Lambs
Cost of Feeding

UNIVERSITY COLLEGE OF WALES

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DEPARTMENT OF AGRICULTURAL ECONOMICS

OBSERVATIONS ON THE PRODUCTION OF FAT LAMBS IN ANGLESEY 1952 and 1953

BY

CADWALADR J. LEWIS

Price 3/-

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E. F. NASH.

INTRODUCTION

The outbreak of war in September 1939 brought about drastic changes in the farm practices of Anglesey. In the years immediately preceding 1939 the majority of the Island's farmers had developed a system of pastoral farming with the main emphasis on the production of fat cattle drawn as stores from Ireland and the hill districts of Wales, and the production of fat lambs, which were mainly first crosses of the Welsh mountain ewe and a lowland ram, the ram in most instances being Wiltshire Horn or Southdown. The area of land under crops or in fallow in 1939 was only about 11 per cent. of the total area of crops and grass. Oats with nearly 10,000 acres, was by far the most important crop, followed by turnips and swedes (1,823 acres) and potatoes (902 acres).

The population of sheep over one year* on the Island stood at 98,250 on June 4th, 1939 ; this represented a figure of over one sheep to every acre of permanent and temporary grass for grazing. In addition, there were 24,480 cows and other cattle over two years old and 13,363 cattle from one to two years old.**

The war-time "ploughing-up" campaign increased the area under crops from 14,647 acres in 1939 to a maximum of 51,898 acres in 1943—an increase of about 254 per cent. In 1943 the area of crops was about 39 per cent. of the total area of crops and grass. The reduced area of grass had to support considerable increases in the numbers of cattle, particularly dairy cows, as the national policy had placed first priority on milk. The population of cows and heifers in calf increased by 23 per cent. from 1939 to 1945, and other cattle over one year old increased by 10 per cent. in the same period. Sheep numbers therefore were bound to be reduced, and they fell by about 60 per cent. from 1939 to 1945 to the level of 39,048. This figure represented about 0.6 sheep to every acre of grazing.

From 1945 to 1953 the acreage of grazing land showed a steady tendency to rise and the sheep population increased to a level approaching that existing before the war. The rate at which the increase took place has accelerated rapidly since 1948, from 8 per cent. per annum to nearly 20 per cent. per annum in the last two years.

The rate of increase in the acreage of grazing during this period was less rapid than that of sheep numbers, as the acreage of crops, although far less in 1953 than in 1945, was still 68 per cent. above that of 1939. The numbers of cows and heifers in milk and in calf had increased still further by 9 per cent. from 1945 to 1953, and other cattle over one year old had increased by about 2 per cent. in the same period. In 1953 there were about 1.07 sheep to every acre of grazing in the county — a figure that was very nearly equal to the position in 1939. The position in 1953, as compared with that in June 1939, can

* The term "sheep," except where otherwise stated, relates to those over one year old.

** Full details are given in Appendix B.

therefore be summarised as follows :—

(a) There has been an increase of 68 per cent. in the area of land under crops except grass, and a fall of about 9 per cent. in the area of both temporary and permanent grass for mowing. The acreage of grazing land has been reduced by 13 per cent., and the area of rough grazing land has shown a tendency to decline. It is significant also that the proportion of temporary grass to total grass has increased considerably, from 16 per cent. in 1939 to 32 per cent. in 1953.

(b) The stock carrying capacity of the reduced acreage of grazing has increased considerably. Whereas in 1939 each 100 acres of grazing carried 43 cattle over one year old and 111 sheep over one year old, in 1953 the numbers were 58 and 107 respectively.

This comparison indicates that the changed position and emphasis in the farming of the county does to some extent create new problems, and these will become more apparent if the population of sheep is to be maintained at this level for some years. The prospects are that this will be so and indeed that further increases will occur. It is worth noting also that changes in the environment under which the sheep are now grazing on the Island prevent a reversal to the "ranching" methods employed before the war.

This report attempts an examination of the fat lamb industry in Anglesey. It is based on information relating to the grading of sheep supplied by the Ministry of Food, supplemented by quantitative and financial data supplied by farmers on the Island who have co-operated with the Department of Agricultural Economics during 1951-53.

The system of sheep farming in Anglesey

Generally speaking, sheep farming in Anglesey is based on the "flying flock" system, but instead of a complete replacement of ewes each year only a proportion are purchased annually, some of the ewes being kept for two or three years. The fat lambs produced are mainly sold in the year of lambing.

Draft Welsh ewes of about four or five years old are the most common on the Island, and these are purchased from the hill flocks of Caernarvonshire and Merionethshire, and even as far south as Cardiganshire and eastwards to Denbighshire. Some farms on the other hand graze either a flock of draft Kerry ewes or a mixed flock of Kerry and Welsh Mountain ewes. There are also a relatively few flocks of other breeds, Suffolks being probably the most numerous of these. It is difficult to assess accurately the importance of the different breeds of rams that are used in the Island, but it is safe to place the Wiltshire Horn as the most numerous.* Anglesey has been for a long time an important breeding centre for this breed. In 1923, when the Wiltshire Horn Sheep Society was founded, there were over 60 registered pedigree flocks on the Island. There were several lapses from

* R. Phillips & Ll. Phillips, Pedigree Breeding in Wales. Journal of the Royal Welsh Agricultural Society, 1950.

membership in the following years, but when the flock book was re-opened in 1945 the number of registered flocks again rose to 60. In 1952 nearly 300 rams from Anglesey were registered with the Society, this being an increase of 50 over the 1951 figure.* The Wiltshire Horn breed which can be traced in agricultural history for over 200 years is reputed to be particularly prepotent and to have a long life in the flock. One of the main advantages given to the breed is that owing to the fine head and neck and lightness of shoulder, parturition is relatively easy. Lambs of the cross from Wiltshire Horn are very active, and experiments carried out at University College of North Wales, Bangor, in 1901--1916**to compare the various breeds for crossing on the Welsh ewe showed that the Wiltshire ram was very satisfactory for this purpose, as it was able to transmit its rapid growth rate to its progeny. Many farmers keep a small flock of Wiltshire Horn for breeding sires for their Welsh ewe flock, and any surplus to this requirement is sold at annual sales. The Wiltshire flock is kept completely separate from the Welsh ewe flock, as the former prefers as extensive a grazing as is possible—usually two or three ewes grazing with each lot of cattle.

In addition to the Wiltshire Horn, but less extensively used for top crossing, is the Suffolk breed, which gained in popularity soon after the war. The Border-Leicester has also some following in the county and instances of using the Clun and the improved Welsh Mountain have been recorded.

The general practice is to purchase ewe replacements at the September and October draft ewe sales, and on many farms the sheep have the run of a large proportion of the pasture until February or March, when they are usually confined on a smaller acreage of better pasture over the lambing period. There is, as one would expect, some disagreement among farmers as to the merits of early or late lambing, but in the majority of cases the date for turning out the rams is dependent on when the new ewes are bought. Very little hand fed food is given to the ewes prior to lambing, but the practice of feeding high protein foods as a "steaming-up" process—a commendable practice—has been introduced on a few farms. Others reserve some ryegrass, sown under the previous year's straw crops, for grazing to the sheep in February.

A proportion of the lambs, particularly those well forward, are graded off their dams while the remainder are fattened on grass alone and sold fat when they attain a satisfactory weight. Most of the ewes that have completed their second lambing season in the county at the age of six or seven years are graded in the autumn. These again are fattened on grass; hand feeding is rare. Only about 2 per cent. of the breeding flock consists of shearlings and ewe hoggs—all the other lambs are sold off fat.

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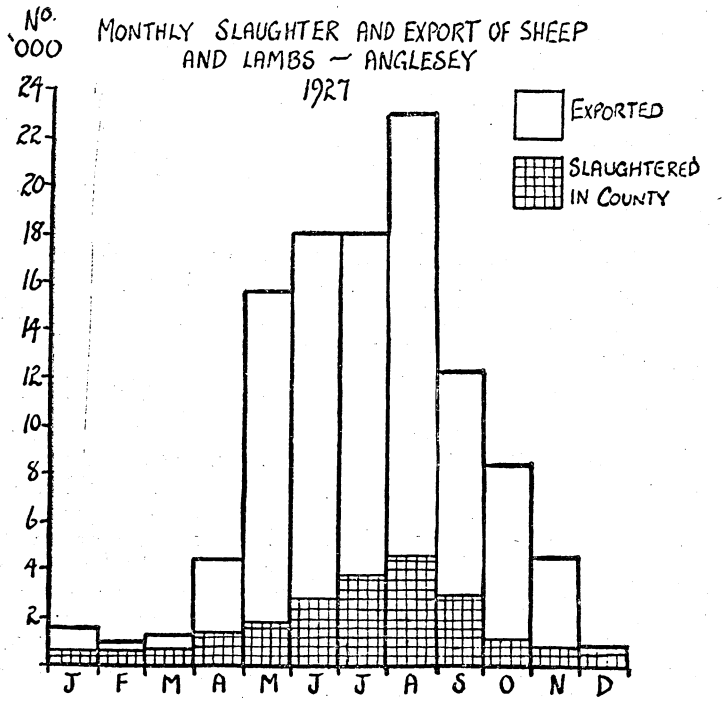
* Information supplied by the Secretary of the Wiltshire Horn Sheep Society.

** "Breeding Experiments with Welsh Mountain Ewes for the production of Fat Lambs," Dept. of Agriculture, University College of N. Wales, Bangor, 1901–1916.

Seasonality of sales and estimated deadweight of lambs

A survey of sheep farming carried out in Anglesey in 1927* showed the characteristic seasonality of the sheep trade in the county—this being due to the practice of fattening on grass. No distinction was possible between lambs and other classes of sheep, but the histogram in Fig. 1 is of interest when compared with the graph for later years in Fig. 3, particularly in view of the forthcoming changes in the marketing of livestock.

FIG. 1.



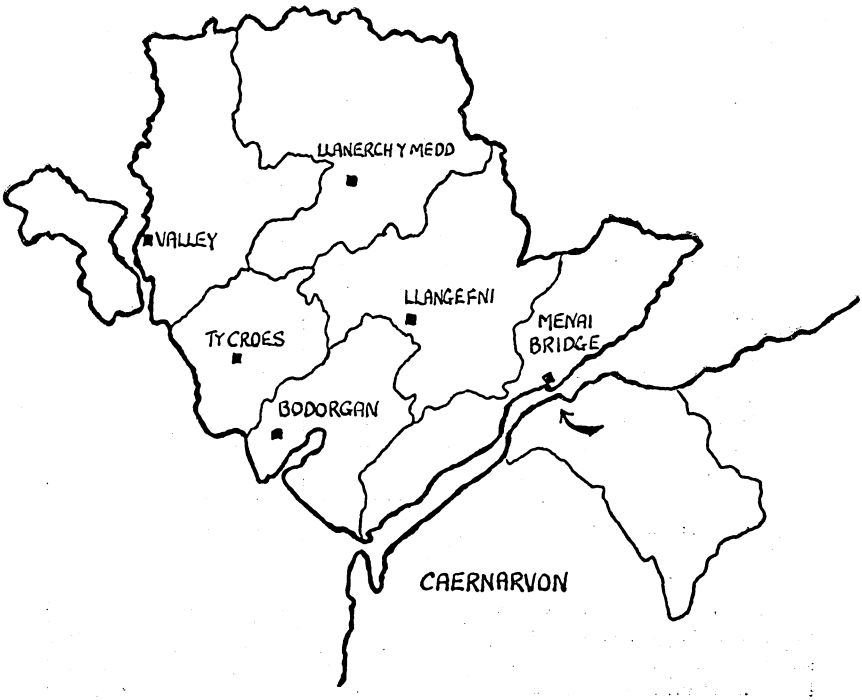
It is reasonable to assume that the pattern of sales shown in Fig. 1 was maintained up to 1939. The peak sales period occurred in August when a considerable proportion of the exportable surplus was sent to the North Wales coast resorts. The number of sheep, presumably lamb and young mutton, produced in May, is of particular significance in view of the data which will be given for 1952 and 1953.

* Unpublished Report on the Production and Marketing of Sheep and Lambs in Wales 1927. T. Lewis.
J. Llefelys Davies, "The Marketing of Sheep in Wales," Report of the Welsh National Conference on the Breeding and Marketing of Sheep, 1931.

