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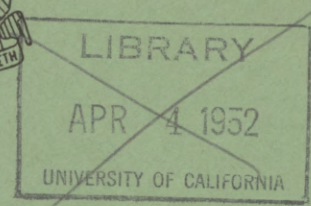
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STORE CATTLE SURVEY 1947-1950.

by

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AGRICULTURAL RESEARCH BUILDING, PENGLAIS, ABERYSTWYTH

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Aberystwyth

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*With the Compliments of
Professor E. F. Nash*

FOREWORD.

It is well known that the cattle industry in Wales has undergone far-reaching changes, especially since 1930. These changes have not only brought about a decline in the importance of the store cattle trade but have also affected the structure of the cattle enterprises and the breeds of cattle maintained. The outstanding feature, of course, has been the swing over to milk production which was due to the pressure of economic forces, notably rising costs and poor returns from rearing compared with the sale of liquid milk. At present about 60 per cent of the farmers in Wales are concerned with milk selling. In some areas store raising has given place almost entirely to the sale of milk; in others where farmers have changed over to the sale of milk they have also continued to rear some stores. In yet other parts of Wales, there has been no change in the traditional system of store-raising and butter making.

Any great expansion in the supply of store cattle can hardly be expected as long as milk provides a more remunerative source of income than the rearing of livestock. Results of investigations continue to show that store cattle production in general is not an attractive enterprise from the financial point of view and, despite its relative importance in the agricultural economy of this country, little inducement to practice it was given to farmers until very recently. Measures like the Hill Farming Act, the Marginal Production Scheme, the Calf Rearing and Hill Cattle Subsidy Schemes and the Livestock Rearing Act (1951) have been designed to assist producers on upland and marginal land, and the offers of subsidies and grants will no doubt provide an incentive to farmers on such land to increase the output of cattle. It does seem, however, that one of the most important considerations in attracting producers of store cattle and others to the production of beef-stores, and in turning them from other ways of farming to store-cattle raising, is the need for long-term safeguards in the way of price-guarantees. In the raising of store cattle, costs are incurred a long time before sales take place. Rearers whose herds are associated with milk production will hardly give up or restrict milk production in favour of store cattle raising in large numbers, without specific guarantees of future price levels for stores. If it is in the interests of Welsh farming as a whole that more store cattle be produced, then it is desirable to bring the returns from rearing more into line with those from the sale of milk. Recent data of financial results for farming types in Wales show that earnings continue to be lower on the stock-raising than on the milk-selling farms.

Financial Results for Identical Groups of Farms
in Wales. (1949 and 1950).

<u>Type-Group.</u>	<u>Per 100 Acres.</u>		<u>Farm Income. (a)</u>	
	<u>Rent per Acre.</u>	<u>1949.</u>		<u>1950.</u>
		s. d.	£.	£.
Stock-raising (poor land)	10.10	45	49	
Milk Selling (poor land)	11. 4	195	172	
Stock-raising (better land)	21. 9	238	256	
Dairy Farms	33.10	609	586	

(a) Farm Income is the balance of revenue over expenditure adjusted for the difference between opening and closing valuations of live and dead stock. It represents the remuneration for the labour and managerial activity of the farmer and wife and for interest on capital invested.

(b) The severe drop in farm income on the stock-raising farms in 1950 is the result of a drop in the price per head of cattle sold, reduction in subsidy rates and depreciation of capital.

Investigations into the costs of store cattle production in Wales were started by the Department of Agricultural Economics in 1942-3 and are still being continued. There were two main groups of farms in these investigations - those rearing calves by suckling (normally one calf per cow) and producing beef stores and those where calves were reared on the bucket and where stores were destined for both beef and dairy herds.

The report that follows covers the costing period 1946-7 to 1949-50 (inclusive). It appears from this report that considerable variation occurred in standards of management on different farms; that a substantial part of the total costs of rearing cattle to mature age is incurred in the first few months of their lives; and that the feeding and management of calves appears to call for urgent attention.

It is an established fact that successful store-raising is largely linked up with the breeding of good quality stores; but it must not be overlooked that no plan for livestock improvement can succeed without the proper feeding and management of calves, if they are to develop into healthy profitable stock. Under-nourishment and bad housing in the early stages often retard the normal development of many well-bred calves. Good breeding must go hand in hand with good rearing, with particular emphasis on a system of feeding which will meet fully the nutritional requirements of the growing animal. Lack of care of calves during the early part of their lives has a marked influence on their ultimate thrive, development and profitableness.

