Cattle – Cost of production (O.S.)

UNIVERSITY COLLEGE OF WALES
ABERYSTWYTH

AN ECONOMIC STUDY OF STORE CATTLE RAISING IN

BRECON AND RADNOR.

DEPARTMENT OF AGRICULTURAL ECONOMICS
CAMBRIAN CHAMBERS, CAMBRIAN PLACE
ABERYSTWYTH

Price :

2/6d.

ACKNOWLEDGEMENT.

The Department acknowledges with thanks the assistance of those farmers who kindly provided the information which forms the basis of this report. Their ready co-operation in dealing with detailed enquiries is very much appreciated.

The report has been written by Mr. W. Dyfri Jones, B.Sc. Mr. Graham Hallett, B.A. assisted in the preparation of some of the material.

E. F. Nash.

Professor of Agricultural Economics.

July, 1956.

AN ECONOMIC STUDY OF STORE CATTLE RAISING IN BRECON AND RADNOR.

Summary.

The production of store cattle in Wales has been expanding since the end of the war. The rate of expansion has been more rapid in recent years, as a result of deliberate government policy to increase beef production at home and partly at the expense of dairy cattle. More attention has been paid to the financial position of hill farmers and hence of store-cattle rearers since 1946. As a result of the Hill Farming Act of 1946 and the Livestock Rearing Act of 1951 various grants and subsidies have been introduced for the purpose of providing a stimulus to livestock production. During the war years an ever-increasing number of calves were slaughtered at a young age but with the aid of the Calf Rearing Subsidy, the calf slaughterings are now being reduced annually.

It appears that the increase in number of stores is the result of an increase both in the numbers of pure beef-breed animals and also in those of surplus heifers and steers from dairy and dual-purpose herds. It is estimated that, in Wales, not more than one-third of the stores intended for beef are produced from beef herds. The proportion of steers under 1 year to total steers in Wales has risen sharply since 1951; this is the result of the expansion policy and also of a greater demand for smaller joints which has led to the selling of stores to fatteners at a younger age.

In this report an analysis is made of the financial aspects of store-cattle raising on a sample of about 27 farms in Brecon and Radnor during the period 1951-54. With two or three exceptions the farms were identical throughout the period. The stocking on our sample of farms was, on average, roughly 13 cow-units per 100 total acres and about 12 sheep over 1 year per cow unit, but on land of higher rental value and better general quality the emphasis on cattle production was relatively greater and that on sheep relatively smaller. With the exception of phosphates, the rate of manuring of grassland (excluding rough grazing), especially with nitrogenous manures, appeared to be rather lower than is considered necessary for the attainment of a high level of production. This was particularly true of the better-land farms with a higher potential fertility.

The margin per cow increased from about £13.10.0 in 1951-52 to just about £30 in 1953-54, mainly because of a sharp increase in prices of stores in 1952-53. The cash margin, (which is the margin excluding the valuation difference) averaged £10.10.0 per cow in 1951-52, but had more than doubled by 1953-54. The value of the Hill Land Subsidies alone amounted to between 43 and 56 per cent and that of the Attested Herd Bonus and Bull Grant to between 20 and 30 per cent of the cash margins during these years.

Owing to the economies in labour associated with a rising scale of production, costs per cow tended to decrease with increasing size of herd. The value of production was not related to size of herd and consequently there

was only a vague tendency for the margin (excluding credits) per cow to increase with increasing size of herd. The value of production per cow is more the function of the quality of the management and of the land, and although a high value of production was achieved in a few cases on the poorer land it was more commonly associated with better land. The prices of stores aged 12-18 months and the margin (excluding credits) per cow tended to increase with increasing rental per acre.

Food-costs accounted for about 40 per cent and labour for about 35-40 per cent of the total production costs. The five highest-margin farms, as a group, although they had slightly more "other cattle" per cow, showed lower food costs per cow for 1952-53 and 1953-54 because they fed more of the cheaper foods, especially straw and roots, using only the minimum requirement of concentrates. Cattle over 1 year on these farms generally were fed at the minimum requirement level during the winter months.

The practice of selling calves at weaning rather than at 18 months is becoming more common, especially in Breconshire, owing to the fact that it is believed to be highly profitable and also because it eases the problem of securing adequate winter-keep. However, the financial success of this policy is conditional on an adequate rate of replacement by breeding cows of calves sold; on the production of high-quality calves capable of fetching the highest prices, and upon the eligibility of the farm for the Hill Cow Subsidy.

Introduction.

The rearing of store cattle for fattening on the lowlands is traditional on Welsh upland farms. High rainfall and poor soil conditions make these farms unsuitable for the profitable cultivation of most cash crops, and, until quite recently, they were too remote from the main centres of population to be able to undertake the sale of liquid milk. The traditional system, therefore, is sheep farming and the rearing of store cattle by the suckling method. In recent years many of these farms have gone over to milk production; and on these farms calf rearing, when carried on, is by the pail-feeding method. In some areas, however, the rearing of pure beef-breed animals by the suckling method is still the main cattle enterprise, particularly in the counties of Brecon and Radnor, and it was from farms in this area that information was collected for this report.

The number of store cattle in Wales declined during the War and did not begin to increase again until about 1948. Table 1 compares the changes in the number of cows in Wales in the period 1940-54 with the changes in the number of yearling steers. The latter figure provides a better indication of the changes in numbers of store cattle than the total number of yearlings of both sexes because it is difficult to know how many heifers are being reared as dairy replacements. Separate figures for steers and heifers over 1 year are available only from 1940 onwards. It can be seen that whereas the number of cows rose

Table 1.

Numbers of Cattle in Wales.
('000's).

Year.	Cows, heifers in calf and bulls.	Male Cattle 1 - 2 years.
1940	382	72
1945	451	52
1950	482	63
1954	497	76

Source: June 4 Census Returns.

steadily throughout the war-period the number of steers fell during this period; and although it rose after the war it did not reach the pre-war level until 1954. In the last few years, the numbers of store cattle appear to have been increasing rapidly, to some extent at the expense of dairy cattle. Since 1953 farmers have been asked to distinguish, in their yearly returns, between cows kept for producing milk and those kept mainly for producing beef calves. The figures for Wales are as follows:-

Table 2.

Numbers of Cows and Heifers in Milk in Wales.
('000's).

For producing milk or calves for the dairy herd.		Mainly for producing calves for beef.	
June 1953.	June 1954.	June 1953.	June 1954.
342.4	337.7	54.6	70.4

Source: Ministry of Agriculture, Fisheries & Food.

The wartime decline in numbers of store cattle followed the government's decision to maintain the nation's wartime diet by encouraging the production of cash crops and milk and discouraging the production of beef, which is an expensive and slow method of food production. In pursuance of this policy the government, during the war and immediate post-war years, raised fat cattle prices far less than milk prices. Store cattle prices were not controlled, but, on the average, they moved fairly closely in accordance with those for fat cattle. Consequently, as is shown in Table 3, store cattle prices remained low relative to milk prices, until the sharp increase in 1952. This wartime price policy quickened the change-over to milk production which had been in evidence before the war. Thus the number of registered milk producers in Wales

Table 3.

Agricultural Price Indices (England and Wales).
(1927-29 = 100).

Year.	Store Cattle.	Milk.	Store Cattle Index as a % of Milk Index.
1937-9	93	100	93
1941	129	158	82
1943	142	178	80
1945	145	192	76
1947	171	222	77
1949	215	248	87
1950	207	261	79
1951	219	278	79
1952	251	293	98
1953	283	298	95

Source: Prices of Agricultural Produce - M.I. Series.
Ministry of Agriculture, Fisheries & Food.

increased by over a third between 1938 and 1946, and the quantity of milk sold by a half (Table 4). It is interesting to note the differences from county to county in the proportion of milk producers and the change in their numbers. At the moment, Radnorshire, with 9 per cent, has a far lower proportion of milk producers than any other county. In Breconshire the proportion of milk producers is also low, and in both these counties the increase in the number of milk producers has been small. There have been

Table 4.

(a) Milk Producers in Wales.

County.	Registered Milk Producers. 1938.	1946.	1951.	1954.	No. of Agricultural holdings of 5 acres and over. June 1954.	No. of milk producers in 1954 as a % of holdings.
Anglesey	626	950	1,163	1,147	3,095	37
Brecon	525	680	686	574	2,182	26
Caernarvon	1,336	2,030	2,218	2,068	3,887	53
Cardigan	1,977	3,080	3,464	3,539	4,700	75
Carmarthen	4,124	5,640	5,773	5,784	7,128	81
Denbigh	1,501	2,890	3,105	3,091	4,363	71
Flint	1,759	1,760	1,717	1,698	2,414	70
Glamorgan	2,498	2,490	2,414	2,162	3,674	59
Merioneth	752	1,240	1,132	1,069	2,160	50
Monmouth	1,402	1,620	1,542	1,477	3,229	46
Montgomery	1,222	1,380	1,712	1,672	4,440	38
Pembroke	2,411	3,520	3,467	3,478	4,689	74
Radnor	191	230	237	164	1,822	9
Wales	20,223	27,510	28,630	27,923	47,783	58

(b) Sales of Milk (million gallons).

Wales.	
1938-9	88.5
1945-6	129.7
1950-1	169.9
1953-4	199.9

Source: Welsh Digest of Statistics, Ministry of Agriculture, Fisheries & Food, Welsh Department, Aberystwyth.

substantial increases, however, in Caernarvon, Cardigan, Denbigh, Merioneth, Montgomery and Pembroke, which are other recognized store-rearing areas. In recent years, on the other hand, the number of steers in these counties has increased considerably.

Table 5.

Total Number of Steers under 1 year by Counties in Wales.

	1942.	1951.	1954.
Anglesey	6,003	4,451	6,694
Brecon	3,522	4,286	5,645
Caernarvon	4,161	3,960	6,175
Cardigan	5,060	3,858	5,728
Carmarthen.	2,398	2,636	4,334
Denbigh	6,214	5,711	9,063
Flint	1,654	1,858	3,261
Glamorgan	3,417	3,976	5,952
Merioneth	4,035	3,621	5,056
Monmouth	4,265	4,825	6,198
Montgomery	9,094	7,152	9,898
Pembroke	6,906	6,523	9,116
Radnor	4,108	4,213	4,964
Wales	60,837	57,070	82,084

Source: Welsh Digest of Statistics.

After about 1947 the government began to pay more attention to increasing the supply of store-cattle and improving the position of hill farmers. Under the Hill Farming Act of 1946 and the Livestock Rearing Act of 1951 subsidies were paid on cattle grazed on hill pastures, and grants of up to 50 per cent of the cost were made for approved schemes of investment. The Hill Cattle Subsidy had as one of its aims the improvement of those hill grazings which had deteriorated during this century through being insufficiently stocked with cattle. The subsidy was paid, therefore, only on cattle which grazed for not less than 4 months on "rough uncultivated land on high-lying farms in hill districts which is used mainly for stock rearing but which is unsuitable for dairy cattle, fat stock or crops."* The payment of this subsidy during the period under study i.e. 1951-54 was at the rate of £5 per head for cows and £2.15. 0 per head for other cattle. The Hill Cow Subsidy introduced in 1954 was not subject to the same limitation. It was paid at the rate of £10 per head on all cows kept in breeding herds on hill or heath land, which is unsuitable for dairying, fattening or for crops. Since the introduction of the Hill Cow Subsidy the Hill Cattle Subsidy has been reduced to £2 per head for all cattle.

The other main subsidy affecting hill farmers is the Calf Rearing Subsidy, instituted in 1946. This has been paid at different rates and under different conditions, but the principle has always been to pay the subsidy on calves considered suitable for beef production. In 1950-51 the Calf Subsidy was payable only on steers, at £5 per head, but in 1953-4 it was payable at this rate on both heifers and steers. At the moment the rate is £7.10. for every steer or heifer-calf reared to 9 months which, in the inspecting officer's opinion, will make good beef. It can therefore be paid on calves from dairy herds, provided that the cows are not of the extreme dairy type. In fact, it was one of the main purposes of the subsidy to encourage the rearing of the many dairy calves which had previously been slaughtered soon after birth. Table 6 shows the rise during the war and post-war years in the proportion of calves slaughtered and the decline in recent years.

Table 6.

No. of calves slaughtered per 100 cows (Great Britain).
('000s).

	1938	1945	1950	1951	1952	1953	1954
Calves slaughtered	836	1423	1344	1302	1197	1080	1015
Cows and heifers in calf	3576	3996	4262	4143	4156	4207	4245
Calves slaughtered per 100 cows	23.4	35.6	31.5	31.4	28.6	25.6	23.9

Source: Annual Abstract of Statistics.