The pattern of seasonality of sales in 1952 and 1953 shows considerable differences from that given in 1927. The six collecting centres in Anglesey are Menai Bridge, Llangefni, Valley, Llanerchymedd, Bodorgan and Ty Croes. The areas from which these centres draw fat lambs are given in the map in Fig. 2, where it is seen that Menai Bridge is used as a centre by farmers from the adjoining part of Caernarvonshire, whose lambs amount to about 40 per cent. of the total graded at this centre.

FIG 2.

COLLECTING CENTRES OF FAT STOCK FOR SLAUGHTER IN ANGLESEY



A total of 75,936 lambs were graded at the six collecting centres during 1952. The number increased to 86,155 in 1953. The histograms in Fig. 3 show the distribution of these sales during the two years. In order to assess the influence of lightweight pure Welsh lambs from Caernarvonshire and thus to obtain a true picture of the sales of Anglesey bred lambs, the lambs sold at Menai Bridge have been distinguished from the others in these histograms. For the

same reasons two average E.D.W. (Estimated Dead Weight) curves are given in Fig. 3(A) from the beginning of June to the end of the year. Although the lambs graded at Menai Bridge depressed the average annual E.D.W. in 1953 as in 1952 the difference in 1953 was not of sufficient significance to justify the distinction being made in Fig. 3(B). The inclusion of the lambs sold at Menai Bridge in the total number for the Island's centres tends to increase the proportion of the total lambs sold at the beginning and end of the year and depress the proportion in the period 26/25th July to 20/19th September. This may be due to the practice of keeping lambs for a longer period in Caernarvonshire before selling them fat late in the autumn or early spring as hoggs.

TABLE 1

Percentage of the total lambs graded during various periods in 1952 and 1953.

Fortnight ending*	Per cent. of Total Sales.			
	All Centres.		All Centres excluding Menai Bridge	
	1952	1953	1952	1953
12th Jan.—17th May ..	4.4	5.3	2.7	4.0
31st May—12th July ..	20.0	30.4	19.5	29.1
26th July—20th Sept. ..	45.9	42.4	49.5	46.0
4th Oct. —1st Nov. ...	20.2	12.4	20.3	20.3
15th Nov.—27th Dec. ..	9.5	9.5	8.0	8.7
Total	100.0	100.0	100.0	100.0

* Correct dates for 1953 are a day earlier that those given in the table for 1952

Since the pattern of seasonality of the sales of fat lambs in both years was largely due to the price schedule, the histograms in Fig. 3 should be read in conjunction with Table 2, which gives the changes that occurred in the price per lb. E.D.W. of first grade lambs. This price was applicable to practically all the lambs graded.

TABLE 2

Changes in the Price per lb. E.D.W. 1952 and 1953.† (including any bonus paid per lb.)

First Grade Lambs

Period ending*	Pence per lb.		Period ending*	Pence per lb.	
	1952	1953		1952	1953
June 8 ...		42¼	Sept. 21 ...	29½	30
„ 15 ...	41¼	41¾	„ 28 ...	29	29½
„ 22 ...	40¾	39¾	Nov. 23 ..	28¾	29¼
„ 29 ...	40¼	37¾	Dec. 7 ...	29¼	29¾
July 6 ..	31	34½	„ 14	29¾	30¼
„ 13 ...	31	33	„ 21 ...	30	30½
August 24 ..	31	31½	„ 28 ..		30¾
„ 31 ..	30¾	31¼			
Sept. 7 ...	30¼	31			
„ 14 ...	30	30½			

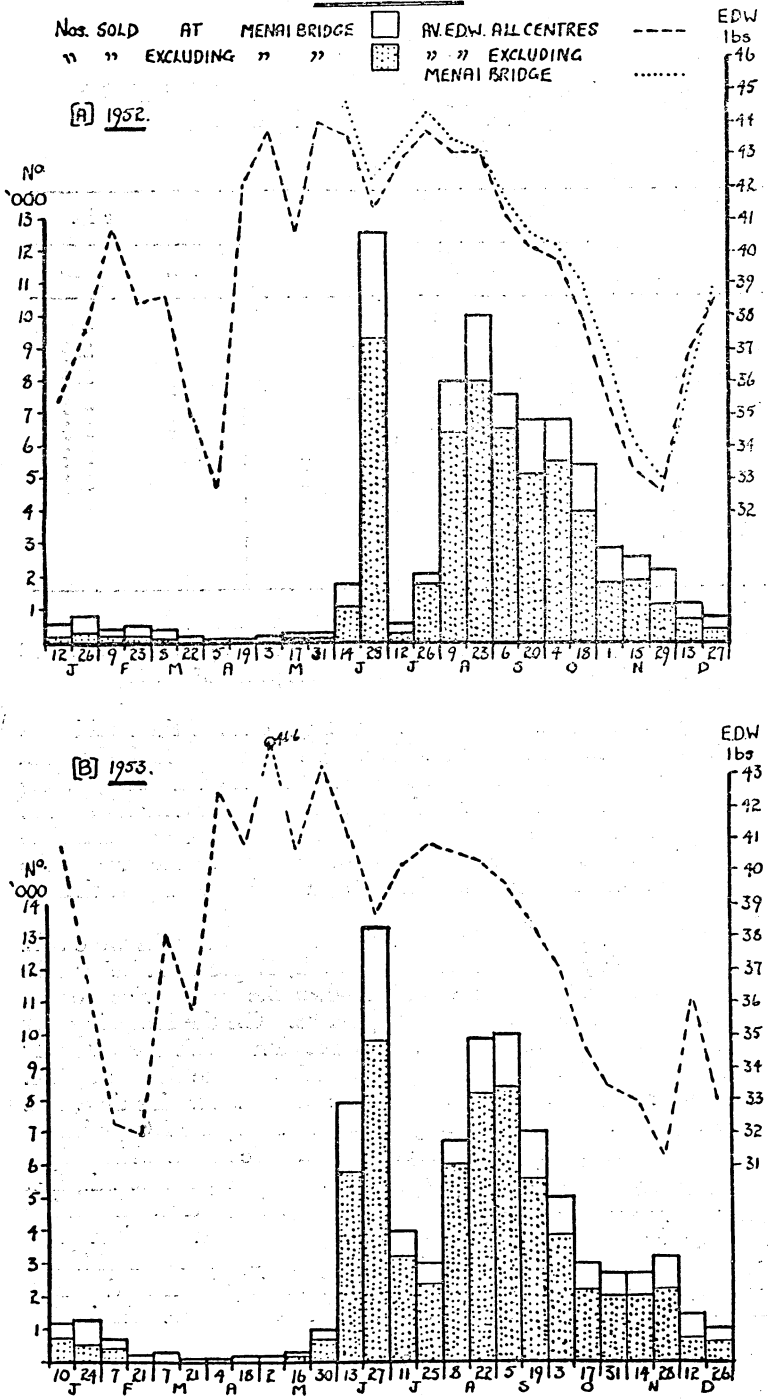
* The dates in 1953 were one day before those shown in Table 2.

† In addition there were headage payments ranging from 2/- to 6/- in 1952, and from 3/- to 7/- in 1953, depending on weight and period of grading.

As was seen in Table 1, only about 5 per cent. of the total lambs sold in both 1952 and 1953 had been graded up to mid-May, but during June in both years the numbers presented at the grading centres increased rapidly to a peak in the fortnight ending 28/27th of the month. In 1953 this increase was somewhat more gradual than in 1952 and reference to Table 2 will show that this was due to the more gradual decrease in price that existed in the latter year than in 1952.

In 1952 18.7 per cent. of the annual sales of fat lambs were sold in the four weekly period ending June 28th, 17 per cent. being sold in the latter fortnight of this period when the gross price per lb. E.D.W. for first grade lambs was 40¼ pence. On the following day the price fell to 31 pence. The farmers' reaction to this was naturally to grade most of the lambs that would qualify before the 29th June. It is surprising that far more lambs were not graded at this time, as a 35 lb. E.D.W. lamb would fetch £6 1s. 1½d. on June 28th, whereas if kept for a further ten weeks, when it would have increased in weight to about 45 lbs. E.D.W., its value would have been £5 19s. 3d., i.e., 1/10½d. less. In addition, the lamb would have entailed further costs and have faced all the hazards of disease and weather. But whether as a result of honesty or ignorance a large number of lambs that would have yielded higher returns had they been sold before June 29th were kept on the farms and sold at a later date. In the few

FIG.3 FORTNIGHTLY SALES AND AVERAGE E.D.W. OF FAT LAMBS IN ANGLESEY.



weeks following this rapid fall in price the few lambs that were sold were graded on average at 42 lbs. to 43.5 lbs. E.D.W., and during August up to 30 per cent. of lamb sales were over 45 lbs. E.D.W.

The more gradual fall in price during the corresponding period of 1953 rectified the anomaly created by the 1952 price schedule so that a 35 lb. E.D.W. lamb on 28th June would yield 9/1d. more when kept for another 10 weeks, when it should weigh about 45 lbs. E.D.W. Another result of this gradual fall in price was the marked increase in the sales of fat lambs in the first fortnight of June 1953 compared with the corresponding period in 1952. In the month ending 27th June, 1953, 24.6 per cent. of total annual sales of fat lambs took place, this being nearly 6 per cent. more than in 1952.

It is more than likely that the changes in prices following June 1954 will not be similar to those that were prepared by the Ministry of Food. It is therefore interesting to note that an examination of the grading returns for 1952 and 1953 has shown that Anglesey can grade at least 18.7 per cent. of its lambs at an average weight of 41.7 lbs. before the end of June, and that it is possible for 24.6 per cent. to be sold at 39.5 lbs. E.D.W. in the same period, although it should be remembered that the lower weight in 1953 was not solely due to the increased percentage but that weather conditions, etc., should also be considered. Nevertheless, in both years the average E.D.W. in June was higher than the annual averages which stood at 40.4 lbs. in 1952 and 38.5 lbs. in 1953. We shall return to the significance of this point later in the discussion.

The fall in the number of lambs presented in the first fortnight after the 28th of June was far less drastic in 1953 than in 1952, this again being due to the differing price schedules (Table 2). During August the number of lambs sold increased to a second peak in the last fortnight of the month. This peak was maintained into September in 1953, and in this year the subsequent drop was more rapid than was the case in 1952. Table 1 shows that 45.9 per cent. of the annual throughput of lambs at all centres during 1952 (42.4 per cent. in 1953) were graded between 26th July and 20th September.

The average E.D.W. curve in both years show strikingly similar trends, though the average E.D.W. in 1953 was throughout much lower than in 1952. As the number of lambs sold before May 30th was very small we shall be concerned with only those lambs graded after that date. The E.D.W. in both years fell during the fortnight ending June 28/27th, and after a subsequent increase to a peak in the fortnight ending July 27/26th fell continuously until the end of November.

This tendency for the average E. D.W. to fall in the later part of the season in the manner shown in Fig. 3 is rather puzzling, and although the evidence is not conclusive in that only two years have been investigated, there are strong indications that this feature is characteristic of fat lamb production in Anglesey. In other words, it appears that lambs do not make satisfactory liveweight increases

after the end of July. Probable reasons for this state of affairs will be discussed later on in this report.

Although the essential pattern of the distribution of the sales of fat lambs at each centre was uniform, there were minor differences in the timing and amplitude of the peaks. The histograms and graphs in Fig. 7, Appendix D, show that Ty Croes and Bodorgan for example had a more uniform rate of presentation during each fortnight given ; the fall in the number graded during late September at Valley in 1953 was far greater than at any other centre. The rate at which the average E.D.W. fell after the end of July also differed from centre to centre. The smallest fall was at Bodorgan, and the greatest at Llangefni, although there was a slight improvement at the latter during 1953. Menai Bridge is not completely comparable with the other centres, as it is possible that the rapid fall in weight towards the end of the period shown was due to lightweight pure Welsh lambs from Caernarvonshire.

Table 3 gives the overall annual total of lambs graded at each of the six centres and their average E.D.W. for 1952 and 1953. There were considerable differences in the number sold at each centre, but the average E.D.W. was roughly of the same order at each centre. Excluding Menai Bridge the range in 1952 was 1.4 lbs., and in 1953 slightly higher at 1.8 lbs. E.D.W.

TABLE 3

Annual number of fat lambs and their average E.D.W. sold at Six Collecting Centres in Anglesey 1952 and 1953

	No. of Lambs Sold		Average E.D.W.	
	1952	1953	1952	1953
			lbs.	lbs.
Bodorgan	5,822	7,494	41.4	39.9
Llanerchymedd	15,944	18.202	42.0	38.8
Llangefni	11,253	15,824	40.8	39.8
Menai Bridge	19,281	19,260	38.1	36.9
Ty Croes	7,693	8,283	40.7	38.8
Valley	15,673	17,092	40.6	38.1
All Centres	75,936	86,155	40.4	38.5
Do. ex. Menai Bdge.	56,655	66,895	41.1	39.0

Table 4A shows that the biggest percentage of all lambs graded in 1952 was in the weight group 40 lbs. to 44.9 lbs. E.D.W. 59.2 per cent. of all lambs graded were over 40 lbs. E.D.W., and 83.7 per cent. over 35 lbs. E.D.W.