The Department of Agricultural Economics, University College of Wales, Aberystwyth, acknowledges with thanks the assistance given by those farmers whose records form the raw material of this report.

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Assistant Adviser in Agricultural
Economics.

January, 1952.

STORE CATTLE SURVEY 1947-50.

1. A Review of recent changes in livestock policy and the cattle situation in Wales.

There is a tendency to regard store cattle production as a separate sector of the agricultural industry and to refer to it as "the store cattle industry". While it is true to say that certain areas of farming land in the British Isles are particularly given over to this form of production, there has been a tendency in recent decades for it to become merely part of another farm enterprise; this is particularly the case on many Welsh upland farms which are now engaged in producing milk for the "liquid" market. The changeover to milk production has undoubtedly brought economic advantages which one would hesitate to deny to these formerly "depressed" areas. But the question is often asked whether many of these areas, or of the individual farms in them, would not be more appropriately engaged - in the national interest - in producing the raw material for the dairy and beef herds which are found on better land. In the production of beef animals there is, of course, a greater tendency to separate the two processes of rearing and finishing, and very often when reference is made to the "store cattle trade" it implies the trading of cattle for beef production only. A large number of small farms in Wales, however, engaged as they are in the production of milk, utilise dual purpose cattle, and therefore rear for both dairy and beef herd replacements. On the other hand, there are areas - particularly in the Border counties - which have a long tradition and reputation in rearing colour-marked store cattle for beef production.

Prospects for the store cattle industry - if it may be so described - are obviously tied up with those of beef and milk production. The remarkable development and achievements of the milk-producing sector of our agricultural industry are well known. They were influenced by marketing reorganisation before the war and by the trend of liquid milk prices relatively to those of other livestock prices since the reorganisation. The price mechanism is still being used in efforts to direct home agricultural production, and recent trends of current and forward prices indicate some change of emphasis. Even the subsidies being offered for calf rearing and for raising cattle on the hills are price-supports and, therefore, part of the price-mechanism incentive designed to induce greater production of meat from our farms.

The calf-rearing subsidy itself has been subjected to some criticism, particularly as it has entailed an exorbitant cost when this is measured against its effect in increasing the numbers of potential meat animals. Out of nearly 403,000 calves certified on Welsh farms up to June 1950, less than 30 per cent were steer calves. A large proportion of the subsidy, therefore, went to milk-producing farms as a subsidy on rearing their herd replacements. From October 1950, however, the subsidy applies to steer calves only, and is payable at £5 per head. Most of those now certified will, therefore, have to be suitable for further rearing for beef production (see Table 1, Appendix A).

As far as the Hill Cattle Subsidy Scheme is concerned, the tendency has been for figures to show an increase in number of cows, and a decrease in numbers of 'other cattle' qualifying for subsidy in Wales. This applies to most of the Welsh Counties (see Table 2, Appendix A). There has been a tendency in the England and Wales Hill Cattle Subsidy Scheme to adjust payments in favour of breeding cows and heifers (i.e. female cattle kept on the hills for the specified period while suckling calves). The 1951 scheme allows for a £5 per head subsidy on cows and heifers and £2.15.0 per head on other eligible cattle. This principle was adapted in the Scottish schemes from the early period of the subsidy, and there is reason to believe that they have been more successful than the comparable schemes in England and Wales. An increase in the breeding cow population on the hills is probably the best indication of progress in re-stocking hills with cattle.

According to the June census figures the number of steers on Welsh farms increased appreciably in recent years; this applies particularly to the age group of 1-2 years old. The 1951 figures would suggest that a slightly larger number of these were being kept beyond the 2-year-old stage. The following table shows relative figures for the period 1946 to 1951:-

Number of Steers on Welsh Farms (June figures).

Year.	: 2 years : & over.	: 1 to 2 : years.
1946	: 46,756	: 48,552
1947	: 44,764	: 49,760
1948	: 47,853	: 44,616
1949	: 46,262	: 55,870
1950	: 49,890	: 62,646
1951	: 52,100	: 61,300

The trend may tie up to some extent with that in number of calves slaughtered at Welsh collecting centres. Over 8,000 fewer calves were slaughtered at these centres in 1949 than in 1947 (see Table 3, Appendix A).

