling ewes):-

Table 3.

Numbers of Sheep Sold per 100 Ewes for Breeding.

	1945-6.	1946-7.	1947-8.	1948-9.
Ewes & Rams	19	6	17	22
Wethers	6	4	7	7
Lambs	21	7	26	36
Total	46	17	50	65

* Tables relating to the Hill Sheep Survey appear in Appendix B.

The relative high figures for 1948-9 are no doubt due to the abnormally high percentage of the lamb crop in the flocks concerned. For the 44 flocks the average crop of lambs, as far as could be ascertained, was 90 per cent. The total number of home-bred lambs available for disposal - i.e. for flock replacement, for sale, and on hand at the end of the year - represented about 85 per cent of the total number of ewes prepared for lambing in the previous autumn.

The remarkable progress in re-building flocks after the 1947 disaster probably had the effect of steadying prices in 1949, particularly in the case of draft ewes. Relative prices can be influenced by variations in the condition or quality of sheep in different years on the same farms. For farms in this investigation the average prices realised for different classes of sheep were:-

Table 4.

Prices per head.

Class of Sheep.	1945-6.	1946-7.	1947-8.	1948-9.
	s. d	s. d	s. d	s. d
Fat Lambs	42. 9	48. 10	62. 4	66. 3
Other Lambs	24. 4	39. 4	52. 8	51. 1
Fat Wethers	58. 9	65. 8	85. 8	95. 4
Other Wethers	48. 1	52. 1	80. 9	81. 4
Rams & Ram Lambs	67. 3	116. 8	223. 0	186. 3
Fat Ewes	35. 0	38. 8	45. 0	53. 5
Other Ewes	34. 11	56. 0	68. 7	62. 3

In the 30 flocks, from which information has been available over four years, the total aggregate number of lambs for disposal was 38,572. During the period 844 lambs were bought in; if we assume that 5 per cent of these were lost, we can estimate the total product of home-bred lambs from these 30 flocks over the whole period as being roughly 37,770 lambs, or an average of 9,440 per annum. The size of the breeding flock at the commencement of the period was 19,780 ewes (excluding shearlings). For the four years, therefore, the average annual product of lambs, in terms of per 100 breeding ewes at the initial date, was 48; this compares with an average of 66 for the initial year 1945-6 (for the same group of farms). The low average for the whole period was largely due to the heavy losses in 1947.

With the higher lambing ratio in 1949, more lambs were available for sale, and a smaller proportion was retained for flock replacement than was the case in the previous year. Comparative data are shown in Table 5.

Table 5.

Disposal of Lamb Crop (as percentages),
(Including losses).

	1945-6.	1946-7.	1947-8.	1948-9.
	%.	%.	%.	%.
Kept for Ewe Flock Replacement:	46.4	23.0	46.2	42.9
Kept for Ram " "	1.5	1.5	2.2	1.8
Kept for Wether " "	15.9	9.8	11.1	11.2
Sold as Fat Lambs	7.4	7.0	7.9	14.5
Sold as Store or Breeding Lambs (inc. Lambs not sold)	23.5	8.6	27.5	25.5
Losses during the year	5.3	50.1	5.1	4.1
	100.0	100.0	100.0	100.0

Table 5 does not relate to an identical group of farms, although the 30 identical farms form a large proportion of the total in each year. Nevertheless, the increase in the proportion of lambs graded as fat in 1948-9 may be regarded as a feature in the trends of the lamb disposals. Factors accounting for this may vary from farm to farm; in some cases provision for folded crops like rape would account for it; in others, the farmer has taken to the practice of crossing cast ewes with a lowland breed ram to produce lambs of higher fattening capacity; while in the last two years weather conditions have provided more pasturage in late autumn than is ordinarily available.

It was possible, in the flocks surveyed, to reduce slightly from the previous year's average the ratio of replacement of ewes. For each 100 ewes available for breeding at the end of the investigation year, the relative numbers of ewe lambs retained for breeding were:-

1945-6	-	32
1946-7	-	16
1947-8	-	38
1948-9	-	35

The average death-rate in ewes for the 44 flocks in 1948-9 was 3.4 per cent; this must be regarded as an unusual record for hill flocks. On some farms the losses in ewes were negligible, and the worst case encountered was one where 13½ per cent of the ewes were lost. Unfortunately, it was not possible to diagnose the causes of loss in the latter case. Hill farmers are indulging increasingly in precautions against illness and disease in sheep. The sharp increase noticeable in the item 'other expenses' in the sheep account (see

Table B3) reflects the increasing use of capsules, sera, powders &c. and partly also the rise in the price of these materials.

(b) Lowland Sheep.

