STOCK-RAISING FARMS IN AN UPLAND AREA IN WALES: SOME ECONOMIC CONSIDERATIONS AND RESULTS.

by

J. R. E. PHILLIPS, M.A.,

Department of Agricultural Economics,

University College of Wales,

Aberystwyth.

1948.

PRICE: ONE SHILLING.

The chief forms of agricultural production in any particular area, and the intensity with which they may be pursued, are broadly determined by elevation, climate, soil, topography and water resources, and natural vegetation, although the limitations imposed by these physical conditions have lost a certain amount of their rigidity with progressive improvements in the agricultural sciences. Thus advances in plant breeding have enabled a wider range and improved varieties of crops and grasses to be grown, thereby allowing a greater head of livestock to be kept, with possibly some modifications in the specific purposes for which they are maintained. These improvements, along with those effected by the application of the results of research in soil science and of other branches of agricultural investigation have served to intensify, and to a certain extent to widen the range of possible uses to which given areas of land may be placed. In general, however, there is wider range in choice of enterprise on farms situated at the lower than at the higher elevations, the influence of advances in technical knowledge under the latter circumstances being more in the nature of permitting somewhat greater intensification of existing forms of production than of allowing opportunity for radical change in the kinds of agricultural pursuits. Economic circumstances, such as concentrations of urban population and ease of accessibility to markets, also exert an influence on production policies. On somewhat similar tracts of upland country with little or no industrial activity, a fairly uniform system of farming is likely to be found.

Such is the case over considerable parts of Brecon and Radnor. The physical features of these two contiguous counties are dominated by an upland massif which slopes generally to the south and east. While the land does rise sharply in certain parts to form well-defined heights, the contours are on the whole uniformly high, thus giving rise to rolling hill country rather than to the serrated peaks and deep valleys characteristic of certain parts of the North Wales mountain system. Fifty-six per cent of the land area of these two counties lies above the 1000-foot contour line, and 95 per cent is above 500 feet, the comparatively few areas situated at lower elevations being found in the river valleys, chiefly those which open out towards the English border. The rock outcrops belong mainly to the Primary series, much of Brecon and a small part of Radnor consisting of Devonian (old Red Sandstone) formations which give a light to medium sandy loam soil. Where not too light these soils are very fertile. Some Carboniferous measures are found in the southern extremities of Brecon; but the remaining rocks are in the main of older origin than these, and have weathered into a variety of soil types, from the peaty and clayey soils of much of North West Radnor, heavy and difficult of working, to the narrow belt of limestone in the southern part of Brecon with its shallow porous soil and sparse vegetation. Rainfall is closely related to relief so that it is on the whole heavy, being upwards of 80 inches per annum on the higher ground in the north, west and south, and falling to 30-35 inches in certain of the lower regions in the east. Altitude, of course, also exerts a moderating influence on temperature, while cloud cover is more frequent and general in upland areas. The net effect of these combinations of circumstances is to mark off Brecon and Radnor as a stock-raising area. The rearing of cattle and of sheep, therefore, constitute the most important enterprises, with greater emphasis on the latter as altitude increases. Tillage crops are for the most part grown for stock-feeding, although there is quite an appreciable amount of grain sold off the larger farms in the

more fertile districts. In fact the precipitation is sufficiently low in a few limited rain shadow areas in southern Brecon to enable pedigree strains of grasses to be grown for seed, despite the high elevation. During recent years a certain amount of dairying has also infiltrated along the lower-lying valleys, chiefly those of Brecon, a fact which serves to show that, where there is sufficient economic incentive and some mitigation in the natural environment, farming systems are by no means immutable. Nevertheless, the introduction of such specialised enterprises in limited areas does not alter to any appreciable extent the traditionally pastoral character of the agriculture of Brecon and Radnor.

This is borne out by the land utilisation and the numbers and classes of livestock carried.

	Brecon.		Radnor.	
	1939.	1946.	1939.	1946.
	%.	%.	%.	%.
Tillage	9.9	30.1	11.8	25.9
Rotational Grasses	9.3	20.4	12.7	20.6
Total Arable	19.2	50.5	24.5	46.5
Permanent Pasture	80.8	49.5	75.5	53.5
Total Cultivated Area	100.0	100.0	100.0	100.0

In 1939 tillage crops represented a very low proportion of the total cultivated area in both counties and consisted chiefly of oats, although fairly substantial acreages of roots were also grown. Rotational grasses amounted to somewhat similar proportions, making the arable about one-fifth and one-fourth of the total cultivated area in Brecon and Radnor respectively. Thus the greater part of the cultivated area consisted of permanent pasture, chiefly of the Agrostis type. But the so-called rough grazings represent the greatest single category of agricultural land, being about equal to the total cultivated area in Radnor, and representing about 60 per cent of the total land in agricultural and pastoral uses in Brecon. The most abundant types of pastures on these rough areas and hill grazings are Molinia and Nardus. From 1939 onwards the exigencies of war demanded an increase in the arable acreage, with the result that permanent pasture declined to roughly one-half of the total cultivated area in both counties. Yet this was achieved while at the same time increasing the numbers of the chief classes of livestock.

The following figures provide an indication of the changes in the livestock position.

Percentage Change in Numbers of Livestock Between 1939 and 1946.

	Brecon.	Radnor.
Breeding & Milking	+ 11.3	+ 4.3
Rearing and Feeding	+ 9.3	+ 1.7
Total Cattle	+ 11.0	+ 2.6
Sheep	+ 2.5	+ 6.1
Pigs	- 46.0	- 31.1
Poultry	- 14.8	+ 4.9
Horses	- 27.3	- 29.3

Numbers of dairy cattle and of rearing cattle increased in both counties, particularly in Brecon. Increases in numbers of sheep, on the other hand, were more marked in Radnor. The decreases in numbers of pigs and poultry were rather to be expected, and were in conformity with the principles of livestock production adopted during war-time. Numbers of poultry in Radnor showed some considerable reductions in the years immediately following the outbreak of war, but from 1943 onwards flock-masters continued to build up their stocks again, and by 1946 these had exceeded the 1939 population. Owing to the difficult nature of much of the land in these counties a large proportion of the farms had originally to keep a heavy complement of horses. With increasing mechanization, however, farmers were able to dispose of quite a number of them. Consequently the decrease in the horse population has been substantial.