The number of store cattle over one year old in Wales relatively to the dairy cattle population (represented by cows and heifers in milk and in calf) fell appreciably after the outbreak of war. It had in fact been falling during the previous decade. There is a slight indication that this proportion is now on the increase. For the five-year period 1946-50 the average number of store cattle per hundred of dairy cattle in Wales was 65; for June 1951 the corresponding figure was 71. These averages compare with 79 and 76 for the five-year periods 1928-32 and 1935-39 respectively (see Table 4, Appendix A).

Recent statistics also indicate that there are about 40 per cent more registered milk producers in the Principality than there were immediately before the war, and that the total number now represents about 60 per cent of the total number of farmers (see Table 5, Appendix A). Changes in the agricultural price structure, and the enforcement of certain regulations relating to milk production, may cause some reversion in the future; i.e. some types of milk producer may go back to the production of store cattle or even to beef where conditions are favourable. This trend need not be accompanied by a reduction in the aggregate liquid milk supply; further progress in livestock improvement and management may provide an increased quantity of milk from fewer cows and fewer farms. A store cattle industry properly integrated with the other sectors - milk and beef production - might look forward to a more prosperous and stable future than seemed possible in its uncertain and depressed past. Success with fattening cattle depends more on the type of store animal used, and its price relative to quality and weight, than on any other factor. It is true, however, that the small size of farming enterprises in Wales has hindered progress in securing economic units for the store cattle enterprise in the Principality.

Future prospects may also depend on possibilities of marketing reorganisation. Discussions have already taken place between the Government and the farmers' organisations on the question of setting up a Livestock Marketing Board under the provisions of the Agricultural Marketing Act. To a large extent, the marketing of store cattle has, so far, been a haphazard affair, and the institution of a marketing scheme may help to integrate the whole cattle industry in such a way that each sector will get an appropriate share of the value of the total eventual product. With the preponderance of small farms in Wales there is no reason why co-operative schemes should not be adopted on a wider scale in this sector of our industry. Numbers of cattle kept have hitherto been tied too much to the possibilities of winter feed provision on hill and upland farms. "Summering" capacity is not, as a result, fully utilised. Co-operation with lowland farms seems to offer a good avenue to future prosperity for those engaged in this important branch of our livestock industry. Furthermore, with the advent of artificial insemination and other services, the product of the store cattle industry can be further improved.

No other factor can, however, be substituted for management in stimulating progress and improvement in any field of agriculture. The attraction of the liquid milk market may have caused some deterioration in methods of calf rearing on many of our rearing farms. "Well begun is half done" is certainly a truism where livestock are concerned, and considerable visual evidence has been

available in recent Cambridge experiments to demonstrate this fact. Science has been of considerable assistance to management; in no field has it been more important than in that of the health of stock. Calves are susceptible to innumerable ailments, and routine management can do a great deal to prevent many of them. Again, on many farms accommodation for calves is far from desirable, and not conducive to health.

Variations in management and policy result in considerable variation in the product of the store cattle industry. When prices are quoted for store cattle, even of separate age-groups, the average may represent a composite made up of several different types. The trend in the prices of the composite may not represent that of any particular part of it; prices of good, strong, colour-marked stores may move differently from those of poorer quality non-descriptors. It would be reasonable, however, to expect prices of store cattle to follow the trends of prices of beef and milk. Beef producers have, in the last few years, generally experienced difficulty in obtaining a sufficient supply of well-reared and fully developed stores. Feeders are therefore often compelled to seek their stores at long distances and it is unfortunate that, in some areas of Wales, the quality of the product of rearing farms does not match the feeding capacity of adjacent lowland areas; under such circumstances prices of local stores may not move equally with those of beef or milk. Controlled prices for beef have recently increased at a slightly faster pace than those for milk, and guaranteed prices for future years indicate a still greater stress on the meat products of our livestock industry. Recent fixed prices for beef and milk are as follows:-

Average Controlled Prices (together with indices).

Period for which prices are fixed.	Fat Cattle (Steers, Heifers & Cow Heifers).		Milk*	
	Price per cwt.	Index.	Price per gallon.	Index.
1947-48 fixed at February 1947 Review	s. d. 83.11	100	d. 27.4	100
1947-48 adjusted at August 1947	90. 9	108	28.5	105
1947-48 & 1948-49 adjusted for incentive at Special Review, August 1947	98. 3	117	30.0	110
1949-50 fixed at February 1949 Review	102. 9	122	32.25	118
1950-51 fixed at February 1950 Review	104. 9	125	33.125	121
1951-52 fixed at February 1951** Review	115. 0	137	35.0	128

* Excluding Temporary Bonuses. ** The increase of 10s. 3d does not apply to the C grades.