On the upland rearing farms the Calf Subsidy is now an important element in the farm income. It has been argued that a better way to encourage

* Livestock Rearing Act, 1951.

the rearing of store cattle is to bring about a rise in beef - and hence in store cattle prices. The Calf subsidy has, however, the dual advantage of giving the rearer a quick cash return, and of providing an assured payment whatever the fluctuations in store prices.

The Hill Cattle and Hill Cow subsidies are intended to benefit only livestock-rearing farms. Farms producing a substantial quantity of milk are not eligible for the Hill Cow Subsidy; and although they may qualify if they produce only a small quantity of summer milk, the amount of the subsidy is reduced according to the quantity produced. The policy underlying these regulations is that of encouraging upland farmers to devote their resources to the production of livestock, leaving dairying and fattening to the lowlands. The wisdom of this policy is not unanimously accepted among economists because the rearing of livestock on small upland farms with a limited area does not, in general, provide their occupiers with a sufficient turnover to enable them to enjoy a reasonable standard of living. It is argued that, although desirable from an economic point of view, it is impracticable, in the short run, to bring about a rapid amalgamation of upland small-holdings: their occupiers should be encouraged to undertake milk production, leaving livestock rearing to larger farms. Whether this argument is accepted or not, it is certain that, even with the present high level of subsidies and store prices, the smaller upland farm yields a poor living to its occupier if he confines himself to livestock rearing.

Table 7 compares the profits on three types, and several sizes, of Welsh livestock-rearing farms. The figures given show the enterprise profit or loss, which is the farm profit minus the value of the work of the farmer and

Table 7.

Financial Results on a Sample of Welsh Livestock Rearing Farms 1953/4.

Size Group (Actual Acres).	0 - 99.	100-199.	200-499.	500 +.
	Enterprise Profit* or Loss* per 100 actual acres.			
Livestock Rearing (Poor Land):	£.	£.	£.	£.
Non-Milk Selling	- 179	20	128	50
Milk-Selling	- 111	105	130	41
Livestock Rearing (Better Land)	212	320	451	

* This is the difference between the value of Farm Production and Total Expenses including a charge for the Labour of the Farmer and his Wife.

Source: Farm Managament Survey: Comparative Tables, Department of Agricultural Economics, University College of Wales, Aberystwyth.

his wife, calculated on the basis of the current statutory rates. If there is an enterprise loss it means that the farmer is earning less than a farm labourer. These figures are subject to all the qualifications attending

the comparison of averages, but they suffice to illustrate the point that the profits of the Poor Land farms of under 100 acres which do not sell milk are very low, and that similar farms selling milk make larger profits or smaller losses. With present prices and subsidies, however, cattle rearing is profitable on larger upland farms, or as a sideline on dairy farms.

There has been a considerable increase in the number of store cattle reared in Wales in the last ten years. It can be seen from Table 1 of Appendix A that the number of yearling steers has risen steadily since 1948. This trend appears to have been the result of an increase in the number both of beef-breed cattle (Herefords and Welsh Blacks) on upland farms and of surplus calves from dairy herds, for there has been an increase in the number of yearling steers not only in the primarily rearing counties such as Radnorshire but also in primarily dairying counties like Carmarthenshire and Flintshire. It would appear that dairy and dual-purpose herds of other types now produce a very large proportion of the store cattle reared in Wales. For example, in 1954, there were about 55,000 cows and heifers in beef-breeding herds in Wales; these would produce approximately 53,000 calves (not all of which would qualify for the Calf Rearing Subsidy) whereas the total number of calves certified for the Calf Rearing Subsidy in that year was 140,000. If we assume that 9,000 heifer calves are kept for replacement purposes, then the figures suggest that not more than one-third of the beef stores in Wales are produced from beef herds.

Table 8.

Number of Calves Certified for Calf Rearing Subsidy in Wales.

£

	Number of Calves Certified.			Amount paid at £5 per head.	No. of Calves Rejected.
	Steers.	Heifers.	Total.		
1953	68,816	74,654	143,470	717,350	43,755
1954	70,945	68,861	139,806	699,030	28,610
1955 (£5 & £7.10)	66,141	67,467	133,608	672,187	21,138

Source: Welsh Digest of Statistics.

Table 9 shows the total number and age-distribution of steers in Wales for 1942 (the first year for which separate figures for steers and heifers under 1 year are available), 1951 and 1954. The total number of

Table 9.

Total Number and percentage distribution of Steers according to age. (Wales).

	All Steers.		Under 1 year.	1 - 2 years.	2 years and over.
	No.	%	%	%	%
1942	161,065	100	38	37	25
1951	169,255	100	34	36	30
1954	215,333	100	40	35	25

Source: Welsh Digest of Statistics.

steers increased by over 25 per cent between 1951 and 1954. It is interesting to see that the proportion of steers under one year has risen considerably since 1951 largely at the expense of stores of 2 years and over. This is the result partly of a deliberate policy to expand beef-production and also partly of the increased demand for smaller joints and a consequent policy of selling and killing-off at a younger age.

STORE-CATTLE RAISING FARMS IN BRECON AND RADNOR.

The Sample.

The sample consisted of 26, 28 and 27 farms in 1951-2, 1952-53 and 1953-54 respectively; with the exception of 2 or 3 only, they were indentical throughout the period, a fact which makes the average results closely comparable for the three years. The average size of farm was roughly 280 acres; but it was reduced slightly in 1953-54, mainly because one of the farms underwent fragmentation. Well over half the farms were between 200 and 400 acres; none were less than 100 but a few were over 400 acres. The majority were at a high elevation, some being at 1000 ft. or more. The larger proportion had a good depth of soil but its light nature rendered it unsuitable for fattening and the production of crops for sale, and for that reason store raising was the traditional system of husbandry on these farms. Approximately half the total acreage was under permanent grass, whilst the remainder consisted of more or less equal areas of rough grazing and arable land.

Table 10.

Average size of Farms and Land Utilisation.

	1951-52	1952-53	1953-54
Number of farms	26	28	27
Total Acreage per Farm	280	283	270
	%	%	%
Arable (incl. temporary grass)	23	22	22
Permanent Grass	47	48	50
Rough Grazing	30	30	28

Stocking.

The accounting period was from 1st May of one year to 30th April of the following and the average stocking, as presented in Table 11, was the average number of each category of livestock in the opening and closing valuations. The average number of breeding cows carried remained more or less constant throughout the period 1951 to 1954, at about 21 per farm and 7 or 8 per 100 acres. The average numbers showed only a very slight increase. No significant changes were shown in the number of other cattle carried but, owing to their larger numbers, there was a more apparent increase in the number of sheep and lambs carried. During the period 1951-52 to 1953-54, the number of ewes and other sheep over 1 year increased from 142 to 165 per 100 acres and that of lambs from 88 to 102 per 100 acres.

Table 11.

Stock Carried per Farm and per 100 acres.

	Per Farm.			Per 100 Acres.		
	1951-2	1952-3	1953-4	1951-2	1952-3	1953-4
Number of Farms	26	28	27	26	28	27
Average Size of Farms	280	283	274	280	283	274
Cattle:						
Cows	20.5	20.8	21.7	7.3	7.4	7.9
Bulls	-	0.9	1.0	0.3	0.3	0.3
Other Cattle: Over 3 years	0.2	-	0.2	0.1	-	0.1
2 - 3 "	4.2	3.9	4.0	1.5	1.4	1.5
1 - 2 "	12.6	12.2	12.5	4.5	4.3	4.6
0 - 12 months	16.6	17.5	17.2	5.9	6.2	6.2
Cow Units (Cattle only)	36.3	36.2	37.4	13.0	12.8	13.6
Sheep:						
Ewes & Other Sheep over 1 year	396.4	438.0	451.0	141.6	154.8	164.5
Lambs	244.9	272.9	278.3	87.5	96.4	101.5
Numbers of Ewes & Other Sheep over 1 year -						
(a) per cow unit	10.9	12.1	12.1	10.9	12.1	12.1
(b) per breeding cow	19.4	20.9	20.8	19.4	20.9	20.8
Sows and Other Pigs	3.0	3.4	4.4	1.1	1.2	1.6
Poultry	152.8	138.8	139.8	54.6	49.0	51.0
Horses	3.9	3.2	2.9	1.4	1.1	1.1
Total Cow Units (All Stock)	114.5	121.9	125.4	40.9	43.1	45.7

The increase in number of ewes and other sheep over 1 year was due largely to the increase in number of wethers. About 20 ewes and other sheep over 1 year were carried to every breeding cow. When other cattle were converted into cow units and included with the cows, the proportion became about 11 or 12 ewes and other sheep over 1 year to each cow-unit; a small increase in this number was noticeable. When all the livestock, cattle, sheep, pigs, poultry and horses were arbitrarily converted into cow-units, it appeared that the stocking on our sample of farms increased by about 12 per cent from 1951-52 to 1953-54.

There was no relation between the intensity of total stocking and the average rental per acre. There was however a distinct relation between the relative intensities of cattle and sheep stocking and the rental of the farm. Generally, as the rent increased, the proportion of tillage and the number of cattle carried per 100 acres rose, while the proportion of rough grazings to total acreage and the number of sheep carried per 100 acres diminished. The farms with rentals of 10-15 shillings were, however, an exception to this general rule, for here the intensity of cattle stocking was lower and that of sheep stocking even higher than that for the lowest rental group. The only explanation for this is that the 5 farms in this particular

Table 12.

Intensity of Stocking according to the Rental per acre. Average for 1952-53.

Average Rent per Acre.	No. of Farms.	Average Size of Farm.	Rough Grazing Per cent of Total Acreage.	Tillage as Per Cent of Total Acreage.	Cow Units (Cattle only) per 100 acres.	Sheep over 1 year per 100 acres.	Sheep over 1 year per Cow Unit (Cattle only).	Cow Units (Cattle & Sheep over 1 year) per 100 acres.
		acres.	%.	%.	No.	No.	No.	No.
6/- to 9/11	4	232	50	14	11.5	161	14	35
10/- " 14/11	5	331	46	13	10.4	235	23	44
15/- " 19/11	8	328	25	19	12.1	141	12	32
20/- " 24/11	5	212	20	23	15.1	141	9	35
25/- & over	6	275	15	25	15.5	102	7	30
Average	28	283	30	19	12.8	155	12	35

rent group probably possessed large tracts of rough grazings of better quality than the average, thus enabling more sheep to be carried to the acre.

Application of Manures to Grassland.

Table 13 gives some indication of the quantities of manures and fertilizers applied to grassland (excluding rough grazings) on these farms. The farms have been grouped according to their average rental per acre and

Table 13.

Average Annual Applications of Manures to Grassland according to rent of farm. Average Results for 24 Identical Farms for 1951-54.

Rent Group.	No. of Farms.	F.Y.M.	Other Nitrogerous.	Compounds.	Phosphatic.	Lime.	Approx. Sul. of Ammonia Equiv.	Approx. Basic Slag Equiv.
Per acre.		tons.	cwt.	cwt.	cwt.	tons.	cwt.	cwt.
	Per 100 acres of Grassland (Permanent & Temporary).							
6/- to 9/11	4	78	-	14.0	250	14	44.5	300-350
10/- " 14/11	5	42	13	15.0	170	20	40.0	200-240
15/- " 19/11	4	18	4	0.5	102	14	13.0	110-135
20/- " 24/11	5	16	3	29.0	187	13	22.0	210-260
25/- & over	6	2	5	23.0	132	10	15.0	150-180
Average for all farms	24	22	5½	17.0	155	14	23.0	175-215

the quantities quoted are the average annual applications for the years 1951-52, 1952-53 and 1953-54. The average annual application for all farms of F.Y.M. and artificials was rather low. The equivalent of less than ¼ cwt. per acre of sulphate of ammonia was applied in the form of dung, and/or of straight and compound artificials. The average application of phosphatic manures was more satisfactory at 1½ cwt. per acre per annum or 4½ cwt. every 3 years; if the phosphate contained in the F.Y.M. and compounds is included,

then the equivalent of approximately 2 cwt. of basic slag per acre per annum or 6 cwt. per acre every 3 years was applied. The quantity of potash applied was negligible. On the type of soil generally prevailing on these farms it is considered advisable to apply 6-8 cwt. of slag every 3 years and also, to assist in the encouragement of clovers, 1 cwt. of muriate of potash per acre. To provide greater bulk of grass and to help towards a longer grazing season a minimum of 1½ cwt. per acre of sulphate of ammonia is an additional requirement every year. The equivalent of about 1/7th ton of lime was applied during the 3 years whereas the recommended application for a similar period is 3 or 4 tons per acre.