Livestock Carried in 1946.

	Brecon.		Radnor.	
	Per 1000 Acres of Total Cultivated Area.	Per 1000 Acres of Total Land in Agric. and Pastoral Uses.	Per 1000 Acres of Total Cultivated Area.	Per 1000 Acres of Total Land in Agric. and Pastoral Uses.
Breeding & Milking	130.2	65.5	83.4	47.9
Other Cattle	168.6	84.9	167.3	96.3
Total Cattle	298.8	150.4	250.7	144.2
Sheep	3794.2	1910.0	2665.2	1533.5
Pigs	28.5	14.3	20.7	11.9
Poultry	1134.1	570.9	1400.3	805.6
Horses	47.9	24.1	39.5	22.7

An indication of the intensity of stocking is provided by the above tabular statement, which illustrates the concentration on cattle and sheep.

	1946. Brecon.	Radnor.
	%	%
Breeding and Milking	44	33
Rearing and Feeding	55	66
Bulls and Bull Calves	1	1
	100	100

Of particular interest is the constitution of the cattle herds. Both counties, particularly Radnor, show remarkably high proportions of rearing cattle in relation to dairy cattle, and these relative proportions are practically unchanged since 1939.

The constitution of the sheep flocks in Brecon and Radnor also possesses certain distinctive features. There has for some considerable time been a change of emphasis from the production of mutton and wool to that of fat lamb, with a consequent decline in numbers of wethers and an increase in the breeding flock. This movement has proceeded furthest in the lowland counties, such as Carmarthen, and is least marked in the two counties under review.

Ratio of Sheep over one year old and Sheep under one year old, per 100 Ewes.

	Brecon.		Radnor.		Carmarthen.		Wales and Monmouth.	
Year.	1+*	1-ϕ	1+*	1-ϕ	1+*	1-ϕ	1+*	1-ϕ
1893	109	81	113	92	48	100	81	90
1903	87	90	94	101	22	100	58	92
1913	78	84	90	92	22	92	53	85
1923	65	88	74	97	15	95	39	90
1933	47	86	54	94	10	89	24	85
1939	23	95	32	112	4	94	11	93
1946	29	95	33	106	6	102	14	91

This may be seen from the above statement, which is based on the data provided by the official agricultural census taken on 4th June of each year. While the general trend in the ratio of wethers to ewes is unmistakably downwards there does seem to have been a slight check in this movement during the war period. Numbers of sheep under one year old in relation to size of ewe flock have not shown any appreciable change, although it may perhaps be reasonable to suppose that there was much more early lamb production during the later than the earlier

* "Other Sheep" over one year old as % of Breeding Ewes.

ϕ "Other Sheep" under one year old as % of Breeding Ewes.

years and that a certain proportion of lambs would be sold off before being recorded in the official returns on 4th June. But this assumption would not apply to any great extent to Brecon and Radnor, where the tendency is to keep the wether lambs on to the late summer and autumn or even the opening months of the following year. Since 1939, moreover, it has not been in the national interest to market spring lamb at too early an age, and the system of payment has been modified to encourage the making of heavier weights.

In general, the farming system practised in Brecon and Radnor is an extensive one and it is natural that the size of farms should be somewhat larger than in areas which practise a more intensive form of production. In fact, the average sizes of the holdings in these two counties are larger than those for the remainder of Wales. Excluding holdings of less than 5 acres, the average for Brecon works out at about 73 acres and that for Radnor at about 80 acres. The corresponding figure for Wales would be in the region of 54 acres. In Brecon upwards of one-half and in Radnor about two-thirds of the total acreage under crops and grass is found on farms of 100 acres and above, as compared with about 47 per cent for Wales as a whole. This fact must be borne in mind when the economic results for farms of different sizes are considered.

The data on which this study is based refer to 48 farms for the year 1945. These are distributed fairly evenly throughout the two counties, and in view of certain diversities in natural conditions within the area, to which attention has already been drawn, it is only to be expected that they should exhibit varying levels of production. But while they may differ from each other as regards intensity of production, they constitute a uniform sample from the standpoint of the general system of farming followed. The farms vary in size from 50 to 783 acres, and average 192 acres. In view of this wide range it has been thought advisable to group them on an acreage basis. Particulars of cropping, of numbers of livestock carried, and of the labour complement are available, in addition to information of a financial nature. It must be emphasised, however, that the farms in the present sample are almost certain to be somewhat better than the aggregate of farms in the counties as a whole, and that the financial results here presented probably err on the favourable side. But the main preoccupation of this study is not so much with the actual levels of income of the farms under review as with their chief organisational features, although it is realised that these two factors are by no means unrelated. The Tables given in the Appendix, however, provide information on both the financial and general economic aspects of the farms.

Livestock production constitutes the cornerstone of the farming economy and the land utilisation has been planned accordingly. During the year in question there was a certain amount of direction and control of cropping by the County War Agricultural Executive Committees, as they were then termed, and the main changes effected thereby on a county basis have already been noted. While considerable increases were achieved in crops for direct human consumption, the greater part of the cultivated area was still devoted to the growing of fodder crops. Small acreages of wheat were recorded in all groups, about three-fifths of the farms in the sample growing this crop (see Tables I and II). Specific acreages were also laid down for potatoes, but sales were not heavy on these particular farms. Barley

was of somewhat greater importance, especially in the largest-sized group where quite appreciable amounts were grown for sale. The most important cereal crop grown, however, was oats, which accounted for between 43 and 48 per cent of the tillage area in the various groups. Kale and/or cow cabbage were grown on only ten farms throughout the entire sample. But mangolds, turnips and swedes, and rape featured in the cropping schedules of all the farms, and in the larger groups their acreages were quite substantial. The wether lambs may be fattened off the rape, while they may also be turned in to the root fields. Rape also served as a nurse crop for "seeds" on many farms in the present sample, particularly those situated at the higher elevations. Temporary grass as here defined refers to first-year "seeds" only and the high proportions which were grazed are very apparent. In fact it is the practice, especially in parts of Breconshire, to graze the new ley, thus delaying the taking of a hay crop until the second year. Hay is also an important fodder crop on these farms, and the general tendency for the area thus utilised to be relatively greater on the smaller farms is plainly shown. Rough grazings ranged from about one-fifth to upwards of one-third of the total acreage throughout the different groups. Many of the these farmers, however, were reducing their area of rough land by ploughing and using rape as a pioneer crop.