TABLE 4

Proportion of the total annual sales of fat lambs in different weight groups

A. 1952

Weight Group lbs. E.D.W.	Bod-organ	Llan-erchy-medd	Llan-gefni	Menai Bridge	Ty Croes	Valley	All Centres
Up to 34.9 ..	6.3	6.6	16.3	30.5	14.3	13.4	16.3
35 „ 39.9 ..	27.3	21.6	21.6	26.2	24.2	26.4	24.5
40 „ 44.9 ..	43.9	45.8	37.3	27.1	36.7	36.4	36.7
45 „ 49.9 ..	18.3	17.8	18.3	13.1	22.8	18.4	17.4
50 and over ..	4.2	8.2	6.5	3.1	2.0	5.4	5.1
Total .	100.0	100.0	100.0	100.0	100.0	100.0	100.0

B. 1953

Weight Group lbs. E.D.W.	Bod-organ	Llan-erchy-medd	Llan-gefni	Menai Bridge	Ty Croes	Valley	All Centres
Up to 34.9 ..	13.6	17.1	16.9	33.2	15.9	22.9	21.4
35 „ 39.9 .	34.6	40.4	28.2	36.3	40.9	37.2	36.2
40 „ 44.9 ..	36.4	31.3	38.8	23.4	32.3	29.6	31.1
45 „ 49.9 .	10.8	8.8	11.8	5.5	7.8	7.5	8.4
50 and over ..	4.6	2.4	4.3	1.6	3.1	2.8	2.9
Total .	100.0	100.0	100.0	100.0	100.0	100.0	100.0

In Table 4B, on the other hand, the weight group 35 lbs. to 39.9 lbs. E.D.W. contained the biggest proportion of the total number of fat lambs sold in 1953. 42.4 per cent. (i.e., about 17 per cent. less than in 1952) of the sales were over 40 lbs., and 78.6 per cent. (5 per cent. less than in 1952) were over 35 lbs. E.D.W. The proportion of total sales between 35 lbs. and 50 lbs. E.D.W. in 1952 was 78.6 per cent., compared with 75.9 per cent. in 1953 and 75 per cent.* in 1950.

There was considerable variation between the six centres in both years. Menai Bridge again shows the influence of light pure Welsh lambs mainly from Caernarvonshire in that in both years over 30 per cent. of the lambs sold were under 35 lbs. E.D.W. Whereas in 1952 all centres had the highest percentage of lamb sales in the group,

* R. Phillips—"The fat stock of Anglesey and Caernarvon." J. Agri. Sci., Vol. 43, Pt. 4.

40-44.9 lbs. E.D.W. in 1953, only two centres, Bodorgan and Llangefni, had the highest percentage of sales in this group. Incidentally, it was these two centres that had the highest average E.D.W. in 1953 (see Table 3). Particularly good results were obtained with lambs sold at Bodorgan and Llanerchymedd in 1952, with only 6.3 per cent. and 6.6 per cent. respectively of total sales under 35 lbs. E.D.W. The latter of these centres, which boasted the highest average E.D.W. in that year, graded 71.8 per cent. of its lambs at over 40 lbs. E.D.W. The position in 1953 at Llanerchymedd was far less favourable regarding average E.D.W., and the percentage of sales over 40 lbs. E.D.W. had fallen by nearly 30 per cent. to 42.5. This indicates the variation that can occur as a result of weather, price structures, etc.

Table 5, when read in conjunction with Fig 3, shows in more detail how the average E.D.W. of lambs fell from mid-July to mid-November, and also shows the range of the distribution of lambs into the various weight groups seen in Table 4.

TABLE 5

Percentage of fortnightly sales of fat lambs in five weight groups (E.D.W.)

Fortnight ending*	Average E.D.W. lbs.										1952 1953
	Up to 34.9		35—39.9		40—44.9		45—49.9		50 & over		
	1952	1953	1952	1953	1952	1953	1952	1953	1952	1953	
June 14	8.6	9.1	17.8	33.1	36.9	38.7	20.1	12.3	16.6	6.8	100
,, 28	6.1	13.9	29.9	49.4	39.8	29.4	18.6	6.3	5.6	1.0	100
July 12	7.2	10.4	11.8	38.4	42.5	38.9	34.3	9.6	4.2	2.7	100
,, 26	3.0	3.1	12.1	35.0	43.0	47.1	34.5	13.7	7.4	1.1	100
August 9	1.7	5.1	17.2	35.5	48.6	44.8	26.0	12.2	6.5	2.4	100
,, 23	2.6	6.8	18.8	35.8	49.0	42.9	22.2	11.4	7.4	3.1	100
Sept. 6	6.9	9.5	29.3	42.5	41.5	36.1	18.7	10.0	3.6	1.9	100
,, 20	12.7	16.2	29.9	48.2	40.2	28.1	14.0	5.9	3.2	1.6	100
Oct. 4	15.2	30.1	34.8	45.1	34.6	18.8	12.4	5.2	3.0	0.8	100
,, 18	30.6	52.1	29.3	27.5	26.2	14.8	11.5	4.7	2.4	0.9	100
Nov. 1	48.3	64.4	22.8	19.0	19.0	12.7	6.0	3.6	3.9	0.3	100
,, 15	64.7	69.4	14.5	15.2	16.1	9.9	4.6	4.3	0.5	1.2	100
,, 29	67.5	75.0	16.2	12.3	10.8	11.0	3.7	1.0	1.8	0.7	100

* Correct dates for 1953 are a day earlier than those given which are for 1952.

In 1953 the proportion of lambs in the lower weight groups was far higher at the beginning of the peak lamb sales period than in 1952. There was a corresponding fall in the percentage in the higher weight groups. The proportions in the middle weight group of Table 5 were roughly the same. In addition to this tendency for the 1953

lambs to begin the season at a lighter weight than in 1952 the transference to the lower weight groups took place earlier, ranging from about a fortnight to a month. For example, the decrease in the proportion of lambs in the weight group 40–44.9 lbs. E.D.W. (which is the most important group) began in 1952 in the fortnight ending 23rd August, compared with fortnight ending 26th July in 1953. The rate of transfer of lambs from the weight group 35–39.9 lbs. E.D.W. to the lower one in 1953 was far more rapid than in 1952 and the percentage of lamb sales in the higher weight groups was consistently higher in 1952 than 1953. So that in addition to starting the season in a poorer position the lambs sold in 1953 moved towards the bottom left of Table 5 at a quicker rate. This tendency, although more pronounced at Menai Bridge, was common to all centres.

Seasonality of the sales and average E.D.W. fat ewes.

A total of 19,014 ewes were sold fat at the six collecting centres of Anglesey during 1952; their average E.D.W. was 42.6 lbs. In 1953 this number had increased to 24,763, and the average E.D.W. had fallen by just over $\frac{1}{2}$ lb. to 42.0 lbs. When the average E.D.W. of the ewes is compared with that of their lambs we find that the Welsh ewe, under the conditions existing in Anglesey, produced a fat lamb only 5.4 per cent. less in weight than itself in 1952, and about 9 per cent. less in 1953. The 1953 figure is high owing probably to the higher proportion of total lamb sales occurring at an earlier date than was the case in 1952 and also to the poorer conditions prevalent in 1953. Phillips* corresponding figure was still lower at 2.6 per cent.

Table 6 gives the relative importance of the various centres as regards numbers presented and average E.D.W. of ewes.

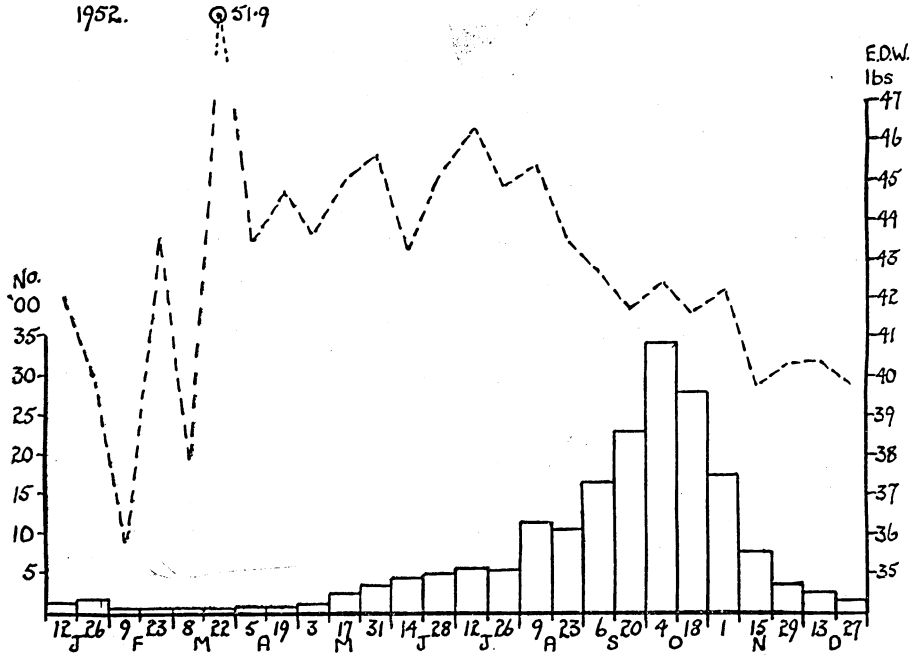
TABLE 6

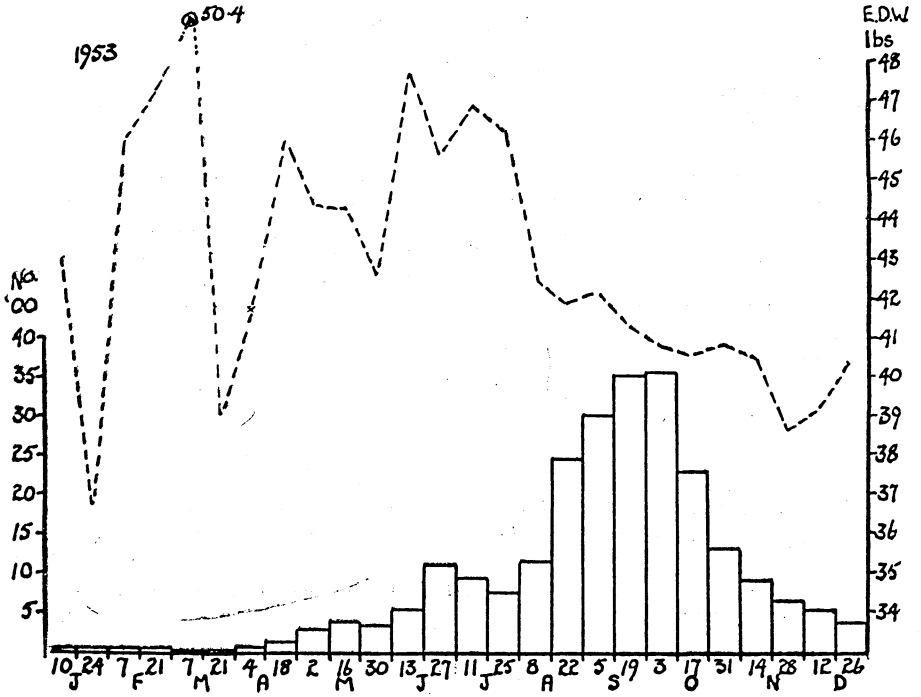
Number of ewes sold and their average E.D.W.—Six Centres

Centre	No. of Fat Ewes Sold		Average E.D.W. lbs.	
	1952	1953	1952	1953
Bodorgan	2,173	2,195	42.0	41.9
Llanerchymedd	3,936	6,483	43.2	41.5
Llangefni	2,769	4,083	46.0	43.8
Menai Bridge	4,111	4,461	42.2	42.4
Ty Croes.....	2,625	3,058	41.3	41.8
Valley	3,400	4,483	41.1	41.1
All Centres ...	19,014	24,763	42.6	42.0

* R. Phillips—"The Fat Stock of Anglesey and Caernarvon." J. Agri. Sci., Vol. 43, Pt. 4.