During 1948-9 and 1949-50 the Department obtained data from two groups of farms engaged in fat lamb production in lowland areas in Wales. Information relating to the lamb crops of 1945 to 1947 has already appeared in previous publications*, and this report will be mainly concerned with results for the 1948 and 1949 lamb crops in the flocks investigated.

Group A.

These farms not only rear lambs of their own breeding, but also buy in an appreciable number. This practice raises a problem in the presentation of costs. The costs as collected, relate to the whole sheep enterprise on the farms. In view of this difficulty, and in order to get some standard for comparing results in various years, Table C1**, showing general results of the sheep enterprise on the different groups of farms, is presented in terms of 'per 100 lambs handled'. While costs have been increasing, income from sales of sheep and wool has risen at least commensurately. Although the groups in the total sample each year are not quite identical, they are similar enough to warrant a comparative examination of prices in the five years of the survey (Table C5). The bulk of the flock income is derived from the sale of fat lambs, and it will be seen that prices realised per lamb increased by 50 per cent (although the average weight was less in 1949-50 than in 1945-6). Prices realised for breeding stock sold have also increased in similar proportions. Table C2 attempts to show changes in costs of production per lamb, and it is necessary to realise that, in the concept of cost as understood in this survey, the result can be influenced by relative changes in prices for breeding stock drafted out from the flocks. Moreover, the flocks, as has been mentioned in previous reports, are on farms mainly engaged in milk production, and follow dairy cattle on the pastures. If abundant pasturage becomes available additional lambs can be purchased; they are expensive to buy but can be kept cheaply. Such factors as this can influence the net results, and with grass-fed sheep we can get reduction in costs while the tendency in various cost items - like labour and materials - is to increase. Between 1945-6 and 1949-50 the gross costs per lamb (for all farms investigated in each year) increased by 33 per cent, while net costs (after allowing for credits).

* (a) "Costs of Fat Lamb Production on Lowland Farms in Wales in 1945-6". B. H. Roberts, Department of Agricultural Economics, University College of Wales, Aberystwyth. 1947.

(b) "Sheep Production - A Survey of Present Conditions and Some Recent Financial Results with Welsh Flocks". B. H. Roberts, Department of Agricultural Economics, University College of Wales, Aberystwyth. 1949.

** Tables relating to farms in Group A appear in Appendix C.

increased by 24 per cent; the corresponding increase in the output value per lamb was 46 per cent. On an identical group of 17 farms the corresponding ratios were 47, 44 and 42 per cent (see Table C4).

Some idea of the trends in the profitability of fat lamb production on Welsh lowland farms may be gathered from Table C3. In arriving at the net result, no allowance has been made for overhead charges on these farms and the margin shown should be regarded as the reward to the farmer to cover these charges and the interest on his capital. More value may perhaps be attached to the indication of trend which this table demonstrates. Expenses on sheep, and income from the sale of sheep and wool, increased in similar proportions if we compare 1945-6 and 1949-50. Comparatively speaking costs of keep have not shown very substantial increases during the period but the cost of labour has increased by nearly 40 per cent. As was the case on the hill sheep farms investigated, substantially more precautions are being taken against disease, and increasing costs of injections and sera etc. are reflected in the item "other expenses".

In the last two years there appears to have been a tendency for a greater proportion of the lambs to be offered on the store market. There was a sharp increase in prices offered for store lambs between 1947-8 and 1948-9 (see Table C5) which may have accounted for this. Table 6 shows an analysis of the lamb disposals in each year.

Table 6.

Analysis of Lamb Disposals in Each Year.

	1945-6	1946-7	1947-8	1948-9	1949-50
	%.	%.	%.	%.	%.
Sold as Fat Lambs	79.9	78.9	69.3	67.9	70.9
Sold as Store Lambs	6.9	3.7	10.1	14.2	11.3
Sold for Further Breeding	0.9	2.1	2.4	2.9	3.0
Kept for Flock Replacement	4.4	8.6	10.2	10.4	8.0
On Hand Unsold	7.9	6.7	8.0	4.6	6.8
	100.0	100.0	100.0	100.0	100.0

Group B.

In 1948 the investigation was extended to another group of farms in the rearing counties of Brecon, Radnor, Denbigh and Anglesey. On the whole, the farms are larger than those in Group A and although a number are engaged in milk production they are more in the nature of stock-raising farms. The average size of the 27 farms included in the sample for the two years was about 250 acres, and the average stock complement, other than sheep, consisted of 21 dairy cattle (for liquid milk or suckling calves), 57 other cattle and calves, 3 pigs and 150 head of poultry.