Owing to differences in the structure of their relative costs, it would be reasonable to expect costs for milk to have increased relatively more than those for beef; at the same time, however, the index of average price of beef - as the above table shows, has been increasing relatively more than that of milk.

The Ministry of Agriculture's monthly quotations of store cattle price indices appear to indicate a small decline in 1950 compared with 1949, although they were still well above the 1948 level. The indices show a relatively sharper rise in the summer and autumn months than in winter and early spring (Table 6, Appendix A).

Recent data of financial results on Northern Ireland farms - an area of small family farms - show a tendency to a decline in the profitability of cattle enterprises compared with others. The last few years have brought varying fortunes to the different farming systems of that country, but no sector of its agricultural industry appears to have suffered as much as that of cattle feeding. Pig and poultry holdings have maintained a comparatively high degree of profitability per acre. Changes in relative profitability are shown in Table 7, Appendix A. The average size of the farms covered in the survey was between 60

and 70 acres. Similar trends might be expected on Welsh farms which are comparable in size and also in the source of labour, the latter being of course derived from the farm family. Pigs and poultry might usefully be incorporated in many stock-raising organisations in Wales. Where accommodation and foods can be provided these enterprises could utilise available labour with advantage and contribute to the well-being of the family farm.

2. A Summary of recent results with the Store Cattle Cost Investigation in Wales.

This investigation has been undertaken over a series of years on two groups of farms. One group, localised in the border area of Radnor and Brecon, consists of farms where the normal method of rearing is that of suckling one calf per cow. The other group, distributed through various counties, is one where calves are normally reared by bucket-feeding in the early stages, and where suckling is rarely practised, except for the first week or two of the calf's life in some few cases. Results for the year 1946-7 were published in a previous report, and some of them are repeated here for purposes of comparison with those of subsequent years.*

The same principles and costings method have been adopted throughout the whole period of this survey, and were explained in the previous report. Cattle and calves are grouped into convenient age groups and costed as "age bunches". 'Bunches' may be added to, and casualties have occurred in most of them; these are accounted for in the average costs. Where an animal is added to a group during the costing period (i.e. within the half-year), the cost for the whole period is reckoned proportionately: e.g. if an animal is in a group for, say, 10 weeks, the cost of raising for the half-year period is taken as 26/10ths of that incurred in the 10 weeks. Tables relating to this section appear in Appendix B at the end of this report.

(a) Calves up to 6 months old.

(i) Suckling Group. These calves are regarded as the main product of the breeding herds on the farms surveyed, and total costs incurred with these herds - after small adjustments for other credits, e.g. milk drawn and used for purposes other than calf rearing - are taken to represent the costs of producing the calves to weaning stage, or approximately six months of age. Table 1, Appendix B shows the average cost per calf on the farms in the sample for each of the four years covered. The variation between the different years has been due more to changes in the figure for herd depreciation than to any other single item of costs. The sample has not been identical throughout the period and this factor, of course, partly accounts for some differences; this would be particularly the case where farms can differ appreciably in their methods of feeding and in feeds used. In the original sample, that of 1946-7, much greater use was made of oats-on-the-straw as a feed for cows.

Transactions with calves (purchases and sales) are brought into the cost structure because purchases (for replacements, generally) are expenses incurred in rearing, and sales (of excess calves) constitute a product of the expenditure already taken into account. All calves would be suckling their dams while out on pasture during the summer.

There was a wide range in the 'cost per calf' between the individual farms in the various years, and it would be difficult to name any one factor which might be regarded as predominant in its influence. In the costing method adopted, prices realised for breeding cows and bulls disposed of have been an important factor in some cases; a low depreciation cost may be incurred if cows are sold, say, after rearing their second calf, and if the realisation price is much in excess of the normal valuation figure adopted at the beginning of the costing year.

In spite of a possible decrease in quantity of hand-fed foods required, the cost of feeding since 1947-48 has been increasing (see Table 1, Appendix B).

* B. H. Roberts. Store Cattle Raising in Wales: A Survey of Conditions and Production Costs. Department of Agricultural Economics, University College of Wales, 1948.

Most of the work would be executed by family labour, and this is charged for at the average regulation rates applicable. It is not surprising to find that the total cost of rearing a calf increased by £3 between 1946-47 and 1949-50. The weaned calf - costing about 16 guineas to rear - is not normally a marketable product on these farms, so that it is difficult to measure this figure against a possible market value. The beef store rearer, however, is concerned about ultimate cost at the marketable stage of the animal's life; and, while he may incur relatively heavy costs in producing a well-reared weaned calf, he may be able subsequently to raise it at a reasonably low cost and, hence, to obtain a fair profit margin at the selling-out stage.