FIG. 4. FORTNIGHTLY SALES AND AVERAGE E.D.W OF EWES IN ANGLESEY





The difference between centres in the average E.D.W. of ewes is more than one would expect. This is particularly so at Llangefni, where in 1952 the E.D.W. was nearly 3 lbs. higher than the next highest of 43.2 at Llanerchymedd. Some explanation for this is obtained when it is known that at the end of October 336 ewes were graded at 50.9 lbs. E.D.W. at Llangefni, and it is possible that a large proportion of these were Kerries or Suffolk. The same tendency was again true but to a much lesser extent in 1953 when Llangefni's ewes were nearly 1½ lbs. E.D.W. heavier than the next highest, this time Menai Bridge.

The distribution of the total annual sales of fat ewes and the changes in the fortnightly average E.D.W. during 1952 and 1953 are seen in Fig. 4.

The exclusion of ewes sold at Menai Bridge made no significant difference in the trends. Up to the beginning of May in each year only 3 per cent. of the annual total had been graded, these ewes being most probably barren, unthrifty or suffering from some ailment or other. The average E.D.W. during this period fluctuated considerably, but is of little significance as it represents only a small number of ewes. During May and June the number of ewe sales increased. These were for the most part some more barren ewes and ewes that had lost lambs and had no orphans placed with them. It is also possible that towards the end of June and during July many of the ewes sold were mothers of lambs sold during May and early June.

The main exodus of fat ewes from the Anglesey farms to the collecting centres occurred during August, September and October, when in 1952 about 75 per cent., and in 1953 77 per cent. of the annual total were sold. The histograms in Fig. 4 show that during these months of 1953 ewes were sold from about a fortnight to a month earlier than in 1952, i.e., the peaks have tended to move to the left. Whereas between the 9th August and 19th September, 1953, 40 per cent. of the total sales had taken place; in the corresponding period of 1952 the figure was only 21 per cent. Again, 32 per cent. of total sales were graded after 3rd October, 1952, compared with only 25 per cent. in 1953. The average E.D.W. of ewes fell from between 46–47 lbs. at the beginning of July to between 41–42 lbs. at the end of September. During the peak sales period the average E.D.W. was relatively steady at 42 lbs. in 1952 and 41 lbs. in 1953.

In addition to those ewes from Anglesey that were graded fat about 1,360 ewes were sold as "casualties" in 1952, and about 1,000 in 1953. These ewes in the majority of cases were only saved from being classed as mortalities and buried by their ability to remain alive long enough to be rushed to the abattoir. Their value was often limited to that of their skin and a small percentage of meat which was marketable. As such their importance in output figures is negligible but for interest their numbers are given in Table 7.

TABLE 7

Numbers of "casualty" ewes graded at the six Collecting Centres 1952 and 1953

Centre.	No. of "Casualties" Sold	
	1952	1953
Bodorgan	112	67
Llanerchymedd	214	145
Llangefni	324	213
Menai Bridge	463	355
Ty Croes.....	59	18
Valley	790*	753*
All Centres ..	1962	1541

* Includes approximately 600 imported ewes graded as casualties on arrival at Holyhead

Mortality and "Replacement Rate" of Ewes

Given the number of ewes sold fat at the six collecting centres in Anglesey and the data relating to sheep in the Agricultural Returns for December and June, it is then possible to arrive at a rough estimate of the death rate of ewes on the Island and the rate of exodus (deaths and sales) from the county's farms. The basic data are given in Table 8. Allowance has been made for those ewes graded at Menai Bridge which were drawn from Caernarvonshire, viz., it has been assumed that of the total graded at this centre 40 per cent. were drawn from the mainland, and these have been deducted in the following data and calculations.

TABLE 8

		1952		1953
Number of Ewes :				
4th Dec.*	1951	67,875	1952	80,601
4th June	1952	58,759	1953	72,841
Ewes Sold Fat :				
December	1951†	100	1952	152
Jan.—May (inc.) ..	1952	1,173	1953	1,361
June—Dec. (inc.) ..	1952	16,326	1953	21,655

* Includes ewes, shearlings and ewe lambs put to rams in that year.

† Dec. 1951 sales of fat ewes are an estimate based on Dec. 1952 figures.

The June 1952 population of ewes was 9,116 less than that of December 1951 ; the fall in the corresponding period of the following year was less at 7,760. From Table 8 it can be seen that of this difference 1,273 ewes were sold fat in these six months of the former year, and 1,513 in the corresponding period of the latter year. There are therefore 7,843 ewes unaccounted for between December 1951 and June 1952 and 6,247 in the following year. The probable reasons for this remaining difference between the December and June figures are :

(a) Ewes sold as stores to purchasers outside the county.
(b) Ewes which were grazed on tack on the Island in December but which had returned to the mountains by June.
(c) Ewes sold as "casualties."
(d) Ewes that had died in the intervening months.

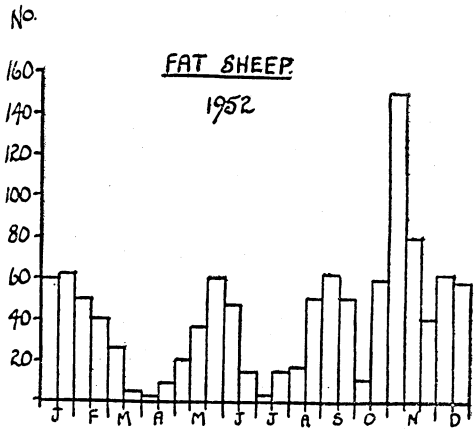
The first and second possibilities are unimportant, as very few ewes are sold from the county in store condition, and the number of ewes on tack is negligible. We are therefore left with the last two reasons, and since "casualties" can justifiably be regarded as deaths we find that 11.5 per cent. of the population of ewes in Anglesey on 4th December, 1951, had died in the following six months. In 1953 the figure was somewhat better at nearly 8 per cent. Since it is possible that the 4th June population of ewes in the county has been inflated by purchases of "couples" in the two previous months, the mortality rate given above can be regarded as conservative. It can be seen therefore that, although the data available are not complete and only cover two years, the mortality rate of ewes in Anglesey tends to be of a serious nature, so much so as to warrant further investigation into causes and effects.

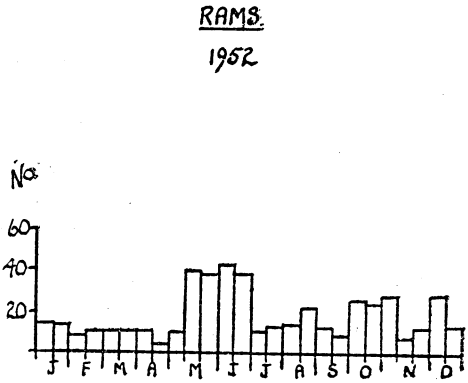
If the number of fat ewes sold after 4th June is added to the difference between the December and June population of ewes on the Island the resulting total, when expressed as a percentage of the December figure, gives an approximate indication of the annual "wastage" of ewes in the Anglesey flocks. If it is assumed that the flock size remained constant, this "wastage" can also be considered as the replacement rate. In 1952 the replacement rate was calculated on the above basis as 37.5 per cent., and in 1953 as 36.5 per cent. of the December population of ewes, but when ewe deaths after June 4th are allowed for the figure would be nearer 40 per cent. This gives some idea of the extent to which the "flying flock" principle is adopted in Anglesey.

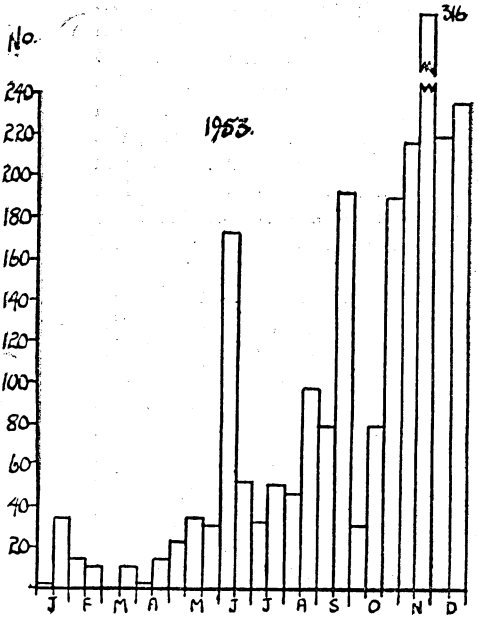
Fat Sheep and Rams

Since the whole emphasis of sheep production in Anglesey is placed on the marketing of fat lambs in the year in which they were born the position of mature lambs and wethers is of very little importance. Only 1,087 fat sheep (i.e., yearlings and wethers) were sold in 1952, and although the number sold in 1953 was more than twice that in 1952 the relative importance to be ascribed to such sheep remains slight.

FIG. 5. FORTNIGHTLY SALES OF FAT SHEEP AND RAMS.







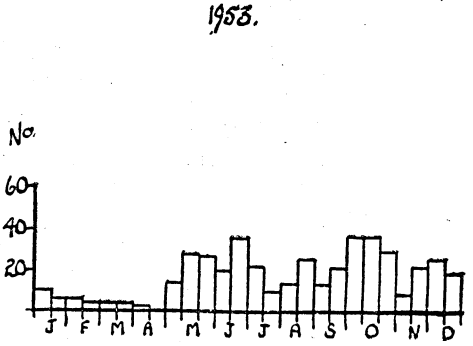


TABLE 9

Sales and average E.D.W. of Sheep and Rams in Anglesey 1952 and 1953

Centre.	SHEEP				RAMS			
	1952		1953		1952		1953	
	No. sold	Aver. E.D.W.	No. sold	Aver. E.D.W.	No. sold	Aver. E.D.W.	No. sold	Aver. E.D.W.
		lb.		lb.		lb.		lb.
Bodorgan	127	45.6	141	45.1	44	65.5	46	66.1
Llanerchymedd	141	51.0	492	38.3	67	72.6	88	72.4
Llangefni	496	40.0	353	39.7	52	75.0	87	74.5
Menai Bridge	323	36.7	773	37.7	129	65.5	135	60.3
Ty Croes	—	—	143	44.6	35	69.7	35	70.9
Valley	—	—	290	42.3	130	70.9	67	74.3
All Centres	1,087	41.1	2,192	39.7	457	69.2	458	68.7

Menai Bridge, Llangefni and Llanerchymedd are the most important centres for the collection of fat sheep. The first of these centres graded 30 per cent. and 35 per cent. of the total in 1952 and 1953 respectively, but in each case at an average E.D.W. much lower than the average for all centres. It is also interesting to record that in 1952 only 35 sheep passed through Menai Bridge centre after the end of July, and that in 1953 the same tendency was evident, but to a much lesser degree. In this respect this centre differs from the others, where sales are concentrated in the autumn and early winter. At all centres the average E.D.W. of sheep fell rapidly with the increase in numbers presented this being particularly so after September.

Fig. 5 shows the distribution of the sales of "fat sheep" and rams during 1952 and 1953. The pattern for fat sheep was essentially similar in both years, but in 1953 the peaks were more pronounced owing to the increase in the numbers sold. In addition the proportion of total sales which occurred in January and February of 1953 was far less than in the corresponding months of 1952, and the pressure of sales in the last two months of 1953 was far greater than in the same months of 1952.

The sale of fat rams was concentrated in two periods: firstly in May and June, by which time they would have improved on spring pasture, and during October. This latter peak is interesting in that many of these rams had probably been kept with a view to using them at tupping time, but for some reason they were rejected. It is also possible that some had already been turned to the ewe flock.

The ram population of Anglesey on 4th December, 1951, was 1,706, and if we deduct 40 per cent. of the rams graded fat at Menai

Bridge as having been drawn from Caernarvonshire from the total number of rams graded at the six centres we find that about 24 per cent. of the ram population in December 1951 were sold fat. The corresponding figure for 1953 when the December 1952 ram population was 2,301 is 17.5 per cent. Phillips* in 1950 calculated a figure of about 27 per cent. It appears, therefore, that from about a fifth to a quarter of the ram population is sold fat each year, i.e., the effective life of a ram in the Anglesey flocks is from four to five years. The low percentage in 1953 may be due to farmers keeping their rams for another season owing to the large increase in the ewe population. It is possible therefore that the 1954 figure will be of the 1950 and 1952 order.

Output of Meat

1,764 tons of meat were produced in 1952 by all classes of sheep graded as fat from the six collecting centres in Anglesey. The 1953 output was very nearly 2,000 tons. The relative importance of the contribution of each class of sheep, both in numbers and meat produced can be seen in Table 10. No allowance has been made for those Caernarvonshire sheep sold at Menai Bridge.