On ten of the farms milk was regarded as first or second most important saleable commodity; sheep was the most important product on 13 of them, and the second in importance on 12. Fat and store cattle were the other main products. Three of the farms had no breeding flock of ewes; on the rest the average size of the ewe flock was 175 per farm, varying from 50 to 308. The farms without breeding flocks bought in lambs for fattening during the winter; they were primarily engaged in milk production and sheep were acquired mainly for maintaining fertility. Where breeding flocks were kept, cross-breeding was practised in more than half of the cases; the rams used were mainly Kerry Hill, Clun, Suffolk and Wiltshire. In eight of the flocks Welsh ewes were used, crossed either with Wiltshire or Suffolk rams.

As was the case with the other group, a substantial proportion of the lambs handled were purchased.

On 29 farms included in the first year of the survey, the average provision of folded crops per farm consisted of about $5\frac{1}{2}$ acres of rape together with about 4 acres of other roots, mainly turnips and swedes. There was considerably more hand-feeding, and a greater provision of root and folded crops on these farms than was the case on the farms belonging to Group A.

Tables relating to the results of this group of farms appear in Appendix D at the end of this report. The extra feeding, and the use of heavier breeds generally, produced bigger sheep than was the case with Group A. Compared with the latter, expenses and income, in terms of per hundred lambs, were substantially higher, although the margin was somewhat lower (see Table D1).

Comparative results as between the two groups, and even within each group, were influenced by the relative extent of lamb purchases. The proportion (percentage) of lambs purchased to total lambs handled in each year for the two groups were as follows:-

<u>Group.</u>	<u>1948-9.</u>	<u>1949-50.</u>
A	$19\frac{1}{2}$	20
B	29	$21\frac{1}{2}$

It is significant that a reduction in purchases of lambs in Group B coincided with a reduction of expenses and increase in revenue; this has given a better margin in terms of per lamb handled. Heavier purchases might have increased the output value per lamb, but the corresponding increase in expenses of purchasing might have more than offset it.

The concept of cost used is identical with that in Group A. This means that the net result - or the net cost per lamb produced - is influenced by the trading results of breeding flocks. As Table D5 will show, ewes sold realised 5s. per head more in 1949-50 than in 1948-9. Another feature of flock organisation in these farms is that only half the draft of ewes are replaced

from their own breeders, and in fact in the two years of this survey more ewes have been purchased than have been brought in from their own stock for breeding. There is therefore a fairly rapid turnover of breeding ewes, with a consequent tendency for a reduction of flock depreciation cost.

The results for an identical group of 25 farms (see Tables D3 and D4) show similar changes to those for the whole sample in each year, except that the reduction in cost of purchases of lambs is not quite so much for the identical group. One notable feature of the change is the increased revenue from sale of wool; for the identical group of 25 farms this increase was nearly £800, or £32 per farm. This, however, was partly due to the fact that the farms on the whole tended to carry rather more sheep in the later year; it will be noticed that 177 more lambs were produced then.

Losses with sheep on the farms in this survey were somewhat less during the 1949-50 investigation year than they were during 1948-9. This applies to both groups. Birth ratios (numbers of lambs born per 100 ewes) also showed a slight improvement. These factors would of course affect comparative results in the two years. The relative figures are given in Table 7.

Table 7.

Birth Ratios and Losses in Ewes and Lambs.

	Group A.		Group B.	
	1948-9	1949-50	1948-9	1949-50
Birth Ratio	130	142	121	124
Percentage Losses in Ewes	6.0	4.0	5.0	4.7
Percentage Losses in Lambs	8.3	7.8	9.1	6.6

As Table D5 shows, lambs realised less per head in the later year of this investigation than in the earlier. To a large extent this was accounted for by lower weights. Although the farms provided a good deal of root crops for lamb fattening, a number were fattened off grass, and conditions of pasture in the late summer of 1949 no doubt had some effect on their ultimate weights, whether graded off grass or cruciferous crops.

Provision of additional root crops and more hand-feeding enabled farmers in Group B to spread out the marketing of fat lambs. Although like those in Group A, they market a larger proportion in November than in any other month, they also keep a larger proportion to market in the first quarter of the year, when the controlled price increases. The average distribution of sales of fat lambs for the two groups in the two years is shown in Table 8.

Table 8.

Sales of Fat Lambs.

Month.	Percentage of Fat Lambs Sold.	
	Group A.	Group B.
January	4.2	13.8
February	0.5	8.9
March	0.9	6.2
April	1.7	5.1
May	5.7	4.5
June	6.2	0.8
July	7.0	8.4
August	10.6	5.3
September	9.7	4.7
October	10.3	8.4
November	24.9	21.5
December	18.3	12.4
	100.0	100.0

Wool.

As has already been indicated, a good deal of attention has currently been focussed on this by-product of the sheep industry. For hill flocks covered by current investigations receipts from sales of wool were roughly 25 per cent of the receipts from sales of sheep; for lowland flocks the corresponding ratio was between 7 and 8 per cent.