(ii) Pail-feeding Group. Pail-fed calves have been grouped according to season of birth. This factor would have a bearing on the costs, particularly as those born in the autumn would be fed on winter-produced milk, while those born in spring would be reared on milk produced during the summer. The seasonal supply of calves would of course depend on whether or not individual farm policy were inclined towards winter milk production, in order to take advantage of the higher liquid milk prices then in force.

In the later years of this survey there appeared to be a tendency towards providing spring-born calves with an increasing quantity of milk. This would offset the economy arising out of the lower production cost per gallon of summer milk. Nevertheless, over the four years of the investigation, autumn-born calves have cost more to raise than spring-born ones. But seasonal and inter-farm variations give some unexpected results, as happened with the sample of farms in the 1949-50 investigation. Here it was found that large quantities of whole milk were fed, and excess labour was involved, for the spring-born calves.

The spring-born calves may be able to have a short time out at grazing during their first six months, particularly if they were born in early spring. This would enable rearers to economise on their feeding, but considerable care has to be exercised when young calves are put out to grass. It is, for example, dangerous to allow them access to pasture while the dew is still on the grass.

A large proportion of the calves in this group would be reared as dairy herd replacements. In some cases very strict economy was exercised in the feeding of whole milk, particularly where autumn-born calves were reared. More hand-feeding would be involved with autumn-born calves than with spring-born ones, and this fact also would be expected to enhance the "expensiveness" of winter rearing. Many of the spring-born calves would be able to supplement their diets with a little grazing, prior to being taken indoors for the winter period.

Details of costs of raising these calves appear in Tables 2 and 3 of Appendix B.

(b) Calves from 6 to 12 months old.

Details of costs for this age group appear in Tables 4, 5 and 6 (Appendix B). Sample changes and seasonal factors have been responsible for some rather unexpected results in the trend over the four years of the investigation. These are particularly evident in the average figures for autumn-born calves, and arise mainly from economy in feeding. Autumn-born calves, raising from 6 to 12 months old would be reared over the summer season, and could therefore take advantage of available grazing. Spring-born calves, on the other hand, would be reared over the winter, and would therefore be hand-fed almost entirely. There are, however, some striking differences within the groups which cannot easily be explained. In the case of spring-born 'bunches' of the 'pail-feeding' group the labour cost per calf is much higher than that for spring-born 'bunches' in the 'suckling' group, particularly during the last year of the investigation. This may be attributable to the larger number of young cattle handled in the 'suckling' group - a factor which would make for economy of labour. In the case of the 1949-50 samples there is very little difference in the average total cost per animal as between the 'suckling' and the 'pail-feeding' groups, although there were marked differences in their respective methods of feeding. Some nutritionists are of the opinion that if

an animal is started well (it might be for the first six months of its life) considerable economy can be effected in subsequent feeding. We should, therefore, expect 'suckled' calves to be less well fed after the first six months than 'pail-fed' ones. The data from the investigation, however, suggest that the 'suckled' calves were even more liberally fed in the immediate post-weaning stage than were the 'pail-fed' ones.

(c) Cattle 12-18 months old.

Where yearling cattle are kept on pasture, one would expect little change in costs of rearing over the period of years covered. Spring-born cattle generally spend the greater part of this stage of their life on pasture and, as Tables 7 and 8 (Appendix B) will show, average costs per animal do not reveal marked increases in the aggregate. The effect of size of 'bunches' becomes apparent in the labour costs for this age-group, where it will be found that the cost for the 'suckling' group is appreciably less than for the 'pail-feeding' group, in terms of per animal.

In Table 8 (Appendix B) costs of rearing autumn-born yearlings are shown. In this age-period these cattle would largely be fed indoors. Hay was the most important constituent of their diet, although some farms fed quite heavily with oats-on-the-straw. On the whole the 'bunches' were slightly larger than in the case of the corresponding spring-born group.

Losses or casualties were somewhat heavier in the case of spring-born animals of the 'pail-feeding' group than in either of the others. Digestive trouble and poisoning were given as the main causes of the losses.

(d) Cattle 18-24 months old.

Many of the cattle on the farms in this survey were sold within this age-group. There was a heavy draft from the 'suckling' herds, in particular, at about 18 months old.