TABLE 10

Summary of the total numbers and average E.D.W. of Fat Sheep sold at six collecting centres in Anglesey 1952 and 1953.

Class of Sheep.	Number Sold	Per cent. of Total Sold	Average E.D.W. lb.	Total E.D.W. cwts.	Per cent. of Total Weight
A. 1952:					
Lambs	75,936	78.7	40.4	27,372	77.5
Ewes	19,014	19.7	42.6	7,239	20.5
"Sheep"	1,087	1.1	41.1	399	1.2
Rams	457	0.5	69.2	283	0.8
Total 1952	96,494	100.0	41.0	35,293	100.0
B. 1953:					
Lambs	86,155	75.9	38.5	29,632	74.1
Ewes	24,763	21.8	42.0	9,296	23.2
"Sheep"	2,192	1.9	39.7	777	2.0
Rams	458	0.4	68.7	281	0.7
Total 1953	113,568	100.0	39.4	39,986	100.0

* R. Phillips—"The Fat Stock of Anglesey and Caernarvon." J. Agri. Sci., Vol. 43, Pt.4.

It is interesting to note that on the basis of the above figures for 1952 an increase of 1,783 ewes sold fat, that is, a 2.6 per cent. reduction in the mortalities of the ewe population in December 1951, would be equivalent to the production of an extra 1 lb. E.D.W. per lamb sold fat in 1952, i.e., 75,936 lb. E.D.W., which is 2.5 per cent. of the total lamb meat produced. In addition, should the deaths be so reduced, the number of fat lambs sold, and lambs produce more valuable meat than ewes, would in all probability increase by about 2 per cent.

Again, by using the data in Table 10, it is possible to obtain a very rough measure of the output of meat per head of the ewe population in December 1951 and 1952 under the system of sheep husbandry practised in Anglesey. Deducting 40 per cent. of the meat from ewes and lambs that went through Menai Bridge it is calculated that 51.75 lbs. E.D.W. were produced in 1952 (i.e., from ewes and lambs), for every ewe in Anglesey in December 1951. The corresponding figure for 1953 was 49.63 lbs. E.D.W. These are relatively rough measurements as the lamb output includes some lambs brought into Anglesey from the neighbouring upland regions in store condition to be fattened on the Island. Nevertheless, as the figures for the two years are so similar, and since the corresponding measurement based on data given by Phillips for 1950 is approximately 55 lbs. E.D.W., the calculation does provide at least an order of magnitude under the given conditions of management.

Financial and other results from a sample of farms in Anglesey

In 1951/52 and 1952/53 information regarding the sheep enterprise was collected from 28 and 27 farms respectively. These surveys assisted in obtaining a more detailed examination of practices employed and their results, and when added to the analysed data of the Ministry of Food returns provided a better insight to the sheep farming of Anglesey. The differences between the results of the two surveys are so small as not to warrant detailed descriptions of the two years. The tables in the text therefore and most of the discussion will relate to data for 1951/52. Tables for 1952/53, corresponding to those for 1952 given in the text, will be found in the Appendix. There were three changes in the sample in 1953 compared with that used in 1952.

The average size of the farms included in the survey is considerably larger than the average for the whole county. Whereas this detracts a little from the value of the results it is nevertheless true that generally speaking sheep are only important on the large farms of over 70–100 acres. The average acreage of cereals, mainly oats and mixed corn, was about 16 per cent. of the total average acreage ; roots and green crops were not important on the majority of farms. Table 11 also indicates that although dairy cows contributed considerably to production, there was also a strong tendency towards store and fat cattle production.* The intensity of sheep-carrying on the 28 farms

* As these figures are for the 1st November the importance of summer fattening of beef on many of the farms is not fully indicated in Table 11.

was about 0.8 ewes per acre of total land. This suggests that on these farms the intensity was far higher than on all farms on the Island, where 0.9 sheep over one year old were kept for every acre of pasture land only in 1952.*

TABLE 11

Land Utilisation and Number of Livestock on Farms in Size Groups 1952

Size Group (Acres)	No. of Farms	Land Utilisation (acres). Cereals	Roots	Rape & Kale	Total Acres	Nos. of Livestock (Nov. 1,1951) Cows & Heifers Dry & in Milk	Other Cattle Over 1 year	Calves	Sheep Ewes
Up to 50 ...	1	3.0	—	—	23.0	—	6.0	—	55
51—100 ...	5	14.3	1.1	3.8	80.2	10.8	16.2	5.8	84
101—150 ...	6	19.3	1.7	2.6	124.3	8.7	26.2	6.5	141
151—200 ...	9	26.6	3.6	1.5	179.9	10.9	30.7	9.1	137
201—250 ...	3	30.0	6.2	2.3	210.3	15.3	33.0	10.7	200
251—300 ...	4	50.8	3.4	2.8	270.0	16.0	35.8	22.5	153
All Farms	28	26.7	3.0	2.3	160.7	11.2	27.2	9.7	135

With three exceptions, all the flocks in the sample consisted of Welsh Mountain ewes and Wiltshire Horn rams. The exceptions in both years were two flocks which contained Kerry and Welsh Mountain ewes, and one flock which in 1952 had an improved Welsh Mountain ram, and in 1953 had this same ram, together with a Wiltshire Horn.

In common with most farms on the Island the "flying flock" principle was applied to all the flocks. 40 per cent. of the ewes in the flocks on 1st November of the previous year were sold fat during 1952 (38 per cent. in 1953), and when deaths and casualties are added the "replacement rate" was around 50 per cent. in both years. Two main types of grazing systems were employed on the Survey farms. In practically all farms the ewes had the freedom of a large proportion of the farm's grazing during the winter months. In February they were usually confined to a smaller area for ease of work at lambing. Thereafter some farmers reserved a fixed acreage of the farm for sheep only. This paddock was usually divided into two of approximately equal acreages so as to practise alternate grazing. Only where the growth of grass was in excess of the sheep's requirements were young cattle allowed to graze. In addition to this land lambs, particularly the late born and twins, were allowed on to rape mixtures and earlier

*Appendix B., Table 4.

lambs on to aftermath prior to sale. Other farmers on the other hand had no such rigid programme and preferred to graze the sheep throughout the spring and summer in company with store cattle, though many lambs, as in the first case, were given special treatment on aftermath or rape. Never were the sheep allowed on the cattle fattening fields, though there were some gate crashers and hedge hoppers.

Table 12 gives the distribution of the flocks in size groups. The biggest concentration was in the flocks of between 100 and 125, and from observation one would say that this group is among the most common on the Island. It is a manageable size for one man and yields a satisfactory total return to the farm.

TABLE 12

Distribution of the sizes of ewe flocks on 1st November, 1951

Size-Group	Number of Flocks	Average No. in Flock
(Ewes)		
Up to 50	3	35.0
51 „ 75	4	56.3
76 „ 100	1	90.0
101 „ 125	8	111.6
126 „ 150	2	143.0
151 „ 175	2	168.0
176 „ 200	—	—
201 „ 225	4	206.3
225 and over ...	4	252.0
All Farms	28	134.6

Disposal of Lambs

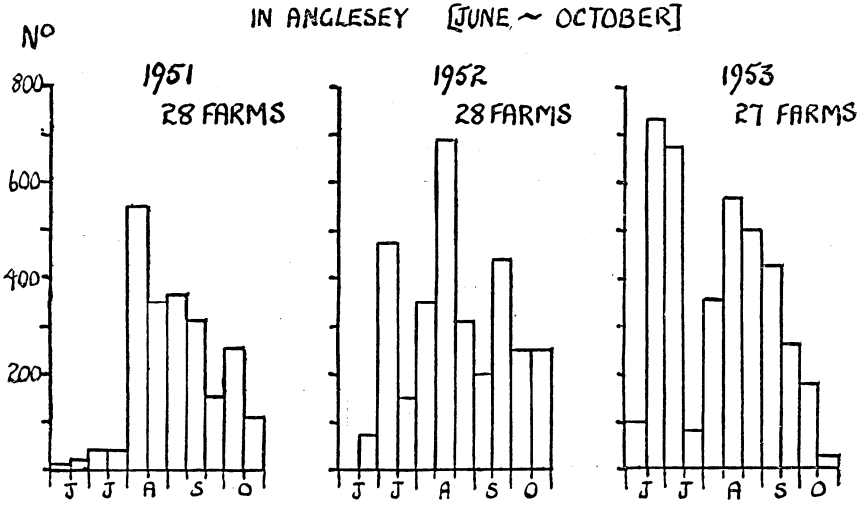
3,876 lambs were produced (i.e., sold and on hand at the end or the year) during 1951/52 from 28 farms. The 27 farms in the 1952/53 sample produced 4,391 lambs. Table 13 gives the methods by which these lambs were disposed of.

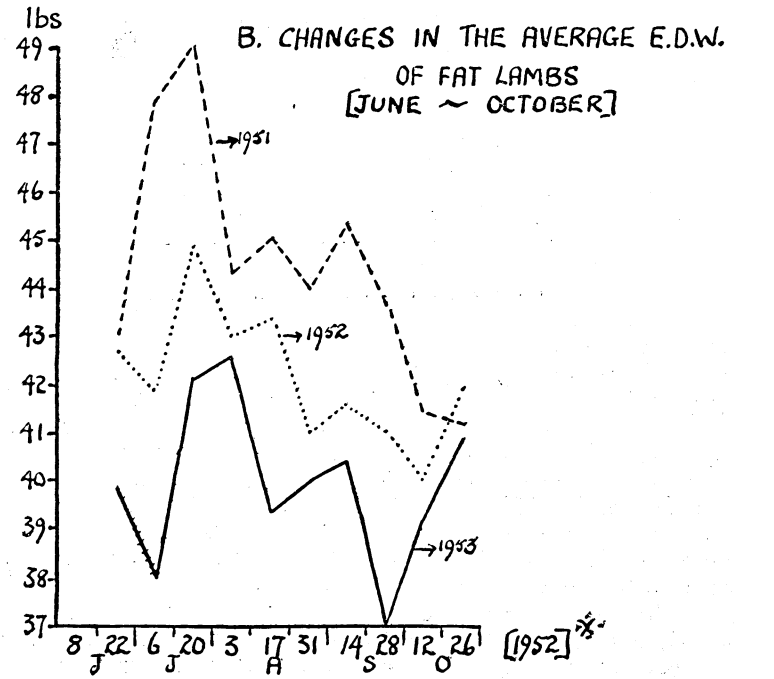
The distribution of the sales of fat lambs, which constituted the biggest source of revenue, is given in Fig. 6A.

Similar results are seen in the histograms for the peak sale period of 1952 and 1953 to those already shown for the whole county in Fig. 3. The histogram for 1951, based on data from an identical sample to that of 1952, has also been included, as it does demonstrate the influence prices have on time of sale and to a lesser extent the influence time of sale has on the weight curve (Fig. B).

The curve showing the changes in the average E.D.W. for 1952 and 1953 shows strikingly similar trends to that shown in Fig. 3.

FIG 6. A DISTRIBUTION OF SALES OF FAT LAMBS IN ANGLESEY [JUNE ~ OCTOBER]





* The correct dates for 1951 are two days after, and for 1953 one day before those given for 1952.

This is particularly true in 1952, but less so in 1953. The average E.D.W. of lambs in 1952 was 41.1 lbs., and in 1953 39.6 lbs. It is seen therefore that the farms in the survey correspond closely in their quantitative data with the county as a whole.

TABLE 13

Disposal of Lambs Produced

	Per cent.	
	1952	1953
Sold fat	83	93
„ as stores..	5	1
„ „ couples	3	—
On hand at end of year	9	6
	100	100

Costs and Returns

Tables 1C and 2C in Appendix C of this report summarise the financial results of the investigation into the economics of fat lamb production in Anglesey during 1951/52 and 1952/53. The cost structures shown in these two tables, of which Table 2C is perhaps the clearer, show that nearly 50 per cent. of the total net cost was attributable to food and grazing. Of this, hand feeding and the feeding of special crops constitutes a very small proportion—in fact, only three farms fed special crops and only five farms fed hand food such as oats, roots and hay. With the exception of one farm, which had high ewe mortality during lambing, the amount of bottle feeding to lambs was insignificant. The cost of direct labour on sheep came to about 50 per cent. of the grazing cost, and of this shepherding accounted for 80 per cent. Depreciation on the breeding flock was only 1s. less than the labour cost in 1951/52, but nearly 5s. less in 1952/53. The purchases of lambs per lamb produced represent purchases on three farms only in both years; the output of lambs from the other farms was all home-reared. The veterinary cost, although shown as only 1s. 8d. for 1951/52 in Table 2C, was a very heavy item on some farms in that year, particularly on those which suffered from a bad outbreak of pneumonia. One farm's veterinary cost for a flock of about 220 ewes was as much as £100.