Average numbers of the chief classes of livestock in the various size groups are set out in Tables III to V, and the special emphasis on cattle and sheep is clearly seen. Moreover, sheep seem to increase in importance relatively to cattle with increasing size of farm. Pigs are of minor importance; they are most numerous on farms in the smallest-sized group, and thereafter do not exhibit any trend whatsoever. Neither do numbers of poultry move in any particular direction, the size of flock on individual farms possibly depending to a considerable extent on the inclinations of farmers' wives. Total numbers of horses, on the other hand, increase with increasing size of farm, although work horses do not show a regular increase, the numbers in this category on individual farms being influenced by such factors as ease of working the land, possession of a tractor, and dependence on contractors' services.

The cattle and sheep enterprises, however, merit further observation, on account both of their importance in this type of farming and of the variations in systems of management which exist within each.

Methods of rearing for beef production have shown less departure from the natural way than those for dairying, and the traditional method is probably more in evidence in Brecon and Radnor than in most areas. Even so, innovations first introduced by the smaller farmers have gradually gained ground and are now fairly widespread. The cattle are chiefly of the Hereford breed and calving takes place in April or May. It occurs chiefly while the cows are out on grass, or as near as possible to the times of turning out. The calves run with their dams throughout the summer months and receive no supplementary feeding until they are weaned and housed in October or November. Each cow therefore merely rears its own calf; and, while this makes for relatively little care and attention during the calf period, the maintenance of a cow for the production of just one calf per annum is not so economical a method as may at first appear. It is essentially an extensive system, with a low rate of turnover of capital, and suitable for the

larger farms on second class land. Fully three-quarters of the farms in the present sample were practising the "one calf per cow" system, although in some cases the calves were kept indoors and the cows brought in twice daily to be suckled. The pure-bred Hereford is, of course, a poor milker, yet the commercial strains found on many of these farms did possess somewhat better milking qualities.

More particularly on the smaller farms was there a tendency to arrange for calvings to take place rather earlier in the year and for cows to suckle their own calves for four months or so after which the latter were weaned and put on to dry food and additional calves were bought in and suckled until October or November. While this method serves to increase the rate of turnover it also increases demands on labour, while the feed position does not enable it to be adopted in all cases. In yet other instances calves were pail fed. Some farms in the present sample, moreover, which were adjacent to dairying districts had changed over to Shorthorns or Shorthorn/Hereford cows while continuing to use a Hereford bull, and the calves sold out as one and a half to two year old stores. In addition a number of Shorthorn heifer calves would be purchased and reared for eventual sale as dairy stores. In general, however, bullocks reared on farms were mainly disposed of at 14-18 months and the heifers as two year olds. No winter fattening was practised but appreciable numbers were finished off the grass on some farms.

Some of the herds in the sample were self contained, while quite a number of farmers bought in calves for rearing. Others, however, increased their rate of turnover by buying in stores during the spring months for sale in the autumn. A few made purchases in the autumn, but, as already indicated, the feed position is the limiting factor in adopting such a practice. But even during peace-time there was no very great dependence on purchased feedingstuffs. The cows were fed on chaffed straw, a little hay, and roots, with probably some addition in the hay ration and the introduction of oat sheaves with the approach of calving time. The store cattle, especially those intended for sale in the spring, would receive a somewhat more uniform diet during the time they were housed, including some crushed oats.

The sheep enterprises on these farms also present many variations, both as regards breeds kept, and age and condition at sale. On land above the 2000-foot contour line the Welsh Mountain, with possibly one exception in a limited area in south Breconshire, is the only breed found, and even on land above 1500 feet its supremacy is not seriously disputed. On upland tracts ranging up to 1500 feet, however, which comprises such a large proportion of the land area in these two counties, various admixtures with other breeds, mostly of local origin, have occurred. In fact, such crosses have been made wherever it has been found possible to carry a heavier type of sheep. Thus over parts of Radnor and Brecon Welsh ewes have been mated with a Kerry ram, and two or three generations hence become what are known locally as "Kerry Crosses". In other cases Cluns are used for crossing purposes. The Radnor breed, although now not so important numerically, is found on a limited number of farms in the present sample. In yet other instances Radnor ewes are crossed with a Clun ram. In certain parts of Breconshire, particularly on the Old Red Sandstone formations, Cheviot blood has been successfully introduced, and constitutes the exception to the predominance of the Welsh Mountain breed at

the higher elevations noted above. On the somewhat lower land in this area flocks are mated with rams of other breeds, such as Ryeland, Shropshire, and the Clun Forest. The latter cross has found considerable favour during recent years as it produces a rather heavier lamb. Lastly, on land of low to medium elevation pure line flocks of Kerrys, Cluns and other lowland breeds are found.

Sales of sheep are made up of combinations of prime draft ewes, cull ewes, store and fat lambs, and wethers. Many of the Radnorshire farms in this sample which were situated at the medium and higher elevations adopted a flying flock system and ewes were drafted out as two-year olds, purchases of Welsh or Kerry Cross ewes being made to maintain type. Some of the best lambs might be sold out as forward stores and the remainder kept on to the end of the year, or even the following spring, and fattened on rape and hardy green turnips. The few farms in the sample which kept Cluns were also selling out prime draft ewes, chiefly after their first lamb crop, and depending to some considerable extent on the ewe lambs for flock maintenance, which speaks well for the fecundity of the breed. On the Breconshire farms, however, the ewes were generally drafted out as three or four year olds.

The importance of these two enterprises in the general farming economy of the farms under review is reflected in Table VI, which sets out the average capital invested in the different classes of livestock and in implements. Over the whole sample cattle and sheep together constitute two-thirds of the capital invested per farm, and range from 61 per cent in Group I to 72 per cent in Group V. No useful purpose would be served by itemising the valuations of the different kinds of implements and machines. About one-half of the farms had tractors; these were chiefly the larger holdings.

The foregoing observations on land utilisation, numbers and types of livestock carried, and capitalisation provide an indication of receipts, the chief items and total values of which are given in Table VII. Crop sales, while increasing with size of farm, are not of very great importance in any of the size groups. They consist chiefly of wheat and some potatoes, although barley is an important element on some of the larger farms.