It was not possible, in these surveys, to relate the total farm production of wool to certain numbers of sheep. When it was related to the number of ewes at opening valuation dates, however, the averages for hill flocks varied from 2 to 3 pounds per ewe (this would include wool off rams and wethers but not from lambs); for lowland flocks the average was between 4 and 5 pounds (again excluding lamb wool).

It is impossible to forecast how long the present boom in the wool market will last. Lowland flocks are expanding in many parts of the country, and if hill flocks continue to recover their numbers at the rate they have achieved in the last two years, the 1951 clip may well reach the pre-war average. It is estimated that the Treasury had a trading profit of £2 million on the 1949 clip; this would approximate to 8s. or 9s. per head for all sheep qualifying for hill sheep subsidy throughout Great Britain. The trading profit on the 1950 clip will be considerably more, and with the institution of the Wool Marketing Scheme it will fall into the hands of the producers' organisation. The scheme provides, however, that "boom" revenues should be partly used for stabilising future prices, and the existing proposal is for quin-

quennial dividends. The political atmosphere will control future trends of demand and, therefore, of auction prices. The home producer, with his commodity now included in the Annual Price Review list, and his own negotiating agency established, should find much to gratify him. Nevertheless, many flockmasters could improve the presentation of their clip, thus gaining the confidence of the graders and avoiding much controversy and disagreement.

Conclusions.

Although the various cost investigations undertaken do not make allowance for charges of an 'overhead' nature which cannot easily be allocated or the reward for capital investment, current evidence suggests that fat lamb production on grass offers a reasonably good margin of profit. Results from investigations undertaken in Lancashire and Cheshire confirm the findings of similar investigations in Wales, as Table 9 will show*.

Table 9.

Comparative Costs and Returns for Fat Lambs.

	Lamb Crop Year.															
	1947.			1948.			1949.									
	N. West Area (Breeding Wales Group A:Flocks)		Wales Group A:Flocks)	N. West Area (Breeding Wales Group A:Flocks)		Wales Group A:Flocks)	N. West Area (Breeding Wales Group A:Flocks)		Wales Group A:Flocks)							
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.						
Cost per Lamb	49.	4	51.	8	48.	5	64.	9	45.	9	46.	8	54.	6	48.	11
Value " "	86.	7	93.	6	101.	9	107.	5	104.	4	100.	1	101.	7	110.	7
Margin " "	37.	3	41.	10	53.	4	42.	6	58.	7	53.	5	47.	1	61.	8

While we may welcome the return of a sheep flock to many existing Welsh mixed farm units, we may also well heed the advice of one of our well-known agricultural economists. He said that, on a mixed farm, the problem of management is not how to make the maximum profit from the sheep, but how to run a flock so that it will enable the maximum profit to be made from the farm as a whole. Attempts at concentrating too much on sheep at present, in

* Bulletins 45/EC 21, 51/EC 25 and 58/EC 30. University of Manchester, Department of Agricultural Economics.

order, for instance, to cash in on a favourable cost-price relationship, may lead to disaster later on. The sheep's worst enemy is another sheep. Attention has been drawn by animal health experts to problems attending the overcrowding of sheep, and incidence of disease correlates very often with density of stocking. The Ministry of Agriculture has already taken steps towards the setting up of an advisory service for hill sheep farmers. Through the medium of provincial panels this new scheme proposes to tackle, more thoroughly than hitherto, problems of nutrition, breeding, health, and other aspects of husbandry of hill sheep flocks. Increased use of precautions against common ailments in sheep has in any case resulted in a marked decrease in losses from these causes, and it is claimed that new methods and materials used have also considerably reduced the requirements of labour attending to sheep. Close integration of the sheep enterprise into a farm organisation must be compatible with considerations of maintaining health in the flock besides those of the full utilisation of the resources of land and labour in that organisation, for maximum total profit.

APPENDIX A.

Table A1.

Changes in Numbers of Sheep and Lambs Purchased
at Welsh Collecting Centres.

1947 = 100.

County.	:	1948.	:	1949.
Anglesey	:	111.7	:	126.5
Erecon	:	125.7	:	153.0
Caernarvon	:	126.0	:	136.5
Cardigan	:	110.2	:	126.0
Carmarthen	:	114.0	:	127.7
Denbigh	:	125.7	:	138.0
Flint	:	120.8	:	148.3
Glamorgan	:	121.2	:	143.1
Merioneth	:	145.9	:	170.4
Monmouth	:	114.1	:	129.5
Montgomery	:	117.5	:	140.0
Pembroke	:	94.2	:	113.9
Radnor	:	122.4	:	149.4
Wales (inc.	:		:	
Monmouth)	:	119.7	:	138.9

Source: Ministry of Food.