The value of lamb output in 1951/52 at £5 9s. 4d. represented a margin of £3 2s. 2d. over the net cost (Table 2C), and on adding the value of wool produced from the ewe flock (the Wiltshire cross-bred lamb resembles its sire in having very little wool), valued at 11s. 10d., the average margin per lamb produced stood at £3 14s.

The average price received for wool of the 1952 clip was 4s. 10¼d. (4s. 8d. in 1953), and the average weight of wool produced per ewe clipped was approximately 2½ lbs. in both years.

The margin per lamb produced in 1952/53 was 10s. 7d., higher than in the previous year. This was due to the lower depreciation in the ewe flock, and the higher average value of each lamb sold fat; this latter, in spite of the lower average E.D.W. in 1952/53 than in 1951/52.

As in all investigations in farm management and techniques we find considerable variation as from one farm to another in both the margin per lamb produced and per 100 lambs handled. In 1951/52 the former ranged from a loss of 12s. 7d. to a "profit" of £5 1s., and the latter ranged from minus £52 9s. 1d. to plus £467 9s. 9d. Table 14 gives the frequency distribution of these margins.

TABLE 14

Frequency Distribution of Margins per 100 Lambs Handled and per Lamb Produced, 1951/52.

Margin per 100 lambs handled.	No. of Flocks.	Margin per lamb produced.	No. of Flocks
£450 and over ...	1	£5 0 0 and over	1
£400—£449 ...	4	£4 10 0—£4 19 11	3
£350—£399 ...	9	£4 0 0—£4 9 11	5
£300—£349 ...	8	£3 10 0—£3 19 11	7
£250—£299 ...	1	£3 0 0—£3 9 11	7
£200—£249 ...	2	£2 10 0—£2 19 11	1
£150—£199 ...	2	£2 0 0—£2 9 11	1
Loss ...	1	£1 10 0—£1 19 11	2
		Loss	1
	28		28

It is difficult to pinpoint with any degree of precision the reasons for the variation seen in Table 14, but among others the following seven factors appear to be the most prominent influencing the profitability of sheep farming:

(a) A low ewe mortality.
(b) High lambing percentages.
(c) Low lamb mortality.
(d) A satisfactory weight of lamb at sale.
(e) Date on which lambs are sold.
(f) A high weight of ewe when sold fat.
(g) Correct and efficient use of input resources, particularly those of grassland and labour.

The importance of these factors is fully shown in Table 15, where a comparison is made between the five farms with the highest margin

and the five farms with the lowest margin per lamb produced. In the latter group of farms the farm that made a loss is disregarded as the loss was due almost entirely to the large percentage of barren ewes which failed to conceive at tupping. The five high and five low margin farms had Welsh Mountain ewe flocks and used Wiltshire Horn rams.

TABLE 15
Comparative Data of Five High Margin (HM) and Five Low Margin (LM) Farms 1951/52.

	5 HM. Flocks	5 LM. Flocks	Average 28 Flocks
Number of Lambs Produced	194	114	138
Margin per Lamb Produced	£4 15 3	£2 7 0	£3 14 0
Value of Output per Lamb	£5 18 7	£5 1 6	£5 9 4
	lb.	lb.	lb.
Average E.D.W. of Lambs	43.6	40.6	41.4
Lambs born per 100 Ewes Lambing	120	103	112
Per cent. Losses in Lambs	5.8	8.2	7
Lambs produced per 100 Ewes Tupped	107	78	98
Per cent. Losses in Ewes	7.7	14.3	9
Average E.D.W. of Ewes (lbs.)	44.7	36.4	41.1

The 5 HM. farms had consistently better results in all the measurements given in Table 15 than the 5 LM. farms. They sold heavier lambs and on the face of it had more prolific ewes and a lower mortality rate for ewes and lambs, etc. These results, in combination, ensured a margin per lamb produced double that of the 5 LM. farms. Particular attention should be drawn to the two sets of figures giving the average E.D.W. of lambs and the number of lambs born per 100 ewes tupped or mated.

Many farmers consider the weight of the lambs sold as the sole measure of their success as sheep farmers—and it is often the highest weight obtained which is quoted on enquiry. The average E.D.W. of lambs is admittedly of importance, but the comparison in Table 15 shows that whereas the average E.D.W. of lambs was only 7 per cent. more on the 5 HM. farms, the number of lambs produced per 100 ewes mated was 37 per cent. higher. In other words, the latter measure appears to have greater influence on profitability than the average E.D.W. Looking at it in another way we find that if the 5 LM. farms had increased the number of lambs produced from 78 to the average for the 28 flocks (i.e. 98), without any increase in the average E.D.W., they would have produced 812 lbs. more meat. This is equivalent to an increase in the average E.D.W. of over 10 lbs. per lamb at the then existing production of 78 lambs per 100 ewes mated. The former alternative is far easier to achieve.

The same analysis for 1952/53 again shows essentially the same results as those given for 1951/52.

It is significant that the average E.D.W. of ewes on the LM. farms was far less than on the H.M. farms, as to all appearances these ewes at the beginning of the season were comparable in condition to those on the HM. farms.

The mortality rate of ewes on the sample farms support the estimates calculated on the whole county basis, and it is extremely unfortunate that some farms have death rates of ewes up to 15 per cent. In 1952/53 co-operating farmers were asked to record the period in which ewe deaths took place, and the results from those farms that complied (which were in the majority) showed that 57 per cent. of ewe deaths took place before lambing or in the initial stages of lambing when the lamb also was dead. Thus considerable amounts of productive capacity were wasted and, in addition to the number of lambs produced per 100 ewes mated being reduced, the initial and subsequent costs of these dead ewes were placed on the shoulders of other ewes' lambs.

The lamb mortality in both years appears to be about 7 per cent. of the lambs born. Of these 37 per cent. were dead at birth or soon afterwards, 52 per cent. died in the first fortnight, and the remainder, 11 per cent., died at a later stage (1953).

Summary and Discussion

The foregoing account of the fat lamb industry of Anglesey, based on the "whole county," and sample data, can be summarised as follows:

(a) It has been shown that the sheep industry of Anglesey, based as it is on the " flying flock " principle, is almost wholly engaged in the production of fat crossbred lambs which are fattened on grass alone.

(b) The rapid increase in the sheep population since 1945 and, compared with 1939, the smaller area available for grazing due to greater emphasis on tillage and dairy farming, is creating new problems of management and policy on the Island.

(c) Analysis of the physical data relating to the six collecting centres on Anglesey brought to light the following characteristics of marketing of fat lambs.

1. Approximately 18.7 per cent. of the total sales of fat lambs born in 1952 were graded at 41.7 lbs. E.D.W. during June (24.6 per cent. at 39.5 lbs. in 1953) (i.e., in each case over 1 lb. E.D.W. heavier than the annual average). Many lambs sold after the end of June were of such E.D.W. as to have been more profitably sold earlier.
2. With the resurgence of sales of fat lambs in July the average E.D.W. fell, and this fall continued until the end of the year.

3. The peak sales of fat ewes took place at the beginning of October—the average E.D.W. at this period showing a marked decline to a level which was maintained until the end of the year.

(d) Financial and quantitative data from a sample of Anglesey flocks have been examined. These have shown tendencies already revealed at the collecting centres. They confirmed the suspicion of a high ewe mortality and gave some further indications and measurements of other factors influencing profitability. The most striking of these is that High Margin farms, in addition to selling heavier lambs than those off Low Margin farms, produce far more lambs per 100 ewes tupped.

Losses in sheep take two forms, namely, deaths and the inability to maintain a satisfactory growth rate. Both these types have been found in serious proportions in Anglesey.

Far too many ewes die, and too many of these deaths occur before lambing. This aspect of the Island's sheep farming is attracting considerable attention from veterinary and husbandry experts. It appears that a big proportion of the deaths are due to metabolic disorders which in the case of ruminants are complex in nature and as yet not completely understood. On the farms surveyed twin lamb disease, milk fever and general unthriftiness featured often as the cause of death. Pulpy kidney disease was common on some farms, and in 1952 in particular, enzootic pneumonia accounted for a considerable proportion of deaths.

Many of these ailments can be controlled to a greater or lesser extent by good management and the realization of the paramount importance of good nutrition. " . . . . if the ewe is not in a rising condition during at least the last six weeks of pregnancy, the risk of toxaemia is enhanced, small weakly lambs are foreshadowed, and the ewe will have a poor milk supply"(*Thomson**). Although this observation was directed at twin lambing, Thomson also points out that though less pronounced similar results can occur with single lambs. The ewe must be in a rising condition for about six weeks before lambing, for not only are the chances of survival increased, the birth weight of the lamb is also higher*, thus enabling the producer to start off with considerable advantage. It must be conceded, nevertheless, that difficulties at lambing may result from such treatment, but by and large it is easier to drop a heavy lamb from a strong and healthy ewe than to obtain a lightweight lamb from a weak and undernourished ewe.

It has already been explained that only about 40 per cent. of the ewe flock is replaced every year so that in fact the majority of the flocks contain ewes that, by having grazed on the Island for a year, have become accustomed to the environment. The remainder find themselves in a new environment, different from that which they had

* William Thomson, "Feeding the in-lamb ewe." Scottish Agriculture, Winter 1952–53.

on the hills. Although the sample of the farms surveyed was not large enough for any definite conclusions, indications are that mortality prior to and during lambing was heavier among those ewes spending their second season on the Island. This is an interesting possibility which should be investigated further. It may be the case that the treatment of the second season ewes, which in practice is the same as that given to those newly purchased in, should be different and therefore if appropriate adjustments were made in the management the mortality among such ewes would be reduced.

The other characteristic feature of fat lamb production in Anglesey was the continuous fall in the average E.D.W. of lambs from mid-July onwards. The probable reasons for this are many and varied. The more obvious ones are

(a) Higher number of twin lambs being sold at a later date.
(b) Higher number of late born lambs being sold at a later date.
(c) The fact that the average E.D.W. at the beginning of the season was usually estimated as being up to 2 lbs. above half the live-weight, whereas later in the season it was up to about 2 lbs. less.
(d) Higher incidence of pure Welsh Mountain lambs which were either previously brought to the Island in a store condition and later fattened or were fattened on farms in the part of Caernarvonshire which sends its lambs to Menai Bridge.

The last possibility mentioned would hardly influence the weight curve up to the beginning of October, and as the tendency of the curve to fall is seen in previous months this possibility can be ignored. The first three possibilities are valid as tending to depress the average E.D.W. from July to November. But, nevertheless, the growth rate of those lambs should more than compensate for any such factors. In the first place the period from birth to sale is often longer than in the case of early marketed lambs, and secondly as up to 25 per cent. of the lambs produced were marketed before the end of June one would expect more food to be available and better conditions to exist for those sold later.

On the basis that the above explanations are not sufficient, one is forced to conclude that lambs in Anglesey are not able to maintain a satisfactory growth rate after being weaned and possibly before weaning. It is interesting therefore to speculate as to the real reasons for this falling weight curve.

Worm infestation of lambs increases throughout the late spring and summer, and not until late summer and autumn do the lambs develop partial resistance to the effects of infestation. During this period, when resistance is being built up, infestation again tends to increase until late autumn when a rapid elimination of the parasites occurs.*

* Memorandum on Hill Sheep Farming; Nat. Veterinary Association.
D. O. Morgan, I. W. Parnell & C. Rayski—"Worm infestation in Scottish Hill Sheep"—Scottish Agriculture, Summer 1952.

Since the effects of the initial infestation often coincide with the check the lamb obtains at weaning it is understandable that the subsequent growth rate is retarded. The dosing of lambs against worms —a fairly common practice on many farms—certainly reduces the incidence of the parasite, but it is possible, and indeed probable, that through incorrect timing or application of the treatment some lambs still suffer from losses due to the worms.

The large increase in the proportion of temporary grass to permanent grass which has occurred since 1939 in Anglesey was described at the beginning of this report. The largest proportion of this temporary grass consists of Ryegrass Mixtures. If the sward management is not sound and extremely efficient such ryegrass pastures tend to become "lazy" in the end of July and August. Thus it is possible that together with the check obtained at weaning and worm infestation this fall in the nutritive value of grass (if it is mainly ryegrass) adds another reason for the falling weight curve. Drought or extremely dry conditions would accentuate further the difficulties for a satisfactory growth rate.