Over all farms receipts from sheep and wool are greater than those from cattle, particularly in the two largest groups.

Sales of Sheep and Wool.

	Av.Price per head (£'s).	Percentage Distribution.	
		Value.	Numbers.
Rams	6.34	2.2	1.2
Ewes with Lambs	4.00	-	-
Ewes	3.80	29.6	28.2
Fat Sheep over one year	2.75	6.0	7.9
Fat Sheep under one year	3.15	39.4	45.4
Store Sheep over one year	3.01	2.3	2.7
Store Sheep under one year	2.76	11.1	14.6
Wool	-	9.4	-
Total	-	100.0	100.0

It will be seen from the above statement that fat lambs are the most important class of sheep sold both numerically and by value. Store lambs are on the whole of much less importance, although there is great variation within the different size groups, the figure being as high as 25 per cent of numbers of sheep sold in the smallest group and as low as 4.6 per cent in Group IV. This would seem to suggest that there is a tendency for a higher proportion of the lambs to be sold out somewhat earlier on the smaller farms, in store condition, owing to relatively heavier stocking and therefore greater demands on grass. Ewes also comprise a high proportion of sales, ranging from 24 per cent of numbers in Group I to as much as 38 per cent in Group IV. These are almost coincident with the corresponding proportions in terms of total values of sheep and wool. The average realisation prices per head indicate that a good class of sheep is sold.

Sales of Cattle.

	Average Price per head (£'s)	Percentage Distribution. Value.	Numbers.
Cows in Milk	24.43	2.5	2.5
Cows with Calves	31.13	3.6	2.9
Heifers in Calf	24.75	0.5	0.5
Bulls	35.00	2.2	1.6
Store Cows	18.98	4.7	6.1
Fat Cows	25.45	3.8	3.7
Fat Bullocks & Heifers	31.61	20.7	16.2
Stores 2 years & over	25.38	19.0	18.5
" 1 - 2 years	24.69	41.9	42.1
" 6-12 months	6.00	-	0.1
Calves under 6 months	5.14	1.0	5.1
Carcases	-	0.1	0.7
Total	-	100.0	100.0

As regards sales of cattle stores represent the most important category. The bulk of them, moreover, are between one and two years of age. Numbers do not fall much below one-third of total sales in any of the size groups, and in Group III are as high as 58 per cent of the total. Over the whole sample sales of stores of two years and over are about half as numerous as sales of those between one and two years. Here again there does not seem to be any uniform trend, those groups which recorded heavy sales in one of these age categories tending to show low ones in the other. Sales of stores from one year to upwards of two years of age range from 49.6 per cent in Group I to 69.6 per cent in Group IV. The average figures for sales of fat bullocks and heifers have to be treated with caution, as only a very small minority of the farms finished off any of their cattle. Thus in Groups I to IV only one, two, three, and four farms respectively recorded sales of fat cattle, and only three farms in Group V, a total of thirteen out of the sample of 48 farms. It may be seen from the accompanying tabular statement that the proportionate numbers and values of sales of the classes of stock considered above closely approximate to each other. The remaining classes of sales are of less importance and do not seem to require further elaboration.

Sales of pigs, poultry and eggs, and horses show some variations within the different size groups and are not of very great importance in any of them. Dairy products, which consist chiefly of butter and in a few instances small quantities of milk sold to employees, are of even less significance. The so-called "other receipts" are made up of such items as contract work performed for other farmers, sales of rabbits, service fees, cash rents of cottages attached to farms, and such non-cash items as rentals of farmhouses and cottages, and farm stores used in the farm households. In this case also such items only amount to very modest sums over the farms as a whole.

Government grants include payments under the Hill Sheep, Hill Cattle, Drainage, Ploughing and Premium Bull Schemes. It is only in the largest sized group that the average receipts from these sources reach an appreciable figure.

The Hill Sheep Subsidy Scheme was initiated in 1940-41 to alleviate the financial position of hill sheep farmers who maintained permanent breeding flocks of approved hill breeds. Its provisions made for relatively smooth working in Breconshire, but in Radnorshire very few farmers qualified for aid owing to the widespread practice of selling out the young stock. In 1942-43 and subsequent years, however, payment has been made at two rates, the full-rate being in respect of self-maintained flocks of the approved breeds, with a half-rate on flocks where rather heavier rams are used and where the progeny are generally sold out. It appears that the majority of farms in Radnorshire which qualify for subsidy, therefore, do so in this category. Even so, it is still a condition that flocks must be kept under hill conditions. Of the farms in this sample just under one half qualified in one or other of these classes.

The Hill Cattle Subsidy commenced in 1943 and made provision for payment of a subsidy of £3 per head in respect of hardy home-bred cows, steers, and heifers kept day and night on hill land for not less than five months in the year. In the original form of the scheme the term "home-bred" in this connection denoted cattle of these specified categories bred in England and Wales, to the exclusion of those imported from Eire. From 1944 onwards, however, breeding cows and heifers of hardy type imported from Eire became eligible, but not steers. Holdings have to be at least 50 acres in extent, and not less than one half must consist of rough grazings, including the grazing equivalent of any common rights attached to farms. The primary object of the scheme, moreover, is to encourage the fuller use and thereby improve the quality of hill grazings. Receipt of subsidy carries with it certain obligations on the part of the occupier regarding improvements to the land concerned. During the year in question the scheme remained substantially unchanged, except that the qualifying period was reduced to 16 weeks. Fifteen of the farms in the present sample received payments from this source.

Only three farms recorded drainage grants, the assistance in this case taking the form of rebates amounting to a maximum of 50 per cent of the costs of approved schemes. Two farms received payment under the Premium Bull Scheme, and forty-one farms for ploughing up old grassland.

The values of foodstuffs produced on farms and consumed in farm households have been included as non-cash items of receipts.

Total receipts naturally increase with increasing size of farm, and show the reverse trend when expressed in terms of per 100 acres.

The chief items of expensesare set out in Table VIII. Rent is not of major importance in any of the groups and amounts to about 18 shillings per acre in the smallest farms, falling consistently to just under 12 shillings in the group of largest farms, and averaging about 13 shillings over the whole sample.