Tables 10, 11 and 12 (Appendix B) call for little comment. The small size of the 'bunches' of spring-born 'pail-fed' cattle would, to some extent, account for the high costs of labour per animal in the last two years of the investigation. Cattle of this age appear to have cost more to keep on the 'pail-feeding' farms than on the 'suckling' farms; feeding costs were higher, and there is some evidence that cattle on the 'suckling' farms were kept out longer at grazing.

(e) Cattle 24-30 months old.

Two groups in this age-range were costed - one on the 'suckling' group of farms and the other of 'autumn-born cattle' on the 'pail-feeding' group. Cattle reared to this stage on the 'suckling' farms would be ready for sale either to yard-fatteners or to those buying forward stores for over-wintering, prior to fattening on pasture the following summer. Cattle from the 'pail-feeding' farms, on the other hand, would largely be in-calf heifers, or bullocks ready for 'finishing' on summer grass. The average costs respectively for these groups are shown in Tables 13 and 14 (Appendix B). There appear to have been marked increases in costs since the initial year of the investigation. As with the other age-groups, seasonal and sampling variations have influenced the trend to some extent.

(f) Total (aggregate) costs of production of 'mature' store cattle.

No attempt has been made in the course of this investigation to follow any particular 'bunches' of animals throughout the various age-ranges. To add up the average costs for different age-groups may therefore have some disadvantages as a means of presenting total costs, but the results may nevertheless be of interest. In Tables 15 and 16 (Appendix B) average costs for each succeeding half-yearly period are aggregated to the 2-year-old or 2½-year-old stage.

The figures in these tables show some unexpected trends, and here again the sampling and seasonal factors are suggested as exercising some

influence. As far as the 'pail-feeding' group is concerned, the autumn-born two-year-old cattle appear to have cost less than the spring born ones. This, of course, would be expected as a result of the fact that autumn-born cattle spend two summer periods out at grazing, while spring-born cattle spend the greater part of three seasons indoors in the first two years of their lives. Total costs to $2\frac{1}{2}$ years old are shown for some autumn-born cattle in the 'pail-feeding' group and for some cattle in the 'suckling' group. There is little difference in the figures for these groups. It must, however, be borne in mind that there is a tendency to allow ^{store} cattle over 2 years old a longer period of outwintering than is the case with younger animals.

Some of the " $2\frac{1}{2}$ -year-old" cattle in the 'pail-feeding' group would become in-calf heifers destined for milk production, so that the aggregate total costs give some indication of the cost of producing dairy herd replacements on these farms.

Cattle of $2\frac{1}{2}$ years old in the 'suckling' group may weigh up to $8\frac{1}{2}$ cwt. each alive. If we take 8 cwt. as an average the cost per hundredweight would be, roughly, 80s. Fatteners have recently been paying something like 110s. per live hundredweight for beef stores and considerably more for well-reared colour-marked cattle.

3. Feeding of Store Cattle and Calves.

Reference has already been made to the influence of seasonal factors on production costs. Data relating to feed consumption in the survey show considerable changes from year to year. The rather 'open' weather of recent winters made it possible to extend the grazing season on a number of farms, and this led to some economy in winter feeding. There was also considerable variation from farm to farm in the type of feed used and in the relative quantities consumed. Changes in the sample would, therefore, account for some of the differences in the feed consumption as between different years. Tables relating to the feeding of cattle and calves appear in Appendix C.

(a) Calves up to 6 months old.

When calves are fed 'on the bucket', whole milk constitutes an important component of the rearing cost. In the tables given in Appendix B, the milk consumed has been charged at an average cost of production determined from an independent investigation. If the alternative use value (i.e. for liquid milk sold) was applied, the cost would, of course, be appreciably more. There is a tendency for spring-born calves to be allowed much more milk (whole and skimmed) than autumn-born ones. The average consumption for the four years of the investigation was as follows:-

	<u>Spring-born calves.</u>	<u>Autumn-born calves.</u>
	<u>(Up to 6 months old)</u>	
Whole milk (gallons)	74	50
Skim milk (gallons)	48	26

The suckling herds covered in the investigation were exclusively of the Hereford breed, and calves produced were practically the entire product each year. No data were available to indicate the approximate milk-yielding capacity of the cows, but it will be obvious that the suckling calves would consume considerably more of this food than would the pail-fed calves. Most of the herds were 'ranch'd' on the traditional methods, and the cost of producing whatever milk was available for the calves would be relatively low. Moreover, these calves would require little else during the first six months of their lives, and would generally get accustomed to grazing at a comparatively early age. Average feed consumption of the breeding herds (together with calves at foot) is not given in Appendix C mainly because it could only be expressed in terms of "per calf reared" - which might cause confusion in interpretation.