Another interesting possibility is that a subclinical deficiency of trace elements, particularly cobalt, may be present in Anglesey. Such forms of the deficiency have been suspected and indeed found to exist in areas where obvious symptoms were not present. Trials are being conducted by many investigators on this aspect of nutrition in many parts of the country. It appears that cobalt deficiency influences the appetite of lambs and experiments have shown that "the increase in the liveweight that occurred when lambs on an unrestricted cobalt-deficient diet received a cobalt supplement must have been due to an increased consumption of food."*

These speculations may contain some of the reasons for the feature which they try to explain. Field tests and experiments alone would find the real reason. The main point is that there are strong indications that growth rates are not satisfactory and if measures could be taken to rectify this they would add considerably to the attractions and profit of sheep farming in the county and increase the output of meat per ewe in the flock.

Marketing

It was seen in Fig. 1 that, compared with 1952 and 1953, an interesting feature of marketing before 1939 was the large percentage of total sales of sheep that took place in May and June. Davies also showed that about 60 per cent. of total output and about 80 per cent. of the total exportable surplus of Anglesey were consigned to Manchester and Salford**. It is highly probable that these markets will again be interested in the sheep output of the county when marketing

* J. Stewart "Cobalt deficiency and appetite of Lambs," Brit. J. Nutr., Vol. 7, No. 3.

** J. Llefelys Davies : Report of the Welsh National Conference on the Breeding and Marketing of Sheep, 1931.

is returned to private operators in 1954. To predict whether the type of lamb preferred in these markets before 1939, that is, the lean carcase characteristic of the Welsh-Wiltshire cross, is still favoured would be difficult, but it is reasonably safe to assume that there will be a premium on early marketed lambs. Housewives are usually prepared to pay more for home-killed lamb early in the season, but there is usually a tendency later to revert to the often cheaper joints of imported frozen lamb. Producers therefore should be ready to take advantage of this feature of the market in May and June.

Professor Nicholls, in a recent article, advocates the early marketing of lambs from a somewhat different standpoint.* He writes: "The early lamb, finished on its dam, is a direct exploitation of a genetic capacity for rapid growth and development of flock . . . . on a high nutritional plane. The cheapest factor contributory to this high plane is that provided in the milking capacity of the dam." He points out further that the success of the production of lamb in New Zealand and Australia is in no small part due to this "cashing in" on the milk yield of the ewe.

This lead deserves consideration from Anglesey farmers. The Welsh Mountain ewe, which is the basis of fat lamb production on the Island, is well known for its good mothering qualities. This has been amply shown in this report in that a high proportion of total sales were effected at an early date at an average weight far higher than the annual average. Earlier lambing would increase the proportion still further, but there are two possible objections to such a policy.

Firstly, the replacement to the flock occurs in September and October, and this prevents the early introduction of the ram to the flock. But since up to 60 per cent. of the flock consists of second season ewes it would be possible to turn the ram to those at an early date and thus obtain two sets of lambs, one in February from the "old" ewes and the remainder in March from the "new" ewes. This proposal would, if adopted, also ensure different treatment to each set of ewes.

The second objection is that weather conditions in the earlier months are not conducive to lambing. On the face of it this is valid, but on examining ten-year averages of rainfall, etc., for the county it is found that whereas February is somewhat colder—which by itself is not very important—it has the same rainfall and, further, the same number of days of heavy rainfall as March. The numbers of sunshine hours and snow days show negligible differences between the two months. Details of wind velocities (which are not available) would be very interesting, as wind-blown rain can cause considerable and serious difficulties at and immediately after lambing. But if we examine the data we find that gales were more common over the ten years in February than in March, though there was little difference

* J. E. Nicholls: "Sheep Farming Problems," J. Royal Agri. Soc. of England, Vol. 113, 1952.

between these two months in the last two years.

The planting of more trees in Anglesey would, to a large extent, eliminate climatological objections to early lambing and would result in considerable benefit to early grazing. Although the Island is extremely exposed to the westerlies, cover belts and woodlands are rare.

To sum up, therefore, earlier lambing would result in the following benefits :

(a) Selling more lambs in a more remunerative market.
(b) Reducing the cost of producing each lamb.
(c) Increasing the rate of turnover of capital in that the grazing from which early lambs have been sold could be used for fattening purchased store lambs or to keep more store cattle.
(d) Lengthening the period during which fat ewes could be sold as the post-weaning period would begin far earlier. This, incidentally, would alleviate the position which is now common in the autumn months, when there is an excessively large intake of animals for slaughter.

In addition, producers will have to bear in mind the importance of quality of both early and late marketed lambs in the years that follow. There is a tendency for the area of tillage to decrease in Anglesey. If this is not stopped and reversed there is an imminent danger of the pastures deteriorating to the conditions common before 1939 and becoming "sheep sick." The extensive use of the plough in renovating pastures, in addition to maintaining the health of the sheep, would help to ensure more satisfactory growth rates. Investigation and field tests of the use of rape and seeds mixtures would be very valuable, as also would be the trying out of a variety of grass seed mixtures and the assessing of their influence on fat lamb production.

It is hoped that this report has crystalised and given precision to the ideas that are already in the minds of many who are intimately concerned with the farming of the county of Anglesey. As it is based on only two years' data and results, the report lacks much conclusive evidence, but such evidence as is presented is sufficient to show the nature and extent of the many problems associated with sheep farming in Anglesey. It is possible that it may assist in indicating directions in which further research and investigation could be pursued, and it has drawn attention to the need for more co-operation between specialists who could pool their knowledge and experience. Furthermore, it has shown that information derived from sources from which this report has drawn freely can give valuable assistance to the administrator, adviser and researcher.

It is extremely important that farmers should realize the value of detailed and accurate records relating to their sheep enterprises and indeed their whole farms. Such records, when intelligently applied, can be an invaluable aid to the good management of the farm; they

can assist immeasurably in showing the results the farmer is achieving and in budgeting the future allocation of resources; they help the farmer to realise the purpose of his efforts, and they also bring to light many aspects of husbandry and management that otherwise would remain hidden or not fully understood. To revert to the sheep enterprise, one Anglesey farmer who co-operated in the investigation was heard to say: "Had I not kept these records I would never have believed that I lost 21 lambs at lambing—my guess would have been about 8 or 10."

Aberystwyth. *March*, 1954

APPENDIX A.

TABLE 1A.

Land utilization and Number of Farms in Size Groups 1953.

Size Group (acres)	No. of Farms	Land Utilisation (acres)				Number of Livestock (1st Nov., 1952)			
		Cereals	Roots	Rape &K'le	Total Acres	Cows& Heifers in milk & Dry	Other Cattle over 2 yrs.	Calves	Sheep Ewes
Up to 50 ...	1	—	—	—	23	—	5.0	—	67.0
51—100 ...	4	11.3	—	4.0	79.5	11.0	13.8	6.5	98.0
101—150 ...	6	14.6	2.5	4.2	124.2	9.2	37.2	4.2	151.8
151—200 ...	8	22.8	0.9	3.5	179.8	9.3	34.5	9.1	154.3
201—250 ...	3	30.8	1.3	12.8	210.3	16.3	32.3	11.3	206.0
250 & over ..	5	54.0	—	4.8	320.0	15.2	36.2	16.4	215.0
All Farms...	27	27.2	1.0	5.1	198.1	11.0	31.0	8.9	159.1

TABLE 2A.

Distribution of the sizes of ewe flocks on 1st November, 1952

Size Groups (Ewes)	Number of Flocks	Average No. in Flock
Up to 50	1	45.0
51— 75	3	63.0
76—100	2	83.5
101—125	7	117.6
126—150	3	134.3
151—175	2	162.5
176—200	2	178.5
201—225	2	216.5
225 and over ...	5	305.6
All Farms ...	27	159.1

TABLE 3A.

Frequency Distribution of Margins per 100 Lambs and per Lamb produced 1952/1953.

Margin per 100 lambs handled.	No. of Flocks	Margin per lamb produced.	No. of Flocks
£500 and over ...	2	£5 10 0—£5 19 11	1
£450—£499 ...	4	£5 0 0—£5 9 11	4
£400—£449 ...	4	£4 10 0—£4 19 11	2
£350—£399 ...	8	£4 0 0—£4 9 11	8
£300—£349 ...	3	£3 10 0—£3 19 11	5
£250—£299 ...	5	£3 0 0—£3 9 11	4
Under £250 ...	1	£2 10 0—£2 19 11	3
	27		27

TABLE 4A.

Comparative Data of 5 High Margin (HM) and 5 Low Margin (LM) Farms 1952/53.

	5 H.M. Flocks	5 LM. Flocks	Average 27 Flocks
No. of Lambs produced	190	112	162
Margin per lamb produced	£5 2 1	£2 17 11	£4 2 7
Value of output per lamb	£6 1 3	£5 5 9	£5 13 8
Average E.D.W. of lambs	42.6 lb.	37.6 lb.	39.6 lb.
Lambs born per 100 ewes lambing ..	115.3	103.0	111.7
Per cent. losses in lambs	5.5	9.4	6.6
Lambs produced per 100 ewes tupped..	97.8	83.5	95.2
Per cent. loss in ewes	5.7	7.8	6.9
Average E.D.W. of ewes	44.2 lb.	40.3 lb.	41.8 lb.

APPENDIX B.

TABLE 1B

Changes in the Number of Cattle in Anglesey.*

1939—1952

Year	Cows and Heifers in-milk and in-Calf	Bulls for Service and for Rearing	Other Cattle over 2 Years		Other Cattle 1—2 Years		Calves
			Male	Female	Male	Female	
1939	14,463	318	10,017		13,363		11,900
1940	14,199	312	7,714	2,507	7,055	5,138	11,656
1941	14,739	342	7,187	2,282	7,335	4,874	12,101
1942	15,573	384	7,042	2,107	6,200	5,333	11,400
1943	16,925	441	7,638	2,139	5,530	5,419	12,183
1944	18,113	458	8,267	2,567	5,348	6,332	13,278
1945	17,805	481	8,984	3,674	6,099	6,952	12,730
1946	18,763	500	9,540	3,745	6,148	6,526	10,675
1947	18,764	517	9,453	3,719	5,521	5,635	10,157
1948	20,329	546	9,052	3,779	4,206	5,089	13,186
1949	20,507	493	8,830	4,008	5,178	6,353	12,685
1950	19,974	490	8,658	4,172	5,618	6,100	12,291
1951	18,375	408	8,612	4,193	5,385	5,915	10,291
1952	19,150	388	9,197	4,456	4,888	4,825	11,216
1953	19,447	380	9,615	4,732	5,823	6,101	14,160

TABLE 2B.

Changes in the Number of Sheep in Anglesey.*

1939—1952

Year	Rams	Ewes for Breeding	Two Tooth Ewes	Other Sheep 1 year old and over	Ram Lambs	Other Sheep under 1 year old	Total Sheep over 1 yr. old
1939	2,280	90,396	2,521	3,053	1,341	79,468	98,250
1940	2,695	76,245	3,881	6,919	1,247	79,988	89,740
1941	1,552	54,966	1,173	6,044	857	57,486	73,735
1942	1,204	38,754	573	2,099	444	42,236	42,630
1943	904	31,957	1,940	1,730	688	36,540	36,531
1944	946	31,876	1,817	2,237	457	36,359	36,876
1945	933	35,771	713	1,991	760	37,412	39,408
1946	1,087	39,046	1,250	1,960	669	40,721	43,343
1947	1,213	33,979	3,385	5,687	1,240	39,733	44,264
1948	1,072	38,641	1,315	2,739	992	42,563	43,767
1949	1,151	41,729	1,106	3,189	1,009	46,508	47,175
1950	1,242	46,595	1,263	3,216	1,032	49,083	52,316
1951	1,358	49,831	2,036	5,082	1,162	56,125	58,307
1952	1,594	58,759	2,479	6,328	1,157	66,945	69,160
1953	1,855	72,841	1,585	6,376	1,114	78,490	82,657

* Ministry of Agriculture and Fisheries—June 4th Agricultural Returns.

TABLE 3B.

Changes in Land Utilization in Anglesey.*

1939—1952

'000 Acres.