A study of the application of manures on grassland according to the rental per acre of farms shows that the most striking feature was the rapid reduction in the use of F.Y.M. with the increasing rental. The intensity of cattle stocking per 100 acres of crops and grass (excluding rough grazings) was very similar for all, apart from the lowest-rent group, in which it was, surprisingly, somewhat heavier. Since, on the majority of farms, the cattle were in-wintered roughly similar quantities of dung were available, therefore, for application per 100 acres of crops and grass in all except the lowest-rent group. But the proportion of tillage to grassland was also fairly constant for all rent-groups and, therefore, it appears that the higher-rent farms dung their tillage area more heavily. It is the policy of the latter to sell lambs fattened on roots in the autumn; consequently, since roots respond so well to heavy dressings of dung, their application of it to tillage is heavier than that of the lower-rent farms. The poorer upland farms are usually very deficient in phosphate, but it appears that for the poorer-land category in our sample a comparatively liberal quantity was supplied as artificial manure, mainly basic slag. Owing to the heavy leaching on these farms, however, they could have done with even heavier applications of dung and of artificial nitrogenous manures. The figures in the above table suggest, in particular, that the higher-rent farms, with a higher potential fertility, might well have increased their production of grass and winter keep through the more liberal use of dung and of artificial nitrogenous and phosphatic manures.

Breed and System of Rearing.

The cattle, almost without exception, were Herefords; and the calves, the large majority of which were spring born, were allowed to run with their dams during the spring and summer months, each cow suckling one calf. Multiple-suckling is not a common practice on Welsh store-raising farms - it is doubtful whether the milking capacity of the Hereford and Welsh Black cows would permit it. Although the single suckling system tends to be more expensive because the total cost of keeping the breeding cow has to be charged to only one calf, it results in better-quality calves and stores than does the multiple system. Nutritionists emphaisize the fact that proper feeding during the first six months of its life has a very important bearing on the future performance of the beef or dairy animal. If multiple-suckling were widely adopted surplus calves from dual-purpose and dairy herds would have to be purchased.

FINANCIAL RESULTS.

The following table shows that, apart from a temporary drop in the prices of two-year-olds in the autumn of 1954 owing to the shortage of winter-keep, the prices of the main breeds of stores reared in Wales have been increasing steadily in recent years. The Hereford, with a high reputation as an early maturer and for putting on weight, commanded the highest price.

Table 14.

Prices per Head of 1st. Quality Stores.

Breed.	Yearling Steers.					Two-year-old- Steers.				
	1953.		1954.		1955	1953		1954		1955
	(a) Spring	(b) Autumn	Spring	Autumn	Spring	Spring	Autumn	Spring	Autumn	Spring
	£. s	£. s	£. s	£. s	£. s	£. s	£. s	£. s	£. s	£. s
Shorthorn	35.10	35. 2	38. 4	36. 0	43. 3	55.17	56.17	59. 3	53.17	62.15
Hereford	42. 2	41.14	45. 5	42. 3	47.11	61. 2	61. 8	64. 6	57.13	67.12
Welsh Runts(c)	41.10	33.15	40. 3	32.18	42.14	60. 3	60. 7	60. 6	56.13	65. 2

Source: Ministry of Agriculture's 'Market Report'.

(a) Average for March, April and May.

(b) Average for September, October and November.

(c) Quotations for Llangefni only.

The financial results of store cattle raising on our sample of farms in 1951-52, 1952-53 and 1953-54 are summarized in Table 15. The value of cattle production, which is the difference between the closing valuation plus sales on the one hand, and the opening valuation plus purchases on the other, is shown to have increased steeply in the second year from £997 to £1355 per farm and to have increased again in the third to £1449. The value of cattle production, if all classes of cattle are valued at constant prices throughout, should represent the comparable overall increase in the value of cattle resulting from births, increased weight and maturity during each year. In this analysis, breeding stock were valued at constant prices throughout but calves and stores were valued at prevailing market prices. It so happened that the prices of calves and stores rose steeply in 1952-3, a fact which resulted in a large increase in the value of production in 1952-3 as compared with that for the previous year. Production showed a further, but very much smaller, increase in 1953-4. Prices did not rise as sharply as in 1952-3 and the valuation difference was less but, on the other hand, the value of sales continued to increase, the increase being much greater than for 1952-3. The numerical composition of the respective valuations showed little change from year to year; there were slightly fewer sales in the second than in the first year, but a small increase in sales of calves at the expense of older stores in

Table 15.

Store Cattle Account Summary.

	Per Farm (nearest £).			Per Cow.		
Average Number of Cows per Farm	20.5	20.8	21.7			
	1951-2	1952-3	1953-4	1951-2	1952-3	1953-4
	£.	£.	£.	£. s. d	£. s. d	£. s. d
Closing Valuation	1566	1874	2019	76. 7. 9	90. 1.11	93. 0.10
Sales	832	853	970	40.11. 9	40. 0. 2	44.14. 0
A. (Clos. Val. + Sales)	2398	2727	2989	116.19. 6	131. 2. 1	137.14.10
Opening Valuation	1502	1571	1828	73. 5. 4	75.10. 7	84. 4.10
Purchases	96	106	153	4.13. 8	5. 1.11	7. 1. 0
B. (Open.Val. + Purchases)	1598	1677	1981	77.19. 0	80.12. 6	91. 5.10
Value of Cattle Production: (A - B)	800	1050	1008	39. 0. 6	50. 9. 7	46. 9. 0
Other Returns (Credits):						
Milk	61	64	62	2.19. 6	3. 1. 6	2.17. 2
Service Fees	1	5	5	0. 1. 0	0. 4.10	0. 4. 7
Attested Herd Bonus	41	83	106	1.10. 3	3.19.10	4.17. 9
Hill Cattle Subsidy	49	54	26	2. 7. 9	2.11.11	1. 4. 0
Hill Cow Subsidy	-	-	143	-	-	6.11.10
Calf Subsidy	44	86	90	2. 2.11	4. 2. 8	4. 2.11
Bull Grant	11	13	9	0.10. 9	0.12. 6	0. 8. 3
Total Other Returns	197	305	441	9.12. 2	14.13. 3	20. 6. 6
Gross Value of Cattle Production	997	1355	1449	48.12. 8	65. 2.10	66.15. 6
Production Costs:						
Purchased Foods	11	15	19	0.10. 9	0.14. 5	0.17. 6
Home Grown Foods	293	309	318	14. 5.10	14.17. 1	14.13. 1
Grazing	110	107	121	5. 7. 4	5. 2.11	5.11. 6
Direct Labour	269	265	293	13. 2. 5	12.14.10	13.10. 1
Miscellaneous	35	36	44	1.14. 2	1.14. 7	2. 0. 7
Total Production Costs	718	732	795	35. 0. 6	35. 3.10	36.12. 9
(1) MARGIN	279	623	654	13.12. 2	29.19. 0	30. 2. 9
(2) CASH MARGIN (Margin less Val. Difference)	215	320	463	10. 9. 9	15. 7. 8	21. 6. 9
(3) SUBSIDIES (Excl. Att. Herd Bonus & Bull Grant)	93	140	259	4.10. 8	6.14. 7	11.18. 9
(4) CASH MARGIN (Less Subsidies)	122	180	204	5.19. 1	8.13. 1	9. 8. 0
(5) ATTESTED HERD BONUS AND BULL GRANT	42	96	115	2. 1. 0	4.12. 4	5. 6. 0
(6) CASH MARGIN (Excl. Subsidies, Bonus and Bull Grant)	80	84	89	3.18. 1	4. 0. 9	4. 2. 0
(7) SUBSIDIES AS % OF CASH MARGIN	43	44	56	-	-	-
(8) ATTESTED HERD BONUS & BULL GRANT AS % OF CASH MARGIN	20	30	25	-	-	-

the third. The prices received for calves and also for stores 12-18 months old were again higher in the third than in the second year. Purchases of cattle were comparatively few throughout, but an increase was noticeable in numbers of cows and calves purchased, and prices of practically all classes of cattle purchased showed a general rise.

The following table shows the average numbers of and prices received for cattle sold. It is also noticeable that an increasing number of calves

Table 16.

Average Sale Prices of Cattle, and Average Numbers Sold Per Farm.

	Average Number Sold per Farm.			Average Sale Price.		
	1951-2	1952-3	1953-4	1951-2	1952-3	1953-4
				£. s	£. s	£. s
Cows	3.4	3.3	2.3	35.12	41.11	51. 9
Bulls	0.6	1.1	1.0	78. 5	64. 9	81. 5
Calves 0 - 6 months	1.4	1.6	2.8	15. 8	21. 5	26. 1
" 6 -12 "	0.7	0.3	0.5	38.17	47. 0	47.11
Other Cattle 12-18 months	8.4	5.0	6.8	38.11	46.17	51. 6
" " 18-24 "	2.5	2.5	2.4	39.16	54. 7	54. 4
" " 24-30 "	4.3	3.2	3.0	41. 9	52.19	58. 7
" " 30-36 "	0.4	0.4	0.4	42.12	62.17	60.14

were sold during the period at a rapidly rising price whilst the numbers of other cattle sold were slightly reduced. Many farmers have, in recent years, shown a preference for selling an increasing proportion of their spring-born calves in the following autumn. In this way they reduce the difficulty of finding sufficient winter keep and claim the calf subsidy at 6 months rather than at 9 months. The question whether this practice is more profitable than selling at 18 months or 2 years is discussed in more detail later.

In addition to the returns from sales and from an appreciation in the value of cattle during the year, there were "other returns", which included incidentals such as the value of surplus milk sold or used in the farmhouse, service fees, the Attested Herd Bonus and Bull Grants to assist in the establishment of T.B.-free herds and the production of high-quality stock, and the different subsidies intended as direct aids to cattle rearing on upland farms. The total of all these "other returns" increased very substantially in 1952-3 and again in 1953-54. The Attested Herd Bonus and the Hill Cow Subsidy were the main contributors to this increase. During its year of introduction, 1953-4, the Hill Cow Subsidy amounted to £143 per farm or about £6.10.0 per cow. Its introduction automatically reduced the amount of the Hill Cattle Subsidy, since farmers could not claim both subsidies on the same animals. The Hill Cow Subsidy had a broader application and could be claimed on some farms even though they were not eligible for the Hill Cattle Subsidy. The increase in the Attested Herd Bonus is an indication of the increasing number of farms which were becoming Attested. The value of the Calf Subsidy in 1952-53 was almost double what it

was in 1951-52 since, at the later date the subsidy was payable on heifer- as well as on steer-calves.

The sum of the value of cattle production and the "other returns" gives what we have termed the "gross value of cattle production" and it is seen from the above table that this increased very appreciably in 1952-53 but to a much smaller extent in 1953-54.

The production costs, consisting very largely of hand-fed food and labour costs, showed a comparatively small increase during the period from £718 per farm in 1951-52 to £795 per farm in 1953-54. Hand-fed foods amounted to over 40 per cent of all the production costs in each year and showed a steady increase during the period. Direct labour costs accounted for between 35 and 40 per cent of the production costs and the cost of grazing for about 15 per cent. Miscellaneous costs included such items as transport and marketing, vet and medicines, depreciation of equipment and rent of buildings, each of these groups amounting to roughly one-third of all miscellaneous costs.

The difference between the gross value of cattle production and the production costs represents the margin which, in effect, is the profit which could be realised if all the cattle were sold at the end of the accounting year. The average margin per farm increased from £279 in 1951-52 to £623 in 1952-53 and again to £654 in 1953-54. The average number of breeding cows remained roughly the same throughout the period. The average margin per cow, therefore, showed the same trend as the average per farm. It increased from about £13.10s. in 1951-52 to about £30 in both 1952-3 and 1953-4. It has already been indicated that these changes were the result on the one hand of increased prices of stores during 1952-3, which greatly inflated the valuation difference in that particular year, on the other of an upward movement in production costs throughout the period. The margin, however, is not all realized in cash since the breeding herd has to be retained and a large proportion of stores are kept on beyond the end of the financial year. To arrive at the cash margin realized it is therefore necessary to deduct the valuation difference from the margin. This cash margin showed a marked increase over the period as a result of increased value of sales, increased subsidies, and an increased number of farms claiming the Attested Herd Bonus; the average was £215 per farm or about £10.10s. per cow in 1951-52, but by 1953-54 these amounts had been more than doubled. The Hill Land Subsidies (namely the Hill Cow, Hill Cattle and Calf Subsidies) alone amounted to 43, 44 and 56 per cent of the cash margin for the successive years of the survey and, in addition, the value of the Attested Herd Bonus and Bull Grant amounted to between 20 and 30 per cent. In effect 63, 74 and 81 per cent of the cash margins during the successive years consisted of subsidies, bonuses and grants. It must be realized, however, that the farmers claiming the Hill-Cow and Hill-Cattle Subsidies may have to spend up to 40 or 60 per cent of them on improving the land, a process from which the sheep and other

enterprises will benefit as well as the store cattle. The store cattle have, therefore, been charged only an appropriate share of such expenditure on improvements. Without the various subsidies, bonuses and grants, the farmers' cash margin would have been very meagre, amounting to between about £80 and £90 per farm or to only about £4 per cow. The value of the subsidies, bonuses and grants amounted to only 9 per cent of the average value of cattle carried in 1951-52 but it increased to 14 per cent in 1952-53 and to 25 per cent in 1953-54.