(b) Calves 6-12 months old.

Spring-born calves in both groups would spend much of this part of their lives indoors and their requirements in supplementary foods would be considerably more than those of autumn-born calves. Average figures are shown in Tables 2 and 3 (Appendix C). Feeding of autumn-born calves was largely confined to bought concentrates, and over the four years the average consumption per head was 48 lb. Spring-born calves of this age on the 'pail-feeding' farms consumed, on average, nearly 11 cwt. of hay per head, besides concentrates, with a little bulk in the form of straw and roots; those on 'suckling' farms were given rather more hay, and oat sheaves featured more prominently in their ration. The age of weaning on the 'suckling' farms varied, and this factor would have some effect on the relative amounts of feed consumed by the calves during their first winter. The constitution of the diet also varied considerably as between individual farms, and the average diet shown in Table 3 (Appendix C) could not strictly be regarded as typical for the group as a whole.

(c) Cattle over 1 year old.

With similar qualifications to those mentioned above regarding interpretation of average diets and changes in samples, figures of average feed consumption for older cattle appear in Tables 4, 5 and 6 (Appendix C). Only feeding for the winter periods is shown in these tables. A few cattle were given supplementary feeds during the summer grazing season, but in terms of total cattle costed the amounts would be small and meaningless. The figures illustrate the reliance on hay and straw. The decrease in quantities of oat sheaves (oats-on-the-straw) fed might be due to several factors, although there is reason to believe that a reduced acreage of the crop in later years was largely responsible for it on some farms.

(d) Discussion of results and conclusions.

The results of this investigation suffer, as most of those of enterprise cost studies do, from the fact that the analysis and examination are made on data relating to a single enterprise in isolation. But with uniformity in interpretation of costs, and in costing technique, from year to year, and between each farm, comparative evidence of trends and of the influences of various factors becomes valuable.

What the investigation has revealed is a considerable variation in standards of management on different farms. Feeding and management of calves appears to be a problem calling for urgent attention. Once the difficulties of the early period of a calf's life are overcome, problems attending management at a later stage are simplified. It will be obvious from the data provided in the tables that a substantial part of the total cost of rearing cattle to mature age is incurred in the first few months of their lives. The success of the store raising enterprise as a whole will depend very largely on the degree of success obtained in rearing young calves; foundations for successful rearing are laid in the first few months, if not the first few weeks.

No instance was encountered, in the course of the investigation, of cases where calves were reared on the "multiple suckling" system. This system involves the use of nurse cows, rearing up to eight or more calves by restricted suckling, and has been successfully used where suitable nurse cows and accommodation are available. It is undoubtedly a method which can make a remarkable contribution to the store stock supply; even if only three or four calves are reared per cow, it affords a rapid means of increasing the supply of stores of good constitution. Additional labour is, of course, involved, as compared with the 'ranching' method of single-calf suckling of dams on pasture; and it is good policy to feed the 'nurse' cows on a liberal scale, because they will not under such circumstances have lost condition when they finish rearing and are graded as fat cows. Although the scope for this form of calf rearing is limited, it is one which needs to be demonstrated on a larger scale and put to the 'economic' test more thoroughly.

Reference has already been made to the experiment undertaken in Cambridge, where remarkable results have been obtained in raising cattle at

various levels of feeding. Details of this experiment have been published,* but it may be of interest and value to reproduce some of them here. The cattle were subjected to four feeding methods, which are outlined below.

Group 1. Calves up to 8 months given a moderate diet, embodying 40 gallons of whole milk (fed in pail) during the first 9 weeks; concentrates and hay were offered to them from 1 month old. From the age of 8 months the winter diet (over 3 winter periods) consisted of hay (medium quality), straw and sugar-beet pulp, and a little concentrates.

Group 2. Calves up to 8 months old fed as in Group 1; from that stage they were fed, during the winter feeding period, on a higher plane than those of Group 1, substituting good quality hay for medium quality, and fed more liberally with calf and cattle nuts and with the bulky foods. These cattle were not carried over the third winters.

Group 3. Calves reared on nurse cows for 6 months, on the multiple suckling system, to allow each calf about 1 gallon of milk per day. Concentrates were fed "ad lib" from the time the calves started eating solid food (the maximum offered being 6 lb. per day). Hay was also offered to them, up to a maximum of 7 lb. per day. From the calf stage the cattle were offered a diet similar to the corresponding ones in Group 1.