Year	Crops and Fallow	Temporary Grass			Total Arable	Permanent Grass.			Total Crops & Grass (1)
		For Mo'ing	For Grazing	Total		For Mo'ing	For Graz'g	Total	
1939	14.6	11.9	6.0	17.9	32.5	22.5	82.2	104.7	137.3
1940	24.6	12.2	7.0	19.2	43.9	22.1	70.7	92.8	136.7
1941	41.0	12.7	5.8	18.4	59.4	17.1	57.9	75.0	134.4
1942	49.8	13.6	5.0	18.5	68.3	13.9	51.4	65.3	133.7
1943	51.9	13.8	6.6	20.4	72.3	14.5	46.7	61.2	133.5
1944	48.4	14.7	9.4	24.0	72.4	12.2	48.8	61.0	133.4
1945	42.3	14.0	11.6	25.6	67.9	14.1	51.8	65.9	133.8
1946	37.1	14.3	11.4	25.7	62.8	13.7	58.1	71.7	134.5
1947	34.9	16.1	11.3	28.4	63.3	14.7	55.8	70.5	135.0
1948	36.4	15.4	12.0	27.4	63.5	13.8	56.5	70.2	133.7
1949	35.2	14.7	11.2	25.9	61.1	14.1	59.3	73.4	134.5
1950	36.1	13.6	12.5	26.1	62.2	15.3	57.7	73.0	135.3
1951	29.0	14.4	11.9	26.4	55.3	17.1	62.7	79.8	135.2
1952	27.5	16.7	15.1	31.9	59.4	15.7	59.3	75.0	134.4
1953	25.6	15.2	11.2	26.4	52.0	16.1	66.1	82.2	134.7

(1) Excluding Rough Grazing which varied from approximately 23,000 to 26,000 acres.

TABLE 4B.

Ratio of Sheep and Grazing Land*

Year	Number of Sheep over 1 year old	Acres of Temp. & Perm. Grazing Land	Sheep per Acre.	Year	Number of Sheep Over 1 year old	Acres of Temp. & Perm. Grazing Land	Sheep per Acre
1882	20,428	84,339	0.24	1935	86,260†	83,807	1.03
1890	33,364	80,873	0.41	1940	89,740	77,697	1.15
1895	30,962	83,149	0.37	1945	39,408	63,437	0.62
1900	44,205	87,008	0.51	1946	43,343	69,466	0.62
1905	43,865	82,702	0.53	1947	44,262	68,096	0.65
1910	49,098	82,525	0.59	1948	43,767	68,485	0.64
1915	64,230	82,508	0.78	1949	47,175	70,524	0.67
1920	35,049†	73,274	0.48	1950	52,316	70,211	0.75
1925	60,074†	82,529	0.73	1951	58,307	74,635	0.78
1930	76,101†	81,846	0.93	1952	69,160	74,467	0.93
				1953	82,657	77,333	1.07

* Ministry of Agriculture and Fisheries June 4th Agricultural Returns.

† 0.6 of Total Rams and Ram Lambs allocated to sheep over 1 year.

APPENDIX C.

Fat Lamb Survey (Anglesey)
1st November—31st October

1C. Sheep Account.

	Per 100 Lambs Handled.	
	For 28 Flocks	For 27 Flocks
	1951/52	1952/53
	£ s.	£ s.
Opening Valuation	333 14	352 1
Purchases of Sheep	206 18	216 6
Hand-fed Foods	2 2	3 9
Grazing...	94 15	91 5
Special Crops	1 13	3 13
Direct Labour on Sheep	47 17	49 1
Veterinary and Medicines	7 15	4 8
Miscellaneous Costs	9 1	10 5
Total (A)	703 15	730 8
Sales of Sheep and Lambs	601 18	635 13
Sales of Wool	55 11	57 12
Closing Valuation	394 15	422 9
Total (B)	1052 4	1115 14
Margin (Difference between A and B) ...	348 9	385 6
No. of Lambs handled per Farm	147	174

N.B.—"Lambs Handled" include all lambs on hand on 1st November, 1951, all lambs born alive and lambs purchased.

2C. Average Costs and Returns per Lamb Produced.*

	1951/52 Average for 28 Flocks.	1952/53 Average for 27 Flocks.
Costs :	£ s. d.	£ s. d.
Purchases of Lambs	0 3 4	0 3 0
Foods : Grazing	1 0 2	0 19 6
Roots and Kale	0 0 4	0 0 9
Rape	0 0 4	0 0 9
Hay and Oats	0 0 1	0 0 1
Direct Labour on Sheep	0 10 2	0 10 6
Veterinary and Medicines	0 1 8	0 0 11
Miscellaneous Costs	0 1 11	0 2 2
Add Depreciation on Breeding Flock ..	0 9 2	0 5 9
Total	2 7 2	2 3 5
Deduct Appreciation on Breeding Flock ..	—	—
Total net Cost per Lamb	2 7 2	2 3 5
Returns :		
Value of Lamb Output...	5 9 4	5 13 8
Value of Wool produced	0 11 10	0 12 4
Total Return per Lamb	6 1 2	6 6 0
Average Margin per Lamb	3 14 0	4 2 7
Average Deadweight per Lamb	41.4 lb.	39.6 lb.

* "Lambs Produced" included all lambs sold, together with those on hand on 31st October, 1952.

APPENDIX D.

FIG 7A. FORTNIGHTLY CHANGES IN THE AVERAGE E.D.W. OF FAT LAMBS 1952 AND 1953

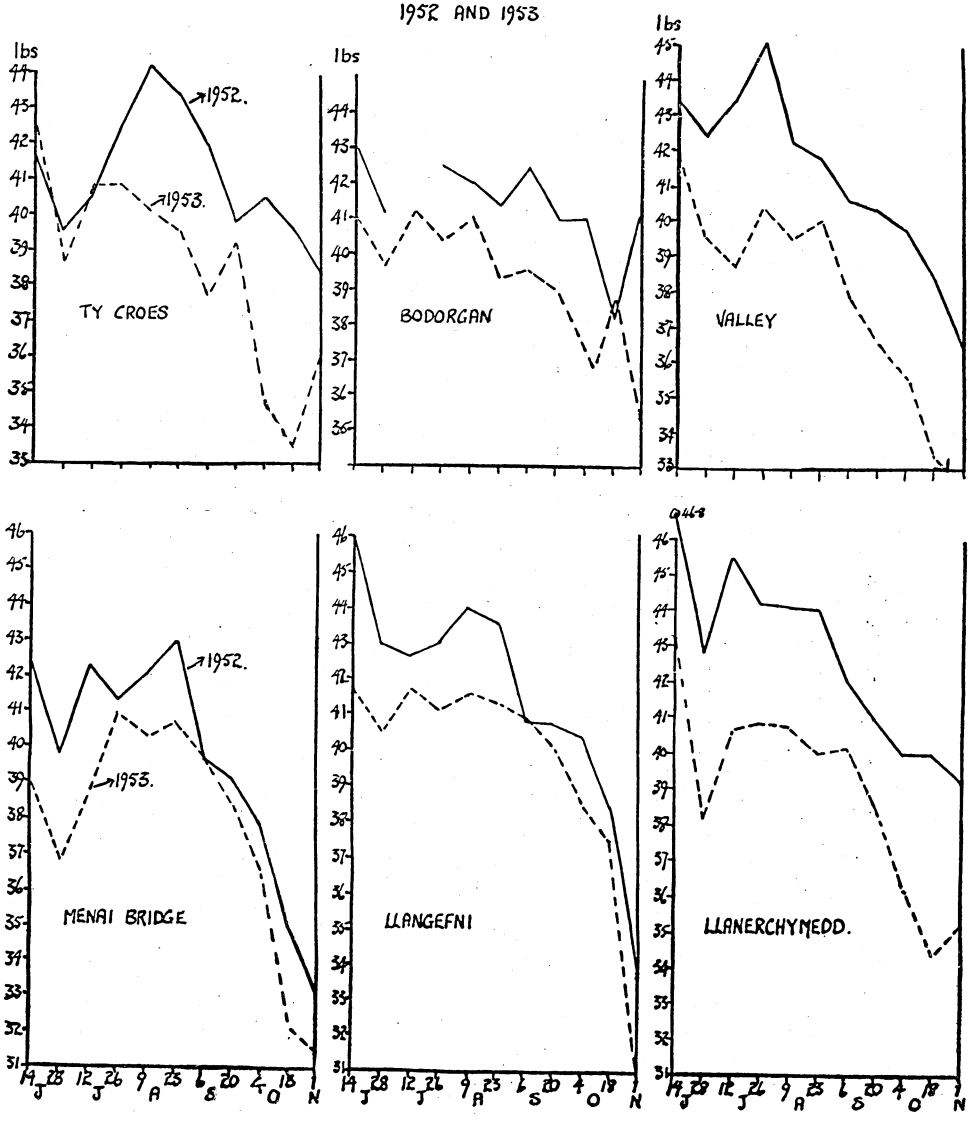
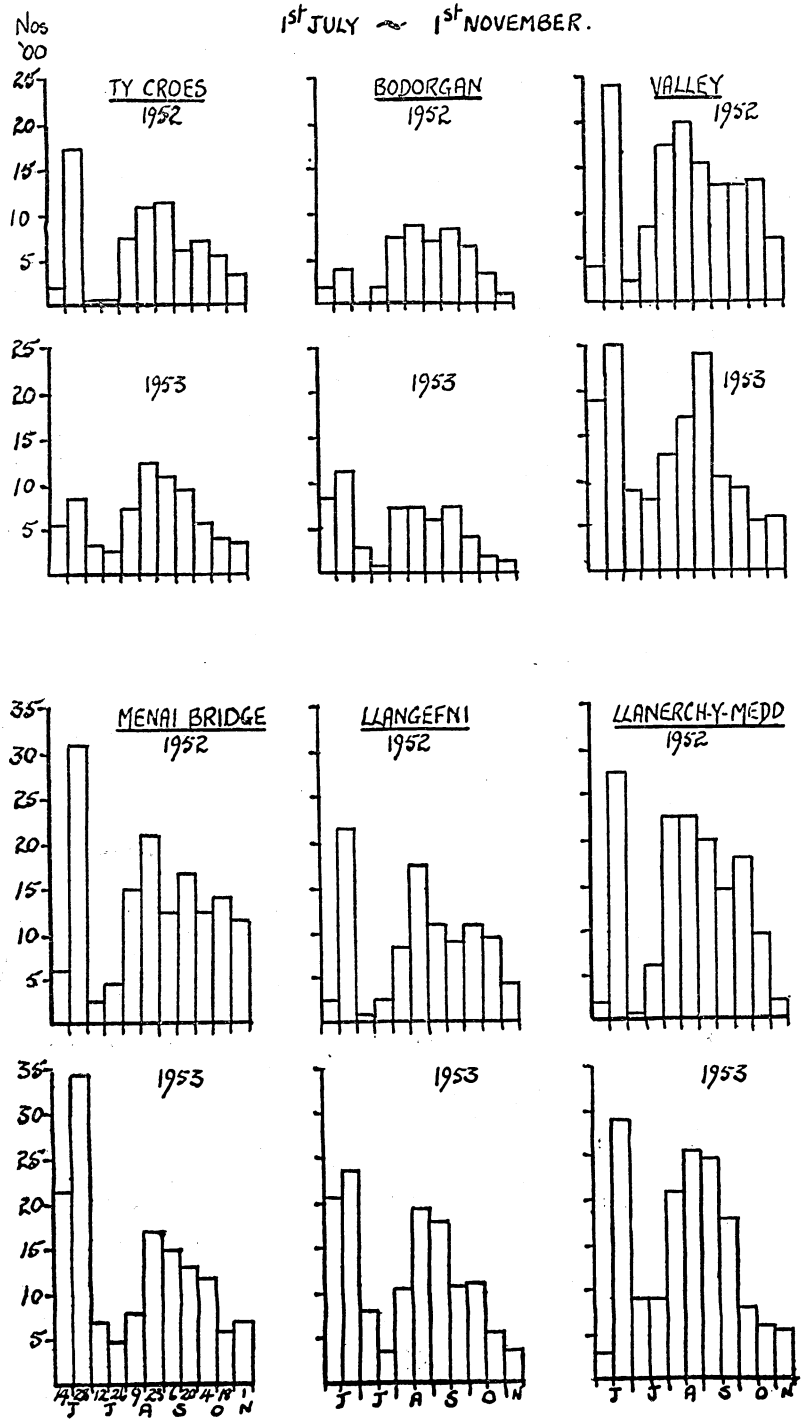


FIG. 7.B FORTNIGHTLY SALES OF FAT LAMBS - 6 CENTRES
1st JULY ~ 1st NOVEMBER.



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