Table A2.

Changes in Purchases of Sheep & Lambs at Collecting Centres (Great Britain). Indices of Weekly Average (Numbers) 1944 = 100.

	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.
1944	100.0	100.0	100.0	100.0
1945	93.9	101.4	98.2	92.7
1946	92.3	92.8	125.2	116.2
1947	69.7	78.4	65.4	95.8
1948	61.3	63.1	102.8	100.1
1949	62.4	76.9	121.1	113.3
1950	63.8	88.7	157.7	-

Source: Monthly Digest of Statistics - Central Statistical Office.

APPENDIX B.

Hill Sheep Survey.

Table B1.

General Statement of Account for 44 Welsh Flocks.
Year November 1948 - October 1949.

	£. s	£. s		£. s
Opening Valuation of Sheep Stock		81,771.12	Sales of Sheep	43,061.19
Purchases of Sheep		4,953. 2	Value of Wool	9,697. 9
<u>Foods:-</u>			Hill Sheep Subsidy	14,781. 0
Hay, Sheep Nuts etc.	203. 4		Closing Valuation of Sheep Stock	90,916. 2
<i>Grazing</i> Rape, Turnips etc.	6,356.19			
Rape, Turnips etc.	801.12			
Agistment	7,981.13	15,343. 8		
Labour on Sheep		10,464. 8		
Transport		665. 4		
Other Costs		4,001.11		
Margin (+)		41,257.16		
		<u>£158,456.10</u>		<u>£158,456.10</u>

Table B2.

Costs & Returns per 100 Ewes for Breeding.*

	1945-46.	1946-47.	1947-48.	1948-49.
Number of Farms	48	39	49	44
Average Size of Ewe Flock per Farm	571	643	447	477
<u>Expenses.</u>	£. s	£. s	£. s	£. s
Purchases of Sheep	1. 18	15. 10	21. 16	23. 12
Foods: Hay, Sheep Nuts etc.	0. 18	7. 13	1. 5	0. 19
Grazing	20. 6	19. 6	27. 14	30. 6
Rape, Turnips, etc.	3. 3	2. 5	2. 13	3. 16
Agistment Costs	18. 6	15. 14	25. 3	38. 0
Labour on Sheep	30. 15	32. 4	42. 1	49. 17
Transport	1. 9	0. 19	1. 18	3. 3
Other Expenses	2. 12	6. 7	17. 2	19. 2
Total Expenses	79. 7	99. 18	139. 12	168. 15
<u>Income.</u>				
Sales of Sheep	80. 11	45. 1	161. 9	205. 2
Value of Wool	21. 15	9. 16	40. 13	46. 4
Hill Sheep Subsidy	37. 0	42. 18	110. 15	70. 8
Total Income	139. 6	97. 15	312. 17	321. 14
Excess Income over Expenditure	59. 19	-	173. 5	152. 19
Excess Expenditure over Income	-	2. 3	-	-
Opening Valn. of Sheep Stocks	295. 16	301. 8	328. 5	389. 10
Closing " " " "	308. 11	180. 14	383. 17	433. 1
Valuation Increase	12. 15	-	55. 12	43. 11
Valuation Decrease	-	120. 14	-	-
Margin (+)	72. 14	-	228. 17	196. 10
" (-)	-	122. 17	-	-

* This relates to numbers of ewes for breeding (excluding shearling ewes) on the sample of farms in each year.

Table B3.

Comparative Results for 30 Flocks.

	1945-46.	1946-47.	1947-48.	1948-49.
Average Size of Ewe Flock at Opening Date	659	667	416	425
<u>Expenses.</u>	£. s	£. s	£. s	£. s
Purchases of Sheep	260.18	3,096.13	1,713.13	1,756.17
Foods: Hay, Sheep Nuts etc.	217.14	1,450.13	239. 1	194.18
Grazing	3,885.15	3,891. 1	3,874.19	4,287.14
Rape, Turnips etc.	603.19	486. 4	475.17	649. 0
Agistment	3,391.16	3,297. 9	2,405.18	3,693. 7
Labour on Sheep	5,533.12	6,391.18	5,753.17	6,616.17
Transport	306.15	201.10	190.17	339.19
Other Expenses	530.17	1,130. 7	1,995. 3	2,334.10
Total Expenses	14,731. 6	19,945.15	16,649. 5	19,873. 2
<u>Income.</u>				
Sales of Sheep	15,550.17	9,028. 2	17,164. 1	23,554.11
Value of Wool	4,167.12	1,996.15	4,859.13	5,568. 1
Hill Sheep Subsidy	7,297. 8	8,722. 8	14,794.13	9,276.10
Total Income	27,015.17	19,747. 5	36,818. 7	38,399. 2
Excess Income over Expenditure	12,284.11	-	20,169. 2	18,526. 0
Excess Expenditure over Income	-	198.10	-	-
Opening Valuation of Sheep Stock	56,793. 6	59,210.11	36,251. 6	44,371. 4
Closing Valuation of Sheep Stock	59,210.11	36,251. 6	44,371. 4	50,944. 9
Valuation Increase	2,417. 5	-	8,119.18	6,573. 5
Valuation Decrease	-	22,959. 5	-	-
Margin (+)	14,701.16	-	28,289. 0	25,099. 5
" (-)	-	23,157.15	-	-