At present, the margin from store cattle production appears to be satisfactory. Under the present balance of payments conditions it is essential that we produce as much food as possible at home and therefore some encouragement and assistance in the form of subsidies and grants are essential and are likely to be continued for some time. But, at the same time it is essential that a policy of increased efficiency and decreased costs should be pursued, so as to alleviate the present heavy burden on the taxpayer. It is likely, therefore, that the subsidies, sooner or later, will be reduced. The store cattle rearer must therefore consider ways and means of cutting his costs and/or increasing his income. Taking the average results for our sample of farms there is, generally speaking, not much room to reduce costs per cow. Some progress might be made in this direction by more intensive use of grassland. It appears that on many of the better land farms heavier manuring of grassland would permit of more intensive stocking. It has also been suggested that it may be possible, through heavier winter-feeding, to increase the milk yield of the Hereford cow thereby enabling it to suckle two calves rather than one. Whilst it is admitted that one calf does not make full use of its dam's milk it is extremely doubtful whether improved winter-feeding will result in sufficient milk to support two calves. Even if it did other difficulties would arise. An extra calf would call for considerably more labour for the suckling would have to be supervised, the calves reared would almost certainly be of inferior quality and, furthermore, there would be the problem of finding additional calves of the right type. It is very uncertain, therefore, whether such a scheme would be practicable and would be justified on economic grounds.

Variations in Costs, Production and Cash Margins.

The store-raising enterprises studied were pursued under varying conditions of farm size, altitude, soil quality, herd size, farm organization, and quality of management; and like all other farming enterprises they were influenced to no small degree by the vagaries of the weather. It was to be expected, therefore, that the level of costs, the value of cattle production, the level of credits and hence the margins and cash margins per cow would vary considerably. The range is shown in the followibg table:-

Table 17.

Lowest and Highest Costs, Production, Margins and Cash Margins per Cow.

Year.	Costs.		Production.		Credits.		Margin.		Cash Margin.	
	L	H	L	H	L	H	L	H	L	H
	£.	£.	£.	£.	£.	£.	£.	£.	£.	£.
1951-52	24	66	26	93	3.1	18.9	- 2.2	+ 37.6	- 34.3	+ 40.3
1952-53	26	77	27	77	7.1	25.9	+ 3.1	+ 53.6	- 19.3	+ 35.8
1953-54	28	52	28	67	6.7	29.2	+ 9.8	+ 56.7	- 4.3	+ 46.2

L = Lowest. H = Highest.

During the successive years of the period under study the general tendency was for a slightly heavier concentration of farms in the £35 - £45 per cow cost-group, with a reduction in the second year in the number in the over £45 group and in the third year in that in the under £35 group. Increased prices of stores in 1952-53 resulted in an increased number of farms in the higher-production and higher-margin groups during that year. These increased prices together with the introduction of the Hill-Cow Subsidy contributed largely to the movement of more farms into the higher-margin groups in 1953-54.

The sum total of the various subsidies, grants and bonuses, per cow, varied for individual farms since not all farms qualified for all these credits, not all the cattle qualified for all subsidies, and the value of the subsidies themselves changed during the period. The following table shows the number of farms claiming the different subsidies and grants.

Table 18.

Number of Farms receiving different Subsidies and Grants.

Year.	Attested Herd Bonus.	Subsidies.			
		Hill Cattle.	Hill Cow.	Calf Subsidy.	Bull Grant.
	No.	No.	No.	No.	No.
1951-52	7	12	0	26	5
1952-53	21	14	0	28	7
1953-54	25	13	23	27	7

The rapid increase in the number of attested herds is illustrated in column 2. Roughly one-half the farms in the sample were eligible for the Hill Cattle Subsidy, but almost all farms were eligible for the Hill Cow Subsidy when it was introduced in 1953-54. The reason for this is that farmers with no "hill-land" can qualify for the Hill-Cow Subsidy.

Both subsidies could not be claimed for the same animal and therefore,

since the value of the Hill Cow Subsidy was so much greater, the Hill Cattle Subsidy, measured on a per cow basis, was naturally reduced in 1953-54. This is illustrated in the following table, which shows the distribution of farms according to the value (measured on a per cow basis) of the different Subsidies claimed. The very low value of the Hill Cow Subsidy for some farms is explained by the fact that the ultimate payment depends on the proportion of "good land" to "rearing land" and on the volume of milk sold. On the other hand the value of the Calf Subsidy was over £5 for some farms because they purchased some calves for rearing. The per year figure is also influenced by any changes in numbers of cows between the opening and closing valuations.

Table 19.

Distribution of farms according to value of Subsidies per Cow.

	Hill-Cattle Subsidy.			Hill-Cow Subsidy.			Calf Subsidy.		
Year.	£0-£3	£3-£6	£6 and over.	£0-£5	£5-£8	£8-£10	£0-£3	£3-£5	£5 and over.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
1951-2	1	8	3	-	-	-	23	3	0
1952-3	1	10	3	-	-	-	4	20	4
1953-4	7	6	0	3	5	15	2	19	6

Comparison of High- and Low-Margin Farms.

In order to expose the physical and management factors responsible for the differences in margins, a comparison was made of the average results

Table 20.

Value of Production, Costs and Margin (exc. Credits) per Cow.

	1951-52.		1952-53.		1953-54.	
	High-Margin.	Low-Margin.	High-Margin.	Low-Margin.	High-Margin.	Low-Margin.
Aver. Size of Farm	326	209	340	213	293	212
Aver. No. of Cows	23.3	14.3	22.5	14.6	21.4	17.8
	£. s. d	£. s. d	£. s. d	£. s. d	£. s. d	£. s. d
Cattle Production	46. 6. 5	28.18. 1	59.11. 6	35.14. 5	58.18. 7	35. 7. 9
Production Costs:						
Food - Purchased	0. 4. 4	0. 8. 0	0. 8. 8	3. 0.11	0.16.10	1. 1. 5
- Home-grown	13. 0. 9	12. 8. 6	14.13. 9	14. 5. 6	12. 3. 9	14.12. 5
Grazing	5.14. 1	5. 5.11	5. 2.10	5. 3. 8	5. 5. 1	5. 2. 9
Labour	11. 7.11	17. 2. 1	11. 6.11	16. 2.11	13. 0. 1	16. 9.11
Miscellaneous	1. 3. 5	1.19. 4	1.11. 9	1.18. 4	1. 4.10	2. 4. 3
Total Costs	31.10. 6	37. 3.10	33. 3.11	40.11. 4	32.10. 7	39.10. 9
Margin (ex.Credits) ±	+14.15.11	- 8. 5. 9	+26. 7. 7	- 4.16.11	+26. 8. 0	- 4. 3. 0
Margin (ex.Credits) for all farms	£4. 0. 0		£15. 6. 3		£9.16. 3	
Other Cattle (in cow units) per cow	0.72	0.74	0.72	0.65	0.8	0.7
	£.	£.	£.	£.	£.	£.
Purchases per Cow	3.4	3.8	5.3	5.0	2.7	4.3

for the 5 farms with the highest and the 5 with the lowest margins excluding credits. Although such credit items as milk used and sold and the various subsidies and grants contribute in different degrees to the incomes and margins made, they have been omitted for the purpose of this comparison, and the choice of farms has been based entirely on the margins excluding credits. Owing to the rapidly changing fortunes of certain farms during the three years only 3 of those included in each of the two groups were identical throughout the period.

Results according to size of the breeding-herd.

The above table shows that in each of the years the high-profit farms were, as a group, appreciably larger in size than the low-profit farms and they had larger breeding-herds. As was to be expected, taking all the farms in the sample, the size of herd increased generally with the size of farm, but there was only a general and indistinct tendency for the Margin (exc. credits) per cow to increase with increasing size of herd. Such small relationship as existed between this margin and the size of breeding herd, can be best illustrated by the following table:-

Table 21.

Average Margins (excl. credits) per cow according to size of herd.

£'s per Cow.

Size of Breeding Herd.	1951-52. No. of Farms.	1951-52. Margin.	1952-53. No. of Farms.	1952-53. Margin.	1953-54. No. of Farms.	1953-54. Margin.
10 - 14	7	3.1	6	4.5	4	2.2
15 - 19	8	- 0.4	10	13.1	9	13.2
20 - 29	7	6.3	7	19.3	10	5.2
30 & over	4	6.1	5	18.4	4	15.9

When both total costs and the cost of labour per cow were plotted according to the size of breeding herd they presented an irregular pattern, although both items declined generally with increasing size of herd. The cost of food per cow varied from farm to farm and, naturally, showed no relationship to size of herd: neither did the total of miscellaneous costs. It can, therefore, be said that, mainly because of the economies in labour that result from an increasing scale of production, total costs per cow tended to decline to a certain extent with increasing size of herd. The value of production per cow, on the other hand, showed no consistent relationship to size of herd. The value of production is largely a function of the quality of the land and of the management as reflected in the quality of the grassland, the breed and quality of the animals reared, their age when sold, the date and place of sale and the prices received for them. It might be expected that the quality of management and hence the value of production per cow would improve with increasing size of herd, but this was not true of our sample of

farms. In consequence, there was no very significant relationship between the margin (exc. credits) per cow and the size of herd.

It is shown in Table 22 that the average value of cattle production per cow for the low-margin farms was only about 60 per cent of that for the high-margin group. Apart from those mentioned above, other factors

Table 22.

Average Value of Cattle Production Per Cow.
5 High- and 5 Low-Margin Farms.

	1951-52.		1952-53.		1953-54.	
	High.	Low.	High.	Low.	High.	Low.
	£.	£.	£.	£.	£.	£.
Valuation Difference	7.5	6.8	20.2	4.9	12.0	3.2
Sales	42.2	25.9	44.7	35.9	49.6	36.5
Total	49.7	32.7	64.9	40.8	61.6	39.7
Purchases	3.4	3.8	5.3	5.1	2.7	4.3
Production per Cow	46.3	28.9	59.6	35.7	58.9	35.4

influencing the value of production per cow are the number of other cattle carried per cow, the relative prices received for the different categories and the number of each category sold. When all other cattle are expressed in cow-units, as in Table 20, then it appears that in 1951-52 the low-margin farms, as a group, were very slightly more heavily stocked with other cattle than the high-margin farms; but in 1952-53 and 1953-54 the high-margin farms were more heavily stocked to the extent of 11 and 14 per cent respectively of the other cattle carried by the low-margin farms.

Table 23 shows the numerical and monetary composition of sales for the high- and low-margin groups. In the first two years the high-margin farms sold relatively more cattle per cow than the low-margin group, and slightly fewer in 1953-54, but the value of sales per cow was considerably higher for the high-margin group in each of the three years. Approximately half the cattle sold by the high-margin group consisted of stores aged 12-18 months. Whilst stores 12-18 months old were also the most important category sold on the low-margin farms, calves of 0-6 months and stores of 2 years and over figured more prominently in the sales of this group than they did in those of the other. The high-margin group received higher prices for almost all categories of cattle, but it was in the sale of stores aged 12-18 months that they achieved the greatest advantage in price. The average prices received for store cattle vary mainly according to their breed, quality, condition, and age. All farms in our sample bred and reared only Hereford cattle, for which normally the highest prices are paid. Generally speaking, the older the animal the higher its price; but stores of 12-18 months, practically all of which are sold in the autumn, can, not infrequently,

Table 23.

Composition of Sales Per Cow.