As might have been anticipated from the foregoing observations on systems of management in the case of the cattle and sheep enterprises, purchases of livestock represent quite significant amounts. As already pointed out, however, not all of the farms under review bought livestock, while the small size of the sample does not seem to warrant any classification on this basis.

The only other item which seems to merit attention is labour. This is the most important constituent in the cost structure in all groups. When allowance is made for the manual labour performed by the farmer and his wife, the total outlay on this factor amounts to 46 per cent of expenses in the smallest group, falling to 36 per cent on the largest farms, and averaging 40 per cent over the whole sample.

The constitution of the labour force is given in Table IX from which it is apparent that these are to a very great extent family farms. Farmers and their wives, together with sons and daughters, comprised the greater part of the labour complement in all groups, while in the first three groups there was on average, less than one full-time hired person employed per farm throughout the year. The farmers were fully engaged on farm work except in a few isolated instances where they were prevented by age and infirmities, while farmers' wives almost invariably devoted a portion of their time to appropriate farm tasks.

Increases in total expenses are particularly steep between Groups I and II, and Groups IV and V.

The relationship between receipts and expenses is shown in Table X. The difference between total receipts (including value of farm produce consumed) and total expenses (excluding valuation of labour of farmer and wife) gives the cash balance. These balances amount to very modest sums in the first three size groups and only reach reasonable proportions in the two largest groups. When allowance is made for differences between opening and closing valuations of livestock, implements, and crops, the resulting figure is termed the farm income. It is only reasonable to expect that this sum should be sufficient to provide the farmer with a return on his capital commensurate with that obtainable in similar forms of production, along with a reward for the manual labour performed by himself and his wife, and for his own managerial activities. Hitherto, it has been the practice to allow for interest on capital at the rate of 6 per cent per annum, and such a deduction has been made in Table X in order to arrive at the farm income. It is realised, however, that under present conditions a more appropriate rate would be in the region of 3 per cent, and figures for managerial earnings have also been worked out on this basis. But even under this more favourable assumption the residual amounts are by no means satisfactory. The larger farms naturally show the better results. As may

be seen from Table XI the rate of turnover of capital is fairly constant throughout and is rather on the low side. Over all farms just under two-thirds of the value of capital is turned over annually, whereas in the case of a sample of dairy farms the corresponding proportion was about 90 per cent.

Receipts per £100 wages and per £100 expenses, however, increase consistently from the smaller to the larger farms. The receipts per full-time person employed also show the advantage to lie overwhelmingly with the larger farms, those for the largest sized group being nearly twice those for the smallest. Output per man, moreover, is of paramount importance and determines in large measure the potential standards of living of those engaged in the industry. The aim therefore must be to increase this output still further as in it lies the solution to the expanded agriculture envisaged under the recently announced plan.

As may be seen from the comparison given in the following summary stock-raising farms are much less intensive than dairy farms.

Comparison of Outputs.

	0 - 99 Acres		100 - 199 Ac.		200-299 Acres.	
	Dairy Farms	Stock-Raising	Dairy-Farms	Stock-Raising	Dairy Farms	Stock-Raising
Average Size of Farm (Acres)	64.9	75.1	136.0	142.3	252.2	228.6
	£.	£.	£.	£.	£.	£.
Receipts per Farm	1262.7	735.1	2127.1	1126.0	3650.0	1631.8
Receipts per 100 Acres	1944.8	978.2	1563.9	791.1	1447.2	713.8
Receipts per £100 Wages (inc. Farmer and Wife)	315.6	210.8	340.4	249.9	396.4	294.5
Receipts per full-time person employed	478.3	348.4	536.7	430.7	628.0	519.7

The two sets of farms in the different acreage groups are fairly near as regards average size, although it should be pointed out that the rentals of the dairy farms are higher than those for the stock-raising farms, especially in the 100-199 acre group. Thus over all farms, the average rental for the dairy group works out at about 24 shillings per acre as against 15 shillings for the stock-rearing farms. While a part of this difference may be attributable to greater investment in the form of landlords' capital in the case of the dairy farms it is, perhaps, also an indication of the somewhat greater fertility of these farms over those in the stock-rearing group. Nevertheless, the summary does serve to show the different levels of production in these two farming types.

It is, perhaps, too much to expect that the returns for predominantly rearing farms should approximate to those for similar sized dairy farms, in view of

the differences both in the nature of the enterprises and in the relative inputs. But livestock production is as important as that of milk, and every effort should be made to achieve the increases aimed at in the agricultural expansion programme. The percentage increases over pre-war production laid down for livestock products are not so spectacular as those for crops, but the inherent differences in the two forms of production render increases in the former a much slower process. Prices of fat cattle and fat sheep and lambs continue to be guaranteed and announced in advance, and it is to be hoped that this fact will serve to safeguard the corresponding prices of store stock, with which these farms are chiefly concerned. The payment of a direct subsidy of £4 for each approved steer and £3 for each approved heifer calf reared to twelve months should, however, prove an incentive to farmers to rear more calves.

The realisation of satisfactory incomes on these rearing farms, especially the smaller ones, depends to some considerable extent on the achievement of more intensive production. As already indicated this is more difficult to accomplish under upland than lowland conditions. Yet farmers at the medium to higher elevations, no less than those on the lowlands, have in the past adapted their farming methods to meet changing conditions, and will continue to do so. Thus in the case of sheep they have drastically reduced the numbers of wethers with the decline in public taste for this class of mutton, and increased the numbers of breeding ewes, incidentally achieving a quicker rate of turnover. The development of the fat lamb trade has served to induce increasing numbers of upland farmers to grade a proportion of their wether lambs, while at the medium and lower elevations crosses which give heavier weights have come into favour during recent years, even where this means some sacrifice in early maturing qualities. Such changes in systems of management are found to have taken place in the two counties under review, where particular attention is given to the sheep enterprise. Total numbers of sheep in Brecon and Radnor in 1946, moreover, were the highest ever recorded since such particulars were first obtained officially on an annual basis in 1867. The increases in Brecon and Radnor between 1939 and 1946 amounted to 2.5 and 6.1 per cent respectively. The severe weather of the past winter, however, resulted in the loss of one-third of the sheep population of Radnor and 37 per cent of that of Brecon.