Table B4.

Four Years' Sheep Account for 30 Farms,
November 1945 - October 1949.

	£. s	:		£. s
Opening Valuation of Sheep Stock at 1.11.45	56,793. 6	:	Sales of Sheep	65,297.11
Purchases of Sheep	6,827.19	:	Sales of Wool	16,592. 1
Hand-fed Foods	2,102. 6	:	Receipts of Hill Sheep Subsidy	40,090.18
Grazing Costs	15,939.10	:	Closing Valuation of Sheep Stock at 31.10.49	50,944. 9
Rape, Turnips etc. (folded)	2,215. 1	:		
Agistment Costs	12,788. 9	:		
Labour on Sheep	24,296. 4	:		
Transport Charges	1,039. 0	:		
Other Costs	5,990.17	:		
Margin (+)	44,932. 7	:		
	<u>£172,924.19</u>	:		<u>£172,924.19</u>

APPENDIX C.Lowland Sheep, Group A.Table C1.Costs and Returns per 100 Lambs Handled.

	1945-6	1946-7	1947-8	1948-9	1949-50
Number of Farms	27	34	31	29	25
Total No. of Lambs Produced	2221	2650	2193	2501	2162
<u>Expenses.</u>	£.	£.	£.	£.	£.
Purchases of Sheep	122	106	153	154	182
<u>Foods:-</u> Hand-fed	8	18	5	4	9
Grazing (Pasture)	72	73	67	65	67
Folded Crops	12	13	12	7	11
Labour on Sheep	44	48	51	49	57
Other Expenses	4	8	6	13	14
Total Expenses	262	266	294	292	340
<u>Income.</u>					
Sales of Sheep	357	382	385	492	510
Value of Wool	23	24	20	30	37
Total Income	380	406	405	522	547
Excess Income over Expenses	118	140	111	230	207
Opening Valuation of Sheep Stock	221	270	249	282	285
Closing " " " "	241	250	295	297	324
Valuation Increase	20	-	46	15	39
Valuation Decrease	-	20	-	-	-
Margin (+)	138	120	157	245	246

Table C2.

Costs per Lamb Produced.

	1945-6.	1946-7.	1947-8.	1948-9.	1949-50.
Number of Farms	27	34	31	29	25
Number of Lambs Produced	2224	2650	2193	2501	2162
Average Deadweight per Lamb	42½ lb.	41 lb.	40½ lb.	44 lb.	43 lb.
<u>Costs:-</u>	s. d	s. d	s. d	s. d	s. d
Purchases of Lambs	10. 1	12. 8	20. 3	22. 2	21. 7
Grazing	15. 2	15. 2	16. 3	14. 2	14. 7
Food's (inc. Folded Crops)	4. 2	6. 3	4. 1	2. 5	4. 4
Labour	9. 5	10. 5	12. 6	10. 8	12. 5
Other Expenses	1. 1	1. 7	1. 6	3. 0	3. 0
Net Depreciation on Breeding Flock	2. 0	7. 7	-	2. 7	-
Total Gross Costs	41.11	53. 8	54. 7	55. 0	55.11
<u>Deduct:-</u>					
Value of Wool	4.10	5. 0	4.11	6. 7	8. 1
Net Appreciation of Breeding Flock	-	-	0. 4	-	1. 2
Total Credits	4.10	5. 0	5. 3	6. 7	9. 3
Total Net Costs	37. 1	48. 8	49. 4	48. 5	46. 8
Output Value per Lamb	68. 2	73. 8	86. 7	101. 9	100. 1

Table C3.

Costs and Returns on an Identical Group of
17 Farms. (Actual Totals).