	1951-52.				1952-53.				1953-54.			
	High-Margin.		Low-Margin.		High-Margin.		Low-Margin.		High-Margin.		Low-Margin.	
	Cattle Sold.	Value of Sales.	Cattle Sold.	Value of Sales.	Cattle Sold.	Value of Sales.	Cattle Sold.	Value of Sales.	Cattle Sold.	Value of Sales.	Cattle Sold.	Value of Sales.
	No.	£.	No.	£.	No.	£.	No.	£.	No.	£.	No.	£.
Total	1.04	42.2	0.84	25.9	0.94	44.7	0.84	35.9	0.90	49.6	0.92	36.5
	%		%		%		%		%		%	
Cows	14	5.0	17	3.9	20	7.3	18	4.6	16	7.0	19	6.7
Bulls	2	1.8	-	-	3	2.2	5	4.3	4	3.1	2	1.8
Calves 0 - 6 months	5	0.3	8	0.5	4	0.4	20	5.0	1	-	11	2.1
" 6 - 12 "	1	0.3	-	-	-	-	-	-	1	-	4	1.2
Cattle 12 - 18 "	55	24.4	17	4.2	53	25.4	34	11.4	46	23.0	27	9.6
" 18 - 24 "	11	4.6	18	5.3	11	5.0	-	-	14	7.0	19	6.5
" 24 - 30 "	12	5.8	32	9.1	8	3.9	23	10.6	18	9.5	16	7.3
" 30 - 36 "	-	-	8	2.9	1	0.5	-	-	-	-	2	1.3
Total	100		100		100		100		100		100	

fetch higher prices than those of 18-24 months which are sold in the following spring. This is rather surprising since those sold in the spring carry the additional expense of wintering.

Table 24.

Average prices per head of Cattle sold.

	1951-52.		1952-53.		1953-54.	
	High-Margin.	Low-Margin.	High-Margin.	Low-Margin.	High-Margin.	Low-Margin.
	£. s	£. s	£. s	£. s	£. s	£. s
Cows	36. 9	30.19	42. 8	41. 4	57. 2	58. 9
Bulls	105. 0	-	83.13	103.13	82. 0	82.10
Calves 0 - 6 months	10. 7	6.10	8. 2	21.17	-	20. 8
" 6 - 12 "	32. 0	-	-	-	-	34.15
Cattle 12 - 18 "	42.17	29.19	50.10	39.12	55.16	42.16
" 18 - 24 "	40.16	34. 7	51. 0	-	53. 0	41. 3
" 24 - 30 "	45. 8	36. 7	54. 4	55.10	60. 0	49.17
" 30 - 36 "	-	41.16	60. 0	-	-	59. 0

Another factor which influences the value of the animals when sold is their physical condition and this must depend, to a large extent, on the quality of the pasture as determined by the quality of the land and by the managerial capacity of the farmer. It is not possible to compare, on paper, the quality of the land and pasture of individual farms, but it can be expected that the proportion of rough grazings to total pasture varies generally with these qualities.

It was, in fact, found that, apart from 1952-53, the high-margin or high-price farms, as a group, had a higher proportion of rough grazings to total pasture than the low-margin or low-price farms.

Results according to Rental per acre.

Some interesting results were obtained by grouping all the farms in the sample according to the rent or rental value per acre. These are illustrated in Table 25. It must be stated that, in each year, at least 3 of the 5 high-margin farms had rents of over 15/- per acre and at least 3 of the low-margin farms had rents of less than 15/- per acre.

The average rent or rental value per acre of farms in the sample varied from 6/- to 34/- and the farms have accordingly been allocated to six different groups. It will be observed that the proportion of rough grazings to total grazings declined with increasing rental, as was to be expected, since rent should reflect the quality of the land. The value of the Hill Cattle and Hill Cow Subsidies, when expressed on a per cow basis, declined with increasing rental since payment of these subsidies is dependent on the proportion of rough grazing and of 'rearing land' to 'other pasture'.

For the first three rent groups in 1951-52 the average price received for stores aged 12-18 months increased with increasing rent, but

Table 25.

Analysis of Results according to Rent per acre.

Average Rent per acre.	No. of Farms.	Per cent Rough to total Grazings	Subsidies per Cow. Hill Cow.	Subsidies per Cow. Hill Cattle.	Price per head for Cattle 12 - 18 months sold.	Production per Cow.	Total Costs per Cow.	Margin (exc. Credits) per Cow.
1951-52:-		%	£. s	£. s	£. s	£. s	£. s	£. s
Under 10/-	4	61	-	5. 7	36.12	34.18	35.18	- 1. 0
10/- to 14/11	5	53	-	4.10	37. 8	43. 0	39. 1	3.19
15/- " 19/11	6	30	-	2.19	40.18	37. 1	34.11	2.10
20/- " 24/11	5	26	-	1. 9	39. 1	42. 3	36.11	5.12
25/- & over	6	19	-	-	38. 1	38. 0	31.15	6. 5
1952-53:-								
Under 10/-	4	58	-	5. 3	41. 2	40. 7	35. 7	5. 0
10/- to 14/11	5	53	-	3.18	48. 0	44.12	37. 9	7. 3
15/- " 19/11	8	31	-	3.11	47. 9	52.19	35. 2	17.17
20/- " 24/11	5	26	-	1.14	48.17	53.13	35.19	17.14
25/- & over	6	20	-	-	48. 8	53. 8	33. 0	20. 8
1953-54:-								
Under 10/-	4	53	7.16	3. 1	44. 6	38.16	36. 3	2.13
10/- to 14/11	5	46	7. 7	1.13	48.11	39. 2	32.14	6. 8
15/- " 19/11	6	32	7. 1	1.16	51.11	49. 3	38.10	10.13
20/- " 24/11	6	23	8.17	0.12	53.13	48.10	40. 6	8. 4
25/- & over	6	20	3.10	-	53.19	51. 6	35. 8	15.18

these prices declined again for the highest-rent groups. In 1952-53, apart from the comparatively low average price per head received for this class of store sold by the lowest-rent group of farms, the average prices per head were fairly consistent for all groups, and hardly suggested that a direct relation existed between price of stores and rent. But in 1953-54 the average price of stores aged 12-18 months increased distinctly for each successive rent-group. It is probable that the increased demand for beef-stores in 1952-53 resulted in less attention being paid to their quality, and that similar prices were received by all rent-groups excepting the lowest. The figures for 1951-52 and 1953-54 indicate that the quality of the land and pasture have some bearing on the sale price of store animals. These factors can influence the progress of the stores during their early stages of growth, which in turn contribute, in no small degree, to their conformation and performance in later stages and hence to their prices. Of equal importance, however, is the quality of the farmer himself as a farm manager and as a breeder of cattle. Good cattle dealers and feeders have an eye for animals which have the desired conformation and the capacity to put on weight quickly, and much depends on the rearer's ability to choose the right breed and type of animal to breed from and his skill in caring for his animals during the earlier stages of growth. It needs to be stated that some upland farmers prefer not to send their stores to the hills, even though they thereby lose the Hill Cattle Subsidy on these animals,

because they believe that their final condition is so much less good than it is when they are grazed on the better lowland pasture and that more is thus lost in the sale price than would be gained in subsidy.

Other points of interest illustrated in Table 25 are:-

(a) With the exception of 1951-52, when its value was irregular, production per cow increased generally with increasing rental per acre.

(b) There was no distinct relation between the total costs per cow and the rental per acre.

(i) With the possible exception of the highest- and lowest-rent groups there was no relation between the cost of food and the rent per acre. One might expect the cost of food to decline with increasing rent, owing to the improved quality of home-grown foods which would necessitate smaller rations.

(ii) There was a very broad tendency for grazing costs per cow to increase with increasing rentals. This may be attributed to the fact that rent was the largest single element in the cost of grazing.

(c) The margin (excluding credits) per cow increased generally with increasing rental.

The calf subsidy, since it did not vary much for the different rent groups in each of the three years, and the Hill Cow Subsidy, being similar in 1953-54 for all except the highest rent group, both expanded the margin by roughly similar amounts for all rent groups. The Hill Cattle Subsidy, declining distinctly for all rent groups in each of the three years, helped to bring the margin for the lower more into line with those for the higher-rent groups.

Food and Other Costs.

To proceed with the analysis of the causes of differences in margins between farms it is necessary to examine next the differences in costs of production for the high- and low-margin groups. Except in 1951-2, the cost of food per cow was distinctly higher for the low-margin than for the high-margin farms, despite the fact that in the two later years the high-margin group carried more other cattle per cow. It is therefore clear that the high-margin farms practised far more economic feeding in the second and third years.

It is shown in Table 26 that hay and oat sheaves were the most important items of food cost. Apart from the first year, the cost per cow of oat sheaves was less for the high-margin farms; but there was little difference between the cost of hay per cow for both groups. An examination of costs per cow alone, however, does not help to show how the economy in feeding was achieved. To do this it is necessary to examine the quantities fed and, to eliminate differences in numbers of "other cattle" carried, to measure these quantities on a per cow-unit basis. Apart from the first year, the high-margin farms fed appreciably less oat sheaves, depended to a lesser extent on purchased compounds and showed some saving in the use of hay. For the first and second year they made more use of the cheaper foods - straw and roots. It was thought that the economy in feeding achieved by the high-margin group may have been partly due to their being situated, as a whole, on the better class

Table 26.

Analysis of Food Costs and Consumption.

A. Costs Per Cow.

	1951-2.		1952-53.		1953-54.	
	High-Margin.	Low-Margin.	High-Margin.	Low-Margin.	High-Margin.	Low-Margin.
	£. s. d	£. s. d	£. s. d	£. s. d	£. s. d	£. s. d
Purchased Concentrates	0. 4. 4	0. 8. 0	0. 8. 8	3. 0.11	0.16.10	1. 1. 5
Home-grown Grain	1. 7. 8	0. 7. 2	1.18. 1	0. 1.10	1. 0. 4	-
Oat Sheaves	2.12. 7	2.12. 0	2.18. 7	5.19. 1	2.13. 9	4.10. 8
Straw	1. 9. 6	0.17. 2	1.13. 1	0. 7.11	0.16. 7	0.17. 5
Hay	5. 9. 1	7. 7. 5	6. 6. 3	6.14. 1	7. 1. 3	6.15.11
Silage	-	0. 8. 2	-	0. 8. 4	-	0. 5. 8
Roots	2. 1.11	0.16. 7	1.17. 9	0.14. 3	1.11.10	2. 2. 9
Total	13. 5. 1	12.16. 6	15. 2. 5	17. 6. 5	13. 0. 7	15.13.10

B. Quantities Consumed (cwt. per Cow Unit).

Purchased Concentrates	0.08	0.11	0.13	1.26	0.25	0.34
Home-grown Grain	1.37	0.33	1.59	0.08	0.78	-
Oat Sheaves	5.91	5.46	5.91	12.69	3.30	9.45
Straw	7.10	4.22	7.85	1.99	4.09	4.59
Hay	15.52	19.60	15.26	17.05	15.85	16.28
Silage	-	0.48	-	0.50	-	0.33
Roots	13.61	4.17	9.28	3.64	8.50	12.16

of land, a fact which should have resulted in a shorter winter period, better quality home-grown foods, and a smaller proportion of sheep to cattle. In our sample of farms, however, no relationship existed between food-cost per cow-unit and the general quality of the land as reflected in its average rental. The following table gives typical rations for the breeding cows, 6-12 month calves and replacement heifers on the high- and low-margin farms, during the winter period. The winter period for breeding cows, replacement heifers and 18-month stores is normally about 4½-5 months and for calves 6-12 months old it is about 6 months.

Table 27.

Average Winter-Feeding Rates.
Lb. per Head per Day.

Food.	Breeding Cows.		6 - 12 month Calves.		18-24 month Replacement Heifers.	
	High-Margin.	Low-Margin.	High-Margin.	Low-Margin.	High-Margin.	Low-Margin.
Purchased Concentrates	-	¼	-	-	*	-
Home-grown "	-	-	1½	-	-	-
Oat Sheaves	2 - 3	9	5	6½	-	7¼
Hay	9	10½	6	10	10½	10½
Straw	8	2¼	-	-	8	-
Roots	3 - 4	-	7½	4	-	-

* 1 farm feeding 1 lb. per day.

The level of feeding was almost incredibly low especially for the breeding cows and replacement heifers. It is surprising that these cattle could have produced calves on rations so meagre and so low in protein. However, they occasionally picked up a little foggage and were fed an additional quantity of sprigg oats and sometimes some cake for a few weeks before calving. The 18 month-old replacement heifers were fed, it appears, only enough to enable them to survive, since they had the following summer, with its flush of grass, to recuperate and to assume healthy physical proportions. When 18-24 months steers and heifers were kept for sale the following spring they were fed a slightly heavier ration of hay and/or straw than the replacement heifers and, in addition, a fair quantity of oat sheaves and 10-14 lb. of roots.

Grazing costs per cow were remarkably similar in both the high- and low-margin groups in each of the three years.