The cattle enterprise, on the other hand, has not shown such drastic changes, and probably offers greater opportunity for some adaptation in methods of management. The "one calf per cow" system is still widespread, although, as already indicated, the practice of rearing two or more is gaining ground. While making greater demands on labour and on feed supplies and possibly on cropping, the latter is a step in the right direction, and in view of the urgent call for increased beef supplies will doubtless receive the active encouragement of those responsible for implementing agricultural policy in the counties concerned. Hand fed foods both in the calf stage and during the store period could be improved with advantage, while sheep are usually given the run of the better pastures, especially in spring before they are turned on to the hills. While it is realised that it is not possible to eliminate the store period, somewhat better feeding and grazing would make for more uniform growth in stores and possibly better milking qualities and therefore improved rearing propensities in cows. It also seems established that it will not be possible to obtain the necessary supplies from 100 per cent beef cattle and that there will have to be resort to cross-breds. The recently announced

scheme for a free artificial insemination service from colour-marking beef bulls (of three approved breeds) for the purpose of producing calves for rearing for beef should go some considerable way towards replenishing our supplies. This scheme, of course, is only intended to be utilised in the case of cows of moderate milking capacity, whose calves may be reared for beef, and would otherwise be slaughtered as bobbies or perhaps eventually transferred into milking herds to the detriment of our dairy industry. The Brecon Agricultural Executive Committee has for some time operated a scheme for salvaging young Hereford and Hereford-cross calves from Ministry of Food collecting centres, chiefly for dispatch to rearing areas outside the county, although substantial numbers have been retained by the Committee and sold out as forward stores or in fat condition. It appears that the possibilities of extending this practice are under active consideration.

While the rearing of sheep and of cattle must remain the chief forms of production, opportunities for extending poultry and pig-keeping will probably increase, and these might well become useful supplementary enterprises in the general farming economy.

With the call for an increase in the value of the agricultural output of the order of £100 million (or 20 per cent) by 1951-2, the industry has been set a formidable task. It is, however, to receive favourable consideration in the matter of labour supply, with prospects of increases in supplies of feedingstuffs, fertilisers, seeds, and agricultural machinery, along with improvements in ancillary aids to production such as farm buildings and houses for farm workers. Farmers are also assured of guaranteed prices for crops, fat stock, milk and eggs. The agriculture of Brecon and Radnor, it is true, is essentially of an intermediate nature, sales consisting chiefly of store cattle and store sheep and draft ewes for further breeding. Yet guarantee of prices for the finished products should serve to maintain satisfactory levels of prices in the markets for store stock. Farmers will at least be free from the vagaries of price fluctuations, and the stability thus afforded should enable a policy of expansion to be safely undertaken.

APPENDIX.

Table.

Table 1.

Land Utilisation (Per Farm).

Size Groups. (Acres).	I. 0 - 99	II. 100-149	III. 150-199	IV. 200-299	V. 300 +	All Farms.
Number of Farms	10	12	9	10	7	48
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Wheat	2.17	2.33	1.50	4.20	2.29	2.53
Barley	2.05	3.11	3.06	3.72	7.14	3.59
Oats	7.83	13.25	17.05	22.10	32.18	17.44
Mixed Corn	0.15	0.25	2.50	0.50	2.00	0.96
Rye	-	-	-	0.55	-	0.11
Total Corn	12.20	18.94	24.11	31.07	43.61	24.63
Potatoes	1.35	1.40	2.17	2.67	3.54	2.11
Mangolds	0.83	0.91	0.58	0.80	1.46	0.89
Turnips and Swedes	1.70	3.48	5.50	6.25	8.68	4.82
Kale and Cabbage	0.07	0.21	-	1.73	2.71	0.82
Rape	1.80	2.89	5.50	6.18	10.93	5.01
Linseed	-	-	-	0.25	-	0.05
Cultivated Orchards	-	-	0.03	-	-	0.01
Total Tillage	17.95	27.83	37.89	48.95	70.93	38.34
Temporary Grass for Hay	2.15	6.10	5.69	7.55	10.03	6.08
Temporary Grass for Grazing	1.10	0.92	4.64	6.05	10.79	4.16
Total Arable	21.20	34.85	48.22	62.55	91.75	48.58
Permanent Grass for Hay	9.85	12.19	12.78	21.18	28.50	16.06
Permanent Grass for Grazing	22.78	46.96	60.08	81.22	143.25	65.56
Total Permanent Grass	32.63	59.15	72.86	102.40	171.75	81.62
Rough Grazing	16.35	22.21	36.94	46.65	173.36	50.89
Total Crops	70.18	116.21	158.02	211.60	436.86	181.09
Buildings and Roads	1.35	1.98	1.50	2.25	4.14	2.13
Woodlands	3.62	3.18	10.75	14.75	12.71	8.49
Total Acreage	75.15	121.37	170.27	228.60	453.71	191.71

Table II.

Land Utilisation (Per 100 Acres).

Size Groups. (Acres).	I. 0-99	II. 100-149	III. 150-199	IV. 200-299	V. 300 +	All Farms.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Wheat	2.89	1.92	0.88	1.83	0.50	1.32
Barley	2.73	2.56	1.79	1.63	1.58	1.87
Oats	10.41	10.91	10.02	9.67	7.09	9.10
Mixed Corn	0.20	0.21	1.47	0.22	0.44	0.50
Rye	-	-	-	0.24	-	0.06
Total Corn	16.23	15.60	14.16	13.59	9.61	12.85
Potatoes	1.80	1.15	1.27	1.17	0.78	1.10
Mangolds	1.10	0.76	0.34	0.35	0.32	0.47
Turnips and Swedes	2.26	2.87	3.23	2.74	1.91	2.51
Kale and Cabbage	0.10	0.17	-	0.75	0.60	0.43
Rape	2.40	2.38	3.23	2.70	2.41	2.61
Linseed	-	-	-	0.11	-	0.03
Cultivated Orchards	-	-	0.02	-	-	-
Total Tillage	23.89	22.93	22.25	21.41	15.63	20.00
Temporary Grass for Hay	2.86	5.03	3.35	3.30	2.22	3.17
Temporary Grass for Grazing	1.46	0.75	2.72	2.65	2.37	2.17
Total Arable	28.21	28.71	28.32	27.36	20.22	25.34
Permanent Grass for Hay	13.11	10.04	7.50	9.26	6.28	8.38
Permanent Grass for Grazing	30.30	38.69	35.29	35.53	31.57	34.20
Total Permanent Grass	43.41	48.73	42.79	44.79	37.85	42.58
Rough Grazing	21.76	18.30	21.70	20.41	38.22	26.54
Total Crops	93.38	95.74	92.81	92.56	96.29	94.46
Buildings and Roads	1.80	1.63	0.88	0.99	0.91	1.11
Woodlands	4.82	2.63	6.31	6.45	2.80	4.43
Total Acreage	100.00	100.00	100.00	100.00	100.00	100.00

Table III.