	1945-6.	1946-7.	1947-8.	1948-9.	1949-50.
Total Number of Lambs Produced:	1424	1594	1400	1770	1766
<u>Expenses.</u>	£. s	£. s	£. s	£. s	£. s
Purchases of Sheep	:1644. 19	:2228. 9	:2729. 12	:3839. 4	:4043. 9
<u>Foods:-</u> Hand-fed	:138. 9	:302. 15	:112. 18	:84. 13	:179. 9
Grazing (Pasture)	:1118. 18	:1325. 17	:1206. 4	:1313. 15	:1294. 7
Folded Crops	:133. 16	:89. 9	:95. 12	:125. 15	:132. 17
Labour on Sheep	:724. 10	:772. 19	:857. 17	:859. 5	:1001. 6
Other Expenses	:78. 8	:172. 17	:125. 15	:277. 9	:281. 1
Total Expenses	:3839. 0	:4892. 6	:5127. 18	:6500. 1	:6932. 9
<u>Income.</u>					
Sales of Sheep	:5527. 5	:6343. 13	:6741. 19	:9683. 15	:9810. 9
Value of Wool	:360. 3	:358. 10	:327. 5	:524. 15	:657. 6
Total Income	:5887. 8	:6702. 3	:7069. 4	:10208. 10	:10467. 15
Excess Income over Expenses	:2048. 8	:1809. 17	:1941. 6	:3708. 9	:3535. 6
Opening Valn. of Sheep Stock	:3570. 5	:4024. 3	:4002. 12	:4750. 8	:5285. 3
Closing " " " "	:4024. 3	:4002. 12	:4750. 8	:5285. 3	:6133. 10
Valuation Increase	:453. 18	-	:747. 16	:534. 15	:848. 7
Valuation Decrease	-	:21. 11	-	-	-
Margin (+)	:2502. 6	:1788. 6	:2689. 2	:4243. 4	:4383. 13

Table C4.

Changes in Costs per Lamb Produced on 17 Farms.
(Identical Group).

	1945-6.	1946-7.	1947-8.	1948-9.	1949-50.
Average Deadweight per Lamb (lb.)	43	40	41	44 $\frac{1}{4}$	41 $\frac{3}{4}$
<u>Costs.</u>	s. d	s. d	s. d	s. d	s. d
Purchases of Lambs	7. 6	14. 5	19. 6	27. 2	23. 10
Grazing	15. 9	16. 8	17. 5	14. 10	14. 8
Foods (inc. Folded Crops)	3. 11	4. 11	2. 11	2. 3	3. 7
Labour	10. 2	9. 8	12. 3	9. 8	11. 4
Other Expenses	1. 1	1. 11	1. 10	3. 2	3. 3
Net Depreciation on Breeding Flock	0. 1	7. 0	0. 11	2. 10	-
Total Gross Costs	38. 6	54. 7	54. 10	59. 11	56. 8
Deduct:-					
Value of Wool	5. 1	4. 6	4. 8	5. 11	7. 5
Net Appreciation on: Breeding Flock	-	-	-	-	1. 0
Total Credits	5. 1	4. 6	4. 8	5. 11	8. 5
Total Net Costs	33. 5	50. 1	50. 2	54. 0	48. 3
Output Value per Lamb	68. 6	72. 7	88. 5	102. 0	97. 4

Table C5.

Numbers and Prices of Sheep Sold. (All Farms in
Each Year's Sample).

Class of Sheep.	1945-46.		1946-47.		1947-48.		1948-49.		1949-50.	
	No.	Price	No.	Price	No.	Price	No.	Price	No.	Price
		per head:		per head:		per head:		per head:		per head:
		s. d.		s. d.		s. d.		s. d.		s. d.
Ewes	528	60. 0	702	63. 1	548	84. 0	537	88. 2	526	96. 5
Rams and Ram Lambs	18	87.11	27	97. 9	22	96. 9	25	114.10	17	130. 0
Lambs from Current Year's										
Crop:- Fat	1768	68. 4	1922	74. 3	1393	92. 7	1548	103. 1	1408	103. 1
Store	124	66. 5	34	67.11	81	77. 9	299	95. 6	195	93. 2
Sold for Breeding	23	98. 7	56	72.10	53	81. 9	74	94. 0	63	96. 5
Sold as 'Suckling Lambs'	27	35. 7	51	27.11	109	33. 8	15	35. 4	51	25. 7
Lambs from Previous										
Year's Crop:- Fat	30	78. 7	168	80. 6	127	86. 8	151	119. 7	123	125. 2
Store	3	96. 0	14	45. 0	32	68. 1	40	104. 0	-	-

APPENDIX D.Lowland Sheep - Group B.Table D1.Costs and Returns per 100 Lambs Handled.