Of all cost items, that of labour showed the greatest difference as between the two groups of farms. The average cost per cow for the successive years was, respectively, 50, 42 and 27 per cent higher for the low- than for the high-margin farms. It is probable that the differences were due mainly to differences in convenience of situation of farm buildings and of grazings. The cost of labour included that of the family as well as hired labour and it was not possible to say to what extent the latter was used in the store cattle enterprise. On average for all farms in the sample, however, roughly two-thirds of the labour available on the farm was family labour.

Selling at 6 or 18 months.

The provision of proper housing and of adequate winter keep of the right quality are very often serious problems on Welsh Hill farms. The relative abundance of rough and poor grazings provides some sustenance during the summer months, but next to nothing in the form of grazing and very little - and that of poor quality - in the form of hay during a long winter period. To overcome this winter feeding difficulty Welsh upland farmers, particularly in Brecon and Radnor, have, to an increasing extent during the past five years, been selling their calves at weaning i.e. at 6-8 months, instead of keeping them until they are yearlings, or, more commonly, 18 months old or thereabouts. It is claimed that this system is more profitable than the traditional one of selling at 18 months. It is proposed, with the use of partial budgeting, to assess what financial advantages there are in selling weaned calves instead of keeping them for another twelve months.

There are four important factors involved in this change-over:-

(1) Selling calves at six months sets free summer grazings, winter foods and buildings, and the number of breeding cows can thus be increased.

(2) Arising from (1) is the fact that more calves are available for sale. This poses the question how many additional cows need to be introduced to replace the calves sold in order to make the change a profitable one.

(3) The saving in winter food and the changes, if any, in the cropping involved.

(4) The relative prices that can be obtained for weaned calves and for 18-month stores.

Table 28 presents the estimated saving in food costs and changes in income brought about by this change in practice, assuming

(a) two different rates of replacement of cows for calves sold;
(b) two different prices of stores and of weaned calves respectively.

It has been assumed that the new practice does not need any new buildings or extra labour. The Hill Cattle Subsidy has been omitted because not all farms are eligible for it and because it is not likely to affect the results to any great extent. It is also assumed that the calves are sold unpunched i.e. that they still carry the Calf Subsidy. The results are based on a breeding herd of 20 cows rearing under the traditional system, and it is assumed that cows are replaced on average after 5 years in the herd. The winter-food costs per head are based on the average costs obtained from about 60 store rearing farms in Brecon and Radnor in 1954-55.

I. Assuming 2 additional cows for every 3 calves sold.

With a breeding herd of 20 cows, under the traditional system, the winter carry of cattle would include, in addition to the breeding cows, 4 three-half-year to 2 year-old heifers and 20 calves of 6-12 months, 4 of which

Table 28. Changes in Winter Food-Costs and Revenue.

	SELLING AT 18 MONTHS.			SELLING AT 6 MONTHS.					
				3 calves sold = 2 additional cows.			3 calves sold = 1 additional cow.		
	STOCKING AND FOOD-COSTS IN WINTER.								
	No.	Food-Cost per head.	Total Food-Cost.	No.	Food-Cost per head.	Total Food-Cost.	No.	Food-Cost per head.	Total Food-Cost
		£.	£.		£.	£.		£.	£.
Breeding Cows (inc. in-calf heifers)	20	10	200	30	10	300	25	10	250
18 month Heifers	4	6.5	26	6	6.5	39	5	6.5	32.5
6-12 " Calves for replacements	4	10	200	6	10	60	5	10	50
6-12 " " " sale	16			-	-	-	-	-	-
TOTAL WINTER FOOD-COSTS			426			399			332.5
SAVING IN WINTER FOOD-COSTS			-			27			93.5
	REVENUE.								
	Number and Value.	Col. 1a Selling at £50	Col. 1b Selling at £55.	Number and Value.	Col. 2a Selling at £35.	Col. 2b Selling at £40.	Number and Value.	Col. 3a Selling at £35.	Col. 3b Selling at £40.
		£.	£.		£.	£.		£.	£.
18 months stores	16 @ £50	800	-	-	-	-	-	-	-
18 " "	16 @ £55	-	880	-	-	-	-	-	-
6 " calves	-	-	-	24 @ £35	840	-	20 @ £35	700	-
6 " "	-	-	-	24 @ £40	-	960	20 @ £40	-	800
Barren Cows	4 @ £30	120	120	6 @ £30	180	180	5 @ £30	150	150
Calf Subsidy	20 @ £7.5	150	150	6 @ £7.5	45	45	5 @ £7.5	37.5	37.5
Hill Cow Subsidy	20 @ £10	200	200	30 @ £10	300	300	25 @ £10	250	250
Attested Herd Bonus - Cows	20 @ £1	50	50	30 @ £1	51	51	25 @ £1	42.5	42.5
- Calves	20 @ £1			6 @ £1			5 @ £1		
- Calves	20 @ 10/-			30 @ 10/-			25 @ 10/-		
TOTAL REVENUE	-	1320	1400	-	1416	1536	-	1180.0	1280.0
					Compared with Col.			Compared with Col.	
					1a	1b		1a	1b
					£.	£.		£.	£.
CHANGE IN REVENUE					+ 96	+ 16		- 140	- 220
SAVING IN FOOD-COSTS					+ 27	+ 27		+ 93½	+ 93½
CHANGE IN INCOME					+ 123	+ 43		+ 46½	+ 126½
CHANGE IN INCOME (exc. Hill Cow Subsidy) ...					+ 23	- 57		- 96½	- 176½

would be kept for replacements and the others reared and sold at 18-20 months. If 16 of the calves are sold at weaning and if, for every 3 calves sold, 2 additional cows are brought into the breeding herd the winter carry becomes 30 cows and 6 in-calf heifers, six 18-24 months heifers and 6 heifer calves of 6-12 months for replacement purposes. The table shows that the change-over to selling weaned calves results in a saving of £27 in the winter food-costs. There are now 8 more calves and 2 more barren cows for sale, and 10 more cows to claim the Hill Cow Subsidy and the Attested Herd Bonus, if the farm qualifies. But there are fewer calves claiming the two half-yearly payments of the Attestation Bonus and only the 6 calves kept for replacement claim the Calf Subsidy.

(a) If the average price obtained for weaned calves is £35 each and that for 18 month stores is £50, then the change-over results in an increased revenue of £96. Taking into account the saving of £27 in winter food-cost, there is an increased income of £96 + £27 = £123. But if the 18 month stores will fetch an average price of £55 then the increase in revenue through selling weaned calves is only £16, making for an increased income of only £43;

(b) If the weaned calves can be sold at an average of £40 apiece and the 18 month stores at £50 or £55, then the increased income is £243 and £163 respectively.

II. Assuming 1 additional cow for every 3 calves sold.

On this assumed rate of replacement, there are now 25 cows rather than 20, and 5 three-half-year heifers and 5 six-month calves to be kept over the winter period rather than 4 of each as under the traditional system. The saving in winter food-cost now amounts to £93.5. But, on the other hand, although there are more calves and barren cows for sale and more Hill Cow Subsidy accruing, the net result is a heavy loss of revenue at all the assumed levels and combinations of prices of stores and of weaned calves. The saving in food-cost reduces this loss; but only when the prices of calves are at £40 and those of stores at £50 does the net result show an increased income, and this amounts only to £53.5.

III. Assuming 1 additional cow for every 2 calves sold.

The results calculated on the basis of this assumption are not shown in the above table; but, if this rate of replacement is adopted, it is only when a price of £40 can be obtained for weaned calves that a change in practice results in an appreciable increase in income.

In the above calculations, the Hill Cow Subsidy was included as a source of revenue. If this subsidy cannot be claimed the financial advantage of selling calves at weaning and replacing every 3 calves sold with 2 breeding cows is reduced by £100. The only case where a small increase in income is shown, when only 1 additional cow is introduced for every 3 calves, is when the prices of calves and stores stand at £40 and £50 respectively, and even this is now reduced to merely £3.5. Under the replacement rate of 1 cow for every 2 calves, if the Hill Cow Subsidy is excluded, the change-over results in an

additional income only if the calves can be sold at not less than £40 and if the stores will not fetch more than £50.

An assumed saving in winter food-costs was taken into consideration when estimating the changes in income brought about by a change in practice. It is extremely doubtful, however, whether such a saving actually occurs. On the majority of these livestock-rearing farms the system of farming is not very flexible, and it is not likely that any appreciable change in cropping would be attempted.

Tables 29-31 summarise the theoretical changes brought about under the varying replacement rates. It is assumed that the winter period for cows and heifers-in-calf is 150 days, that for 18-24 months replacement-heifers is 135 days and that for calves 6-12 months is 180 days. The consumption per head for the winter period has been taken as follows:-

Table 29.

Food consumption per head.

	Breeding Cows.		18 - 24 month Replacement-Heifers		6-12 month Calves.	
	Per day.	150 days	Per day.	135 days	Per day	180 days
	lb.	cwt.	lb.	cwt.	lb.	cwt.
Hay	12	16	8	10	6	10
Straw	6	8	8	10	-	-
Oat Sheaves	5	6½	-	-	5	8
Oat Grain	-	-	-	-	1½	2½
Roots	4	5	6	7	8	13

If the winter carry is as in Table 28, total quantities consumed will be:-

Table 30.

Total Food Consumption.

	Selling at 18 months.	Selling at 6 months. 3 calves sold := 2 addit. cows	3 calves sold := 1 addit. cow	2 calves sold := 1 addit. cow.
	cwt.	cwt.	cwt.	cwt.
Hay	560	600	500	568
Straw	220	300	250	284
Oat sheaves	290	243	202	230
Oat grain	50	15	12½	15
Roots	398	285	237	274

Therefore a change in system to selling weaned calves would result in the following approximate changes in acreage under the three replacement rates of calves by cows. In arriving at these estimated acreages the yields per acre which have been used are: hay, 1 ton; oat sheaves, 18 cwt grain and 18 cwt of straw; roots, about 14 tons.

Table 31.

Changes in acreages.

3 Calves = 2 cows.			3 Calves = 1 cow.			2 Calves = 1 cow.		
Surplus.			Surplus.			Surplus.		
	cwt.	acres.		cwt.	acres.		cwt.	acres.
Oat Sheaves	47 =	$1\frac{1}{4}$	Hay	60 =	3	Hay	-	-
Oat Grain	35 =	2	Oat Sheaves	88 =	$2\frac{1}{2}$	Oat Sheaves	60 =	$1\frac{3}{4}$
Roots	107 =	$\frac{1}{3}$	Oat Grain	$37\frac{1}{2}$ =	2	Oat Grain	35 =	2
		$3\frac{1}{2}$	Roots	161 =	$\frac{1}{2}$	Roots	24 =	neg.
					8			$3\frac{3}{4}$
Required.			Required.			Required.		
Hay	40 =	2	Straw	30*		Straw	64*	
Straw	80*							
Acreage set free	=	$1\frac{1}{2}$	Acreage set free	=	8	Acreage set free	=	3

* To be purchased.

When 2 additional cows replace 3 weaned calves sold, little adjustment is needed; for the saving in hand-fed foods is small, and the change in summer stocking is not very much. The small reduction in cropping, if any, will set free land required as pasture to accommodate the small increase in cattle during the summer. When only 1 additional cow is introduced for every 3 calves sold, the quantitative saving in winter foods is appreciably more and the summer stocking appreciably less. There is therefore a considerable wastage of resources, unless the surplus foods are sold. With a replacement rate of 1 cow for every 2 calves sold the situation is rather similar to that arising under the first replacement rate. If it is assumed that there is no saving in winter food-costs, it is evident that the best results are obtained when every 3 calves sold are replaced by 2 breeding cows. Even if it is assumed that, under the second rate of replacement, there is a saving in winter foods and the estimated acres set free are devoted to growing oats for sale, the additional revenue from oats does not make the total change in income comparable with that achieved under the replacement rate of 2 additional cows for every 3 calves sold.

In conclusion it can be said that from a financial point of view, it appears to be advantageous to sell weaned calves provided that:-

(1) The replacement-rate of breeding cows for calves sold is adequate;

(2) The price received for weaned calves is relatively high compared with that of 18-month-old stores;

(3) The Hill Cow Subsidy can be claimed. If this subsidy cannot be claimed then the replacement-rate of breeding cows for weaned calves must be high.

The practice of selling at 6-8 months must not, therefore, be adopted without consideration of the circumstances of the individual farm and without

study/of the probable prices of calves and stores. It is less likely to be successful on lowland farms which do not qualify for the Hill Cow Subsidy and where the differences between the prices of calves and stores is likely to be greater than on the upland farms.

COSTS OF REARING.