Numbers of Livestock Per Farm.
(Average Opening & Closing Valuations).

Size Groups (Acres)	I. 0-99	II. 100-149	III. 150-199	IV. 200-299	V. 300 +	All Farms.
	No.	No.	No.	No.	No.	No.
Cows and In-Calf Heifers	7.4	9.8	12.2	17.6	26.0	13.7
Other Cattle	12.0	19.4	22.1	31.2	44.1	24.4
Total Cattle	19.4	29.2	34.3	48.8	70.1	38.1
Breeding Ewes	71.2	95.5	130.4	174.6	303.4	143.8
Other Sheep	28.2	38.9	91.0	137.0	195.3	89.7
Total Sheep	99.4	134.4	221.4	311.6	498.7	233.5
Breeding Sows	0.3	0.2	0.3	-	0.6	0.2
Other Pigs	3.9	1.3	2.0	2.3	1.8	2.3
Total Pigs	4.2	1.5	2.3	2.3	2.4	2.5
Laying Fowls	48.2	60.5	48.4	85.4	86.6	64.7
Other Poultry	4.8	10.3	7.4	15.4	7.7	9.3
Total Poultry	53.0	70.8	55.8	100.8	94.3	74.0
Work Horses	2.2	2.4	3.1	2.7	5.0	2.9
Other Horses	1.0	0.3	1.1	2.6	4.3	1.6
Total Horses	3.2	2.7	4.2	5.3	9.3	4.5

Table IV.

Numbers of Livestock per 100 Acres.
(Average Opening and Closing Valuations).

Size Groups. (Acres).	I. 0-99	II. 100-149	III. 150-199	IV. 200-299	V. 300 +	All Farms.
	No.	No.	No.	No.	No.	No.
Cows and In-Calf Heifers	9.8	8.1	7.2	7.7	5.7	7.2
Other Cattle	16.0	16.0	13.0	13.6	9.7	12.7
Total Cattle	25.8	24.1	20.2	21.3	15.4	19.9
Breeding Ewes	94.7	78.7	76.6	76.4	66.9	75.0
Other Sheep	37.5	32.0	53.4	59.9	43.0	46.8
Total Sheep	132.2	110.7	130.0	136.3	109.9	121.8
Breeding Sows	0.4	0.1	0.2	-	0.1	0.1
Other Pigs	5.2	1.1	1.2	1.0	0.4	1.2
Total Pigs	5.6	1.2	1.4	1.0	0.5	1.3
Laying Fowls	64.1	49.8	28.4	37.3	19.1	33.7
Other Poultry	6.4	8.5	4.4	6.7	1.7	4.8
Total Poultry	70.5	58.3	32.8	44.0	20.8	38.5
Work Horses	2.9	2.0	1.8	1.2	1.1	1.5
Other Horses	1.3	0.2	0.6	1.1	0.9	0.9
Total Horses	4.2	2.2	2.4	2.3	2.0	2.4

Table V.

Numbers of Livestock in Cow Units.

Size-Groups (Acres)	I. 0 - 99		II. 100-149		III. 150-199		IV. 200-299		V. 300 +		All Farms.	
	Per Farm	Per 100 Acres	Per Farm	Per 100 Acres	Per Farm	Per 100 Acres	Per Farm	Per 100 Acres	Per Farm	Per 100 Acres	Per Farm	Per 100 Acres
Cows	5.7	7.6	8.6	7.1	10.6	6.2	14.2	6.2	20.7	4.6	11.3	5.9
Other Cattle	5.5	7.3	8.3	6.9	9.6	5.7	14.4	6.2	20.2	4.4	11.0	5.7
Total	11.2	14.9	16.9	14.0	20.2	11.9	28.6	12.4	40.9	9.0	22.3	11.6
Other Stock	16.1	21.3	20.0	16.4	31.2	18.3	41.9	18.3	67.4	14.8	32.6	17.0
Total Livestock	27.3	36.2	36.9	30.4	51.4	30.2	70.5	30.7	108.3	23.8	54.9	28.6

Table VI.

Capital per Farm.
(Livestock and Implements).

Size Groups (Acres)	I. 0-99	II. 100-149	III. 150-199	IV. 200-299	V. 300 +	All Farms.
	£.	£.	£.	£.	£.	£.
Cattle	335.4	514.1	638.4	901.7	1282.8	693.1
Sheep	267.3	363.1	590.8	890.0	1544.0	667.8
Pigs	25.9	19.7	21.7	26.2	19.7	22.7
Poultry	24.2	40.1	28.5	53.9	44.0	38.1
Horses	123.7	107.2	162.7	149.5	156.6	137.0
Total Livestock	776.5	1044.2	1442.1	2021.3	3047.1	1558.7
Implements	216.1	340.6	520.5	673.4	856.7	493.0
Total Livestock & Implements	992.6	1384.8	1962.6	2694.7	3903.8	2051.7
Total Livestock & Implements (Per 100 Acres)	1320.8	1140.9	1152.5	1178.8	860.4	1070.2

Table VII.

Receipts (Per Farm).