	: 1948-49.	: 1949-50.
Number of Farms	: 31	: 27
Total Number of Lambs Produced	: 6130	: 5742
<u>Expenses.</u>	: £. s	: £. s
Purchases of Sheep	: 217. 1	: 174. 12
<u>Foods:</u> Hand-fed	: 32. 2	: 46. 11
Grazing (Pasture)	: 70. 2	: 78. 1
Folded Crops	: 31. 15	: 33. 12
Labour on Sheep	: 52. 8	: 56. 10
Other Expenses	: 22. 13	: 24. 0
<u>Total Expenses</u>	: 426. 1	: 407. 6
<u>Income.</u>		
Sales of Sheep	: 548. 1	: 555. 15
Value of Wool	: 37. 6	: 49. 11
<u>Total Income</u>	: 585. 7	: 605. 6
<u>Excess Income over Expenses</u>	: 159. 6	: 198. 0
Opening Valuation of Sheep Stock	: 366. 3	: 374. 3
Closing " " " "	: 400. 14	: 395. 13
Valuation Increase	: 34. 11	: 21. 10
Valuation Decrease	: -	: -
<u>Margin (+)</u>	: 193. 17	: 219. 10

Table D2.

Costs per Lamb Produced.

	1948-49.	1949-50.
Number of Farms	31	27
Total Number of Lambs Produced	6130	5742
Average Deadweight per Lamb (lb).	47½	43½
<u>Costs:-</u>	s. d	s. d
Purchases of Lambs	29. 5	22. 6
Grazing	15. 5	16. 8
Hand-fed Foods	7. 1	8. 8
Folded Crops	7. 0	7. 1
Labour on Sheep	11. 6	12. 1
Other Expenses	5. 0	5. 2
Net <u>Depreciation</u> on Breeding Flock	-	-
Total Gross Costs	75. 5	72. 2
<u>Deduct:-</u>		
Value of Wool	8. 3	10. 7
Net <u>Appreciation</u> on Breeding Flock	2. 5	7. 1
Total Credits	10. 8	17. 8
Total Net Costs	64. 9	54. 6
Output Value per Lamb (ex. Wool)	107. 5	101. 7
Net Cost per lb. Deadweight	16.4d	15.1d

Table D3.

Costs and Returns for an Identical Group of 25 Farms.
(Actual Totals).

	1948-49.	1949-50.
Total Number of Lambs Produced	5,143	5,320.
<u>Expenses.</u>	£. s	£. s
Purchases of Sheep	11,950.14	9,262.16
Foods: Hand-fed	1,922. 3	2,487. 3
Grazing (Pasture)	4,077.15	4,695. 1
Folded Crops	1,743. 7	2,012.19
Labour on Sheep	3,104. 2	3,435. 2
Other Expenses	1,341. 4	1,445.13
Total Expenses	24,136. 5	23,338.14
<u>Income.</u>		
Sales of Sheep	31,795.13	32,414.16
Value of Wool	2,220. 9	3,043. 5
Total Income	34,016. 2	35,458. 1
Excess Income over Expenses	9,879.17	12,119. 7
Opening Valuation of Sheep Stock	21,365.14	22,992.11
Closing " " " "	22,992.11	23,896.17
Valuation Increase	1,626.17	904. 6
Valuation Decrease	-	-
Margin (+)	11,506.14	13,023.13

Table D4.

Changes in Costs per Lamb Produced on an Identical
Group of 25 Farms.

	1948-49.	1949-50.
Average Deadweight Per Lamb (lb.):	48	44½
<u>Costs:-</u>	s. d.	s. d.
Purchases of Lambs	26. 8	21. 2
Grazing	15.10	17. 8
Hand-fed Foods	7. 6	9. 3
Folded Crops	6.10	7. 7
Labour on Sheep	12. 1	12.11
Other Expenses	5. 3	5. 6
Net Depreciation on Breeding Flock:	-	-
<u>Total Gross Costs</u>	74. 2	74. 1
<u>Deduct:</u>		
Value of Wool	8. 7	11. 5
Net Appreciation on Breeding Flock:	2. 1	7. 3
<u>Total Credits</u>	10. 8	18. 8
<u>Total Net Cost per Lamb</u>	63. 6	55. 5
<u>Output Value per Lamb (exc. Wool)</u>	108. 2	104. 6
<u>Net Cost per lb. Deadweight</u>	15.9d	15.0d

Table D5.

Numbers and Prices of Sheep Sold.
(Averages for All Farms in Each Year's Sample).

Class of Sheep.	1948-49.		1949-50.	
	No.	Price per head.	No.	Price per head.
Ewes	2249	108. 6	2276	113. 6
Rams and Ram Lambs	75	203. 6	77	183. 0
Lambs of Current Year's Crop:-				
Fat	3971	104.10	3314	103.11
Store	229	85.11	228	81. 3
Sold for Breeding	31	128. 6	74	111. 3
Lambs from Previous Year's Crop:				
Fat	297	134.11	85	119. 4
Store	-	-	162	151.10