An estimate was made of the costs of rearing the cattle through each six-monthly period of their lives. These figures were arrived at from estimates made by the farmer of the amount of food fed to each group of cattle (the breeding herd, yearlings, and two-year-olds etc.), and the time spent looking after each group. Home-grown foods were costed according to values representing the average cost of production for certain farms in Wales, and labour was costed at the statutory minimum rate per hour. Grazing costs were calculated according to a formula given in the Appendix. Since, in order to produce calves, the breeding herd must be kept for a whole year, the cost of the 0-6 months period was taken as the cost of the breeding herd for the year plus costs attributable directly to the calves. The various credits, all of which, except for the Attested Herd Bonus and the Hill Cattle Subsidy, were attributable to the breeding herd, were then deducted to give the net costs for each group. The Calf Subsidy was credited to calves of 0-6 months since, on many hill farms, varying numbers of spring-born calves are sold in the autumn and these qualify for the subsidy at 6 rather than at 9 months. The details of costs are given in Appendix C. The total and net costs per animal are summarised in Table 32. The cost of rearing the cattle from 12-18 months and from 24-30 months was only a fraction of the cost of rearing them from 6-12, 18-24, and 30-36 months because during the former periods the cattle, being Spring-born, were out on summer grass.

Table 32.

A. Total Costs of Rearing per Animal.

	Calves.		Cattle.				
Year.	0 - 6 months	6 - 12 months.	12 - 18 months.	18 - 24 months.	24 - 30 months.	30 - 36 months.	Total.
	£. s. d	£. s. d	£. s. d	£. s. d	£. s. d	£. s. d	£. s. d
1951-2	23. 0. 5	12.10. 8	2. 5. 9	9.14. 8	3.19.11	11.12. 3	63. 3. 8
1952-3	22. 9.11	10.15. 5	2. 5. 7	10.11. 3	3. 9. 5	11.13. 8	61. 5. 3
1953-4	26. 4. 4	11. 9. 3	2.17. 5	11.10. 1	3. 9. 3	13. 3. 7	63.13.11

B. Net Costs of Rearing per Animal.

	Calves.		Cattle.				
Year.	0 - 6 months.	6 - 12 months.	12 - 18 months.	18 - 24 months.	24 - 30 months.	30 - 36 months.	Total.
	£. s. d	£. s. d	£. s. d	£. s. d	£. s. d	£. s. d	£. s. d
1951-2	13. 2.11	12. 5. 1	1.16. 3	9. 8. 6	3.11. 6	11. 7. 3	51.11. 6
1952-3	6.15. 3	10. 1. 1	0.12. 7	9.16. 4	1.15.11	10.17. 0	39.18. 2
1953-4	4. 6. 4	10.10. 6	1. 0.10	10.10. 8	1. 7. 1	12. 7. 1	40. 2. 6

Total costs rose generally over the period, the cost of rearing to 3 years rising from £63.3.8 to £68.13.11 per animal. This was the result mainly of increases in the cost of food, labour, and also of herd depreciation. The increase in subsidies, however, caused a substantial fall in the net cost of rearing to 6 months, which dropped from above £13 to just over £4. The net cost of rearing to 3 years fell from nearly £52 to just above £40.

The relative total costs of different age-groups did not show any marked changes over the period. The 0-6 months' period, which included the cost of the breeding herd for the whole year, was the most expensive, its costs ranging from about £22 to £26 per animal. In the other six-monthly periods there was a marked difference between the costs for the summer and winter periods. Whereas the cost for the winter periods averaged from £10 to £13, that for the summer periods averaged from £2 to £4 only.

Hand-fed food and grazing was the largest cost-item, with labour the second largest. The two made up over three-quarters of the cost of all age groups. The quantities of food fed per animal are given in Table 33. The average consumption of home-grown concentrates by 30-36 months cattle was unexpectedly high in the first and last years. It must be stated that, over all farms, only a small number of cattle were kept to this age and many of these were sold as forward stores in the winter and early spring months.

Table 33.

Average Quantities of Hand Fed Foods per head.

	Purchased Concentrates.	Home-Grown Concentrates.	Oat Sheaves	Hay.	Straw.	Roots.
1951-2:-	lb.	lb.	cwt.	cwt.	cwt.	cwt.
Breeding Herd	15.6	38.8	4.2	15.4	10.3	12.6
Calves 6 - 12 months	25.0	287.9	3.4	15.9	0.7	15.1
Cattle 18 - 24 "	-	23.8	3.7	16.1	3.9	4.5
" 30 - 36 "	-	144.3	6.7	10.8	7.2	2.7
1952-3:-						
Breeding Herd	28.3	6.7	4.8	16.4	9.7	6.4
Calves 6 - 12 months	23.1	181.0	4.4	12.4	0.5	10.2
Cattle 18 - 24 "	1.9	15.7	3.9	14.6	5.6	7.1
" 30 - 36 "	2.8	-	4.6	22.2	2.3	2.0
1953-4:-						
Breeding Herd	25.3	8.7	2.9	18.3	8.3	7.1
Calves 6 - 12 months	28.6	189.1	3.4	14.0	-	11.8
Cattle 18 - 24 "	9.2	140.5	2.3	12.6	4.3	6.0
" 30 - 36 "	8.6	215.4	2.6	13.9	3.7	3.4

Grazing was the only 'food' cost incurred during the summer months and this showed no marked change over the three-year period.

APPENDIX A.

Table 1.

The Cattle Population of Wales (including Monmouth).
(000's).

Year.	Under 1 Year.		1 - 2 Years.		Over 2 Years.		Breeding Cows & Bulls.	Total.
	Male.	Female.	Male.	Female.	Male.	Female.		
1939	188		202		88		381	859
1940	191		72	115	39	45	382	844
1941	188		88	107	44	47	395	869
1942	61	124	60	115	40	50	410	860
1943	55	139	54	125	42	52	438	905
1944	56	137	49	138	42	63	453	938
1945	50	132	52	140	47	74	451	946
1946	46	122	49	129	47	73	466	928
1947	44	118	50	118	45	72	452	899
1948	58	143	45	108	48	66	472	940
1949	65	148	56	129	46	61	480	985
1950	68	143	63	134	50	71	482	1011
1951	57	128	61	128	51	75	461	961
1952	67	126	59	112	55	65	479	958
1953	78	149	66	123	56	62	485	1017
1954	82	149	75	136	51	61	505	1059

Table 2.

Age-Distribution of Cattle in Wales (including Monmouth).
(% of total).

Year.	Under 1 Year.		1 - 2 Years.		Over 2 Years.		Breeding Cows.	Total.
	Male.	Female.	Male.	Female.	Male.	Female.		
	%		%		%		%	%
1939	21.8		23.5		10.2		44.5	100
1940	22.7		8.5	13.7	4.6	5.3	45.2	100
1941	21.6		10.1	12.3	5.0	5.5	45.5	100
1942	7.1	14.4	6.9	13.3	4.6	5.8	47.9	100
1943	6.1	15.3	6.0	13.8	4.6	5.7	48.5	100
1944	5.9	14.6	5.2	14.7	4.5	6.7	48.4	100
1945	5.3	13.9	5.5	14.8	4.9	7.8	47.8	100
1946	4.9	13.1	5.3	13.8	5.0	7.7	50.2	100
1947	4.9	13.1	5.5	13.1	5.0	8.0	50.4	100
1948	6.1	15.2	4.8	11.5	5.1	7.0	50.3	100
1949	6.6	15.0	5.7	13.1	4.6	6.2	48.8	100
1950	6.7	14.1	6.2	13.2	4.9	7.0	47.9	100
1951	5.9	13.3	6.3	13.3	5.3	7.8	48.1	100
1952	7.0	13.1	6.2	11.7	5.7	6.8	49.5	100
1953	7.6	14.6	6.5	12.1	5.5	6.1	47.6	100
1954	7.7	14.1	7.1	12.8	4.8	5.8	47.7	100

Source: Agricultural Statistics of the United Kingdom.

APPENDIX B.

Store Cattle Account Summary - Per Cow Unit*.

	1951-52.	1952-53.	1953-54.
	£. s	£. s	£. s
Closing Valuation	43. 3	51.10	52. 7
Sales	22.17	24. 0	25.19
A (Closing Valuation + Sales)	66. 0	75.10	78. 6
Opening Valuation	41. 8	43. 8	48. 8
Purchases	2.12	2.18	4. 2
B (Opening Valuation + Purchases)	44. 0	46. 6	52.10
Value of Cattle Production (A - B)	22. 0	29. 4	25.16
Milk and Service Fees	1.14	1.18	1.15
Attested Herd Bonus, Subsidies and Bull Grant	3.15	6.10	9.19
Gross Value of Cattle Production	27. 9	37.12	37.10
Production Costs:			
Foods - Purchased	0. 5	0. 9	0. 9
- Home-Grown	8. 1	8.10	8. 9
Grazing	3. 1	2.19	3. 6
Direct Labour	7. 8	7. 6	7.16
Miscellaneous	1. 0	1. 0	1. 4
Total Production Costs	19.15	20. 4	21. 4
MARGIN	7.14	17. 8	16. 6
CASH MARGIN	5.19	9. 6	12. 7
CASH MARGIN (excl. Attested Herd Bonus, Subsidies and Grants)	2. 4	2.16	2. 8

* 'Other Cattle' were converted to cow-units on the same basis as that given in Appendix E for the sharing of grazing costs.

APPENDIX C.

COSTS OF REARING.

STORE CATTLE SURVEY 1951-52.

SPRING BORN CALVES REARED BY SUCKLING METHOD.

COSTS PER ANIMAL. Number of Farms = 26

Age Group.	Calves 0-6 months (Full Year Breeding Herd).	Calves 6-12 months.	Store Cattle 12-18 months.	18-24 months.	24-30 months.	30-36 months.
Cost Items:-	£. s	£. s	£. s	£. s	£. s	£. s
Purchased Meals	0. 5	0. 8	-	-	-	-
Home-grown concentrates	0. 4	1.12	-	0. 3	-	0.16
Oat Sheaves	1. 3	0.18	-	1. 0	-	1.16
Hay and Silage	3. 6	3. 6	-	3. 1	-	2. 7
Straw	1. 5	0. 2	-	0. 9	-	0.17
Roots and Green Fodder	1. 5	1. 9	-	0. 9	-	0. 5
Grazing	4. 6	0. 2	1. 1	0.10	2. 4	0.18
Total Foods & Grazing	11.14	7.17	1. 1	5.12	2. 4	6.19
Labour	8.13	4. 6	0.14	3.13	0.18	3.13
Sundry Costs	1. 1	0. 5	0. 8	0. 8	0.10	1. 0
Loss on Casualties	-	0. 3	0. 3	0. 2	0. 8	-
Depreciation on Breeding Herd	1. 8	-	-	-	-	-
Purchases of Calves	0. 4	-	-	-	-	-
Total Costs	23. 0	12.11	2. 6	9.15	4. 0	11.12
Credits:-						
Sales of Calves	1. 5	--	-	-	-	-
Milk not for Calf Rearing	3.12	-	-	-	-	-
Bull Grant	0.13	-	-	-	-	-
Service Fees	0. 1	-	-	-	-	-
Attested Herd Bonus	1. 1	0. 6	0. 5	0. 6	0. 6	0. 5
Hill Cattle Subsidy	0.16	-	0. 5	-	0. 2	-
Calf Subsidy	2. 9	-	-	-	-	-
Total Credits	9.17	0. 6	0.10	0. 6	0. 8	0. 5
Total Net Costs	13. 3	12. 5	1.16	9. 9	3.12	11. 7
Average Number of Animals	444	443	412	221	161	6

STORE CATTLE SURVEY 1952-53.

SPRING BORN CALVES REARED BY SUCKLING METHOD.

COSTS PER ANIMAL. Number of Farms = 28.