Size Groups. (Acres)	I. 0-99	II. 100-149	III. 150-199	IV. 200-299	V. 300 +	All Farms.
Acres	75.2	121.4	170.3	228.6	453.7	191.7
	£.	£.	£.	£.	£.	£.
Crops & Acreage Payments	65.9	60.0	104.7	177.4	251.4	122.0
Cattle	232.7	340.6	418.7	484.1	803.2	430.1
Sheep	215.5	432.7	415.3	671.4	1324.4	564.0
Pigs	23.0	4.4	20.1	3.7	16.4	12.8
Poultry	61.1	74.1	60.0	92.3	108.9	77.6
Horses	30.1	14.5	16.4	21.5	23.4	21.6
Total Livestock	562.4	866.3	930.5	1273.0	2281.3	1106.1
Dairy Products	2.3	10.9	8.6	3.9	1.4	5.8
Total Grants	19.7	20.1	49.2	43.2	156.3	50.1
Other Receipts	12.5	14.9	52.8	39.6	52.0	32.1
Total Receipts (excluding Farm Produce)	662.8	972.2	1145.8	1537.1	2742.4	1316.1
Value of Produce Consumed	72.3	77.3	82.1	94.7	89.1	82.5
Total Receipts (incl. Farm Produce)						
Per Farm	735.1	1049.5	1227.9	1631.8	2831.5	1398.6
Per 100 Acres	978.2	864.7	721.1	713.8	624.1	729.5

Table VIII.

Expenses (Per Farm).

Size Groups (Acres).	I. 0-99	II. 100-149	III. 150-199	IV. 200-299	V. 300 +	All Farms.
Acres	75.2	121.4	170.3	228.6	453.7	191.7
	£.	£.	£.	£.	£.	£.
Rent	68.1	89.1	106.1	146.9	263.0	125.3
Rates	6.5	7.1	12.8	12.3	15.9	10.4
Livestock	142.7	266.2	202.6	174.2	460.3	237.7
Foods	17.8	21.7	27.8	25.1	44.0	26.0
Stock-keep	0.9	3.8	11.2	12.6	21.1	8.9
Seeds	26.3	42.1	51.5	61.5	107.6	54.2
Fertilisers	32.6	50.1	70.9	89.5	71.6	61.7
Miscellaneous	81.2	100.7	148.6	202.6	288.4	154.2
Implements	28.8	16.6	68.1	77.6	113.4	55.6
Hired Labour	47.8	107.2	93.7	232.2	279.6	143.5
Casual Labour	5.3	5.7	26.4	28.4	38.0	18.9
Sons and Daughters	74.0	105.9	158.8	78.9	232.1	122.0
Total Labour (exc. Farmer and Wife)	127.1	218.8	278.9	339.5	549.7	284.4
Value of Farmer & Wife	221.5	197.6	217.2	214.5	223.3	213.5
Total Labour (inc. Farmer and Wife)	348.6	416.4	496.1	554.0	773.0	497.9
Total Expenses (excl. Farmer & Wife: Per Farm	532.0	816.2	978.5	1141.8	1935.0	1018.4
Per 100 Acres	707.9	672.5	574.6	499.5	426.5	531.2
Total Expenses (incl. Farmer & Wife: Per Farm	753.5	1013.8	1195.7	1356.3	2158.3	1231.9
Per 100 Acres	1002.7	835.3	702.2	593.3	475.7	642.6

Table IX.

Numbers of Full-time Persons Employed.

Size Groups (Acres)	I. 0-99		II. 100-149		III. 150-199		IV. 200-299		V. 300 +		All Farms.	
	Per Farm	Per 100 Acres	Per Farm	Per 100 Acres	Per Farm	Per 100 Acres	Per Farm	Per 100 Acres	Per Farm	Per 100 Acres	Per Farms	Per 100 Acres
Hired	0.33	0.45	0.73	0.60	0.65	0.38	1.50	0.66	1.88	0.41	0.96	0.50
Sons & Daughters	0.55	0.73	0.63	0.52	1.00	0.59	0.46	0.20	1.34	0.30	0.75	0.39
Farmer and Wife	1.23	1.63	1.08	0.89	1.19	0.70	1.18	0.51	1.23	0.27	1.17	0.61
Total	2.11	2.81	2.44	2.01	2.84	1.67	3.14	1.37	4.45	0.98	2.88	1.50

Table X.

Farm Income, Labour Income & Managerial Earnings in £'s per Farm.

Size Groups. (Acres)	I. 0-99	II. 100-149	III. 150-199	IV. 200-299	V. 300 +	All Farms.
	£.	£.	£.	£.	£.	£.
Total Receipts (incl. Farm Produce)	735.1	1049.5	1227.9	1631.8	2831.5	1398.6
Total Expenses (excl. Farmer & Wife)	532.0	816.2	978.5	1141.8	1935.0	1018.4
Cash Balance	+ 203.1	+ 233.3	+ 249.4	+ 490.0	+ 896.5	+ 380.2
Valuation Difference	+ 39.8	+ 82.2	+ 128.6	+ 154.5	+ 90.6	+ 98.4
Farm Income	+ 242.9	+ 315.5	+ 378.0	+ 644.5	+ 987.1	+ 478.6
Interest on Capital @ 6%	59.6	83.1	117.8	161.7	234.1	123.1
Labour Income	+ 183.3	+ 232.4	+ 260.2	+ 482.8	+ 753.0	+ 355.5
Allowances for Wages to Farmer and Wife	221.5	197.6	217.2	214.5	223.3	213.5
Managerial Earnings	- 38.2	+ 34.8	+ 43.0	+ 268.3	+ 529.7	+ 142.0
Farm Income	+ 242.9	+ 315.5	+ 378.0	+ 644.5	+ 987.1	+ 478.6
Interest on Capital @ 3%	29.8	41.5	58.9	80.8	117.0	61.5
Labour Income	+ 213.1	+ 274.0	+ 319.1	+ 563.7	+ 870.1	+ 417.1
Managerial Earnings	- 8.4	+ 76.4	+ 101.9	+ 349.2	+ 646.8	+ 203.6

Table XI.

Measures of Output.

Size Groups (Acres)	0-99.99	100 - 199.99	200 - 299.99	300 +	All Farms.
	£.	£.	£.	£.	£.
Receipts per £100 Wages (incl. Farmer and Wife)	210.8	249.9	294.5	366.3	280.9
Receipts per £100 Expenses (incl. Farmer and Wife)	97.6	103.1	120.3	131.2	113.5
Receipts per Full-time Person Employed (inc. Farmer and Wife)	348.4	430.7	519.7	635.7	484.7
Receipts per 100 Acres	978.2	791.1	713.8	624.1	729.5
	%.	%.	%.	%.	%.
Rate of turnover of capital	68.3	62.6	55.5	67.5	62.5