Age Group.	Calves 0-6 months (Full Year Breeding Herd).	Calves 6-12 months.	Store Cattle: 12-18 months	18-24 months	24-30 months	30-36 months
Cost Items:-	£. s	£. s	£. s	£. s	£. s	£. s
Purchased Meals	0.10	0. 5	-	-	-	-
Home-grown concentrates	0. 3	1. 2	-	0. 2	-	-
Oat Sheaves	1. 7	1. 5	-	1. 2	-	1. 6
Hay and Silage	4. 1	2.16	-	3. 7	-	4. 6
Straw	1. 3	0. 1	-	0.14	-	0. 5
Roots and Green Fodder	0.16	1. 5	-	0.17	-	0. 4
Grazing	3.18	0. 1	1. 3	0.10	2. 2	0.14
Total Foods and Grazing	11.18	6.15	1. 3	6.12	2. 2	6.15
Labour	8. 5	3.13	0.16	3.11	0.17	4. 6
Sundry Costs	1. 0	0. 6	0. 7	0. 8	0.10	0.13
Loss on Casualties	-	0. 1	-	-	-	-
Depreciation of Breeding Herd	0.19	-	-	-	-	-
Purchases of Calves	0. 8	-	-	-	-	-
Total Costs	22.10	10.15	2. 6	10.11	3. 9	11.14
Credits:-						
Sales of Calves	1.18	-	-	-	-	-
Milk not for Calf Rearing	3.11	-	-	-	-	-
Bull Grant	0.15	-	-	-	-	-
Service Fees	0. 5	-	-	-	-	-
Attested Herd Bonus	2.12	0.14	0.15	0.15	0.15	0.17
Hill Cattle Subsidy	1.18	-	0.18	-	0.18	-
Calf Subsidy	4.16	-	-	-	-	-
Total Credits	15.15	0.14	1.13	0.15	1.13	0.17
Total Net Costs	6.15	10. 1	0.13	9.16	1.16	10.17
Average Number of Animals	503	489	440	257	173	20

STORE CATTLE SURVEY 1953-54.

SPRING BORN CALVES REARED BY SUCKLING METHOD.

COSTS PER ANIMAL.

Number of Farms = 27.

Age Group.	Calves 0-6 months (Full Year Breeding Herd).	Calves 6-12 months.	Store Cattle. 12-18 months.	18-24 months.	24-30 months.	30-36 months.
Cost Items:-	£. s	£. s	£. s	£. s	£. s	£. s
Purchased Meals	0. 9	0. 9	-	0. 3	-	0. 3
Home-grown concentrates	0.12	1. 4	-	0.18	-	1. 9
Oat Sheaves	0.17	1. 0	-	0.13	-	0.16
Hay and Silage	4. 8	3. 3	0. 1	3. 3	-	3.11
Straw	0.19	-	-	0.10	-	0. 9
Roots and Green Fodder	0.15	1. 4	-	0.12	-	0. 7
Grazing	4. 9	0. 2	1. 4	0.11	2. 3	0.17
Total Foods and Grazing	12. 9	7. 2	1. 5	6.10	2. 3	7.12
Labour	8.19	3.17	0.16	4. 0	0.16	5. 2
Sundry Costs	1. 5	0. 6	0.10	0.10	0.10	0.10
Loss on Casualties	-	0. 4	0. 6	0.10	-	-
Depreciation of Breeding Herd	2.12	-	-	-	-	-
Purchases of Calves	0.19	-	-	-	-	-
Total Costs	26. 4	11. 9	2.17	11.10	3. 9	13. 4
Credits:-						
Sales of Calves	1.16	-	-	-	-	-
Milk not for Calf Rearing	3. 7	-	-	-	-	-
Bull Grant	0.10	-	-	-	-	-
Service Fees	0. 5	-	-	-	-	-
Attested Herd Bonus	3. 5	0.19	0.17	0.19	0.18	0.17
Hill Cattle Subsidy	0. 5	-	0.19	-	1. 4	-
Hill Cow Subsidy	7.15	-	-	-	-	-
Calf Subsidy	4.15	-	-	-	-	-
Total Credits	21.18	0.19	1.16	0.19	2. 2	0.17
Total Net Costs	4. 6	10.10	1. 1	10.11	1. 7	12. 7
Average Number of Animals	498	492	406	244	171	26

APPENDIX D.

The following accounts are in the form laid down by the Informal Commodity Group on Store Cattle Costings. All figures are 'per cow' - i.e. the total figures have been divided by the average number of cows in the opening and closing valuation.

GROSS MARGIN PER COW 1951-52.

Stock Inputs.	£. s. d	£. s. d	Stock Outputs.	£. s. d	£. s. d
Opening Valuation:-			Sales:-		
Cows	32. 7. 3		Cows	5.18.10	
Bulls	3.15. 1		Bulls	2. 4. 4	
Other Cattle	37. 3. 2		Deaths	0. 4. 0	
			Calves 0-12 months	2. 5. 5	
Total		73. 5. 4	Other Cattle	29.19. 2	
			Subsidies & Credits	9.12. 2	
Purchases:-					
			Total		50. 3.11
Cows	0. 5. 1				
Bulls	1. 8. 8		Closing Valuation:-		
Calves	0.12. 1				
Other Cattle	2. 7.10		Cows	33. 5.10	
			Bulls	3.17. 4	
Total		4.13. 8	Calves 6-12 months	23.17. 9	
			Other Cattle	15. 6.10	
(a) Total Stock Inputs		77.19. 0	Total		76. 7. 9
(c) GROSS MARGIN (b-a)		48.12. 8	(b) Total Stock Outputs		126.11. 8

NET MARGIN PER COW.

Other Inputs.

		£. s. d	£. s. d
Labour	98 hours		13. 2. 5
Feed - Purchased Concentrates	0.3 cwt.	0.10. 9	
- " Other		-	
- Home-grown Concen.	2.5 "	1.11. 9	
- Home-grown Roots	24.9 "	2. 9. 0	
- Home-grown Oat Sheaves	7.9 "	2. 3. 3	
- Home-grown Hay	32.9 "	6.15.10	
- Home-grown Straw	10.9 "	1. 6. 0	
- Grazing		5. 7. 4	
Total Feed			20. 3.11
Rent (Specialised Buildings or Land)			0. 3. 6
Sundry Direct Costs (inc. Vet)			0.14. 1
Depreciation & Repairs (Specialised Equipment)			0. 3. 3
Transport and Marketing Expenses			0.13. 4
Total Other Inputs			35. 0. 6
NET MARGIN (Gross Margin - Total Other Inputs)			13.12. 2

GROSS MARGIN PER COW 1952-53.

Stock Inputs.	£. s. d	£. s. d	Stock Outputs.	£. s. d	£. s. d
Opening Valuation:-			Sales:-		
Cows	33. 3. 5		Cows	6. 9. 9	
Bulls	4. 0. 4		Bulls	3. 6. 2	
Other Cattle	38. 6.10		Deaths	0. 3. 7	
			Calves 0-12 months	2. 4. 2	
Total		75.10. 7	Other Cattle	28.16. 6	
			Subsidies & Credits	14.13. 3	
Purchases:-					
			Total		55.13. 5
Cows	0.18. 3				
Bulls	2. 0. 8		Closing Valuation:-		
Calves	1. 6. 3				
Other Cattle	0.16. 9		Cows	35. 3. 2	
			Bulls	4.11.11	
Total		5. 1.11	Calves 6-12 months	30. 5. 6	
			Other Cattle	20. 1. 4	
			Total		90. 1.11
(a) Total Stock Inputs		80.12. 6			
(c) GROSS MARGIN (b-a)		65. 2.10	(b) Total Stock Output		145.15. 4

NET MARGIN PER COW.

Other Inputs.

		£. s. d	£. s. d
Labour	92 hours		12.14.10
Feed - Purchased Concentrates	0.4 cwt.	0.14. 5	
- " Other		-	
- Home-grown Concentrates	1.8 "	1. 3. 7	
- Home-grown Roots	17.4 "	2. 1. 7	
- Home-grown Oat Sheaves	9.7 "	2.15. 0	
- Home-grown Hay	32.7 "	7. 9. 9	
- Home-grown Straw	11.3 "	1. 7. 2	
- Grazing		5. 2.11	
Total Feed			20.14. 5
Rent (Specialised Buildings or Land)			0. 3.11
Sundry Direct Costs (including Vet)			0.12. 5
Depreciation & Repairs (Specialised Equipment)			0. 4. 3
Transport and Marketing Charges			0.14. 0
Total Other Inputs			35. 3.10
NET MARGIN (Gross Margin - Total Other Inputs)			29.19. 0

GROSS MARGIN PER COW 1953-54.

Stock Inputs.	£. s. d	£. s. d	Stock Outputs.	£. s. d	£. s. d
Opening Valuation:-			Sales:-		
Cows	34. 8. 9				
Bulls	4. 9. 1		Cows	5. 9. 1	
Other Cattle	45. 7. 0		Bulls	3.11.11	
			Deaths	0. 2. 8	
Total		84. 4.10	Calves 0-12 months	4. 7. 9	
			Other Cattle	31. 2. 7	
Purchases:-			Subsidies & Credits	20. 6. 6	
Cows	1. 7.11		Total		65. 0. 6
Bulls	2. 9.11				
Calves	0.16. 5		Closing Valuation:-		
Other Cattle	2. 6. 9				
			Cows	36. 4. 5	
Total		7. 1. 0	Bulls	4.18. 7	
			Calves 6-12 months	29.15. 3	
			Other Cattle	22. 2. 7	
(a) Total Stock Inputs		91. 5.10	Total		93. 0.10
(b) GROSS MARGIN (b-a)		66.15. 6	(c) Total Stock Output		158. 1. 4

NET MARGIN PER COW.

Other Inputs.		£. s. d	£. s. d
Labour	92 hours		13.10. 1
Feed - Purchased Concentrates	0.4 cwt.	0.17. 6	
- " Other		-	
- Home-grown Concentrates	2.7 "	1.19. 4	
- Home-grown Roots	18.6 "	1.18. 2	
- Home-grown Sheaves	6.5 "	1.16. 4	
- Home-grown Hay	33.3 "	7.18. 3	
- Home-grown Straw	9.1 "	1. 1. 0	
- Grazing		5.11. 6	
Total Feed			21. 2. 1
Rents (Specialised Buildings or Land)			0. 3.11
Sundry Direct Costs (Including Vet)			0.14. 1
Depreciation & Repairs (Specialised Equipment)			0. 4. 3
Transport and Marketing Charges			0.18. 4
Total Other Inputs			36.12. 9
NET MARGIN (Gross Margin - Total Other Inputs)			30. 2. 9

APPENDIX E.

NOTES ON COSTING - METHODS USED.

Details were obtained, in twice yearly visits, of the number and estimated value of cattle on hand at the beginning, middle, and end of the survey year (1st May - 30th April). Information was obtained on purchases, sales, births and deaths of cattle; on the number of different categories of stock grazing on the farm; the man-hours spent looking after the animals; on the foods fed and on other expenses incurred on the cattle enterprise.

Labour. Practically all the labour was of the adult male category and was charged at the following hourly rates which are based on the current statutory minimum rates plus allowances for the employer's contribution to National Insurance and for some overtime work.

	1951-52.	1952-53.	1953-54.
	s. d	s. d	s. d
Summer	2. 6	2. 9	3. 0
Winter	2. 9	2. 9	3. 3

Home-grown foods were charged at the average cost of production for a fairly large sample of farms in the Principality:-

	1951-52.	1952-53.	1953-54.
	£. s. d	£. s. d	£. s. d
Oats (per cwt.)	0.12. 5	0.13. 4	0.13. 1
Mixed Corn (per cwt)	0.14. 3	0.14. 4	0.15. 1¾
Barley " "	0.13. 5	0.13. 5	-
Oat Sheaves:			
Grain " "	0.12. 3	0.12. 8	0.12. 8
Straw " "	0. 2. 1	0. 2. 2	0. 2. 2
Straw " "	0. 2. 4	0. 2. 5	0. 2. 3
Hay (per ton)	4. 6. 5	4.15. 0	4.18. 9
Grass Silage "	2. 6. 0	1.17.10	1.11. 4
Cereal Silage "	-	2.19. 8	-
Oats (Cut Green) "	-	10.10. 0	10.10. 0
Turnips & Swedes "	2. 3. 3	2. 3. 4	2. 2. 5
Mangolds "	1.13. 8	2.15. 5	1.19. 9
Kale (Cut & Fed) "	1.17. 4	2. 5. 1	-

Grazing costs were calculated in the following way. The number of labour and tractor hours spent on grassland cultivation were costed at the appropriate rates, and to this was added the cost (net of subsidy) of fertilizers and an allowance for rent calculated on an acreage basis. The cost of large items of a long term nature, such as drainage schemes, was spread over a number of years. Where no hay crop was taken the year's cost of grazing was divided between summer (May 1 - October 31) and winter (November 1 - April 30) in the proportion 2/3rds : 1/3rd. Where a hay crop was taken two-thirds of the total cost was allocated to hay, one-ninth to summer grazing and two-ninths to winter grazing. Having thus obtained the cost of grazing in summer and winter the cattle's share was calculated according to the number of grazing days attributable to each category of livestock, the different types of livestock being rendered comparable

by being expressed in 'cow units'. The numbers of livestock equal to one cow unit are given below:-

	Cow Units.
Cattle 2 - 3 years	1
" 1 - 2 "	2
Calves	4
Sheep	7

Valuations: Breeding Stock were valued at constant prices throughout the period but other cattle were valued at current market prices.