Group 4. Calves reared as in Group 3 and older cattle fed as the corresponding ones in Group 2, i.e. fed on a high plane throughout their life.

In the chart at the end of this report the costs incurred at the different stages of development of the animals in this experiment are shown in diagrammatic form. This reveals the extent of the differences in costs incurred at the respective stages and how far they have influenced the final result. In short, the results are as follows: where economy in feeding was instituted at each stage - both calves and cattle being fed moderately (Group 1 above) - this method produced a slower rate of growth to maturity, but gave the highest feeder's profit per animal, although not the highest profit per year of animal's life; where calves were fed initially on a high plane, and moderately thereafter (Group 3 above), the feeder's profit was not much less than that of Group 1, while there was a bigger profit per year of animal's life; the method adopted in Group 2 produced a small profit, but considerably less per year of animal's life than that in either Group 3 or Group 1; while that in Group 4 just managed to balance costs and returns. This result indicates the economic advantages and disadvantages of each policy, and particularly shows what can be gained by starting the calf well and giving it, its requirements of whole milk by the natural method of suckling. Not only does this produce stamina in the calf, but it also reduces the period necessary to achieve mature growth, thus producing a better quality product in a comparatively short time.

These results are borne out to some extent in the survey undertaken on the Welsh farms. Although costs incurred in producing suckled calves were not much more than those of raising calves to the same age by artificial feeding, the product in the former case was considerably better in constitution. This of course is particularly an important factor in the production of beef animals. But authorities like Brookes believe that the same principles apply to the rearing of all classes of stock, and imply that no gain is eventually made by restricting any type of young stock to a moderate diet at the initial stage. The cost must not be looked at as a guide in itself; it must be examined in relation to the results obtained from its expenditure.

* A. J. Brookes. Beef Production Experiment at Cambridge. Journal of the Royal Agricultural Society of England, Vol. 111, 1950.

4. The Livestock Rearing Act, 1951.

This Act, which came into force in March 1951, may almost be described as another 'agricultural charter', particularly designed to assist producers on upland and marginal land. Its purpose is to encourage greater production of store cattle and store sheep by extending the areas - hitherto scheduled in the Hill Farming Act of 1946 - eligible for land improvement grants. The Act also makes provision for extension of the Hill Sheep and Cattle Subsidy Schemes for a further period of five years.

The provisions of the Act make it clear that the grants available are not primarily intended to support dairy farming, or the production of fat stock or cash crops, although a moderate proportion of such products in the total farm output will not be regarded as a disqualification. The Act will bring within its compass areas of land in Wales which adjoin hill farming areas, and such as were not previously considered to be within the scope of the Hill Farming Act. There is no doubt that farms included in these newly scheduled areas - very often representing uneconomic units in size and quality - have suffered in the past largely because they have not qualified on geographical grounds for assistance under the Hill Farming Schemes or Marginal Land Grant Schemes, and also through not being in a position to benefit from the advantages of economic milk production. The Act will also facilitate improvement to land attached to other farming units - both hill and lowland farms - but not hitherto considered eligible for grants, provided that the schemes submitted are regarded as comprehensive. One of the urgent requirements of hill farms is greater capacity in inbye and lowland to equate the seasonal stock-carrying capacity of the whole farming unit. Too often the hills are understocked in summer because the facilities for winter keep are inadequate. Moreover, any scheme to encourage a better balance of sheep and cattle populations on hill pastures will itself bring about an improvement in the pasturage, and thus help to sustain production. One of the possible dangers of the Act however, is that it might encourage - unless reservations were made in the schemes submitted - too great an expansion of sheep production at the expense of store cattle production, and thus aggravate the lack of balance as between cattle and sheep on upland pastures.

If lowland areas develop an increasing capacity, by grassland improvement and conservation, for carrying production stock, they will provide an expanding outlet for the product of upland and hill areas. Such scope must be available if the latter are to increase their own capacities.

The declared object of the Act is to encourage greater production of stores for the beef and sheep fattening industries. It may reasonably be asked, however, whether such schemes of improvement as are envisaged could be incorporated with others, like the Attested Herd Scheme, in order to encourage the production of good healthy replacements for dairy herds. It is surprising that more suitable agistment schemes have not already been adopted, such as those which have been locally attempted with a view to providing accommodation for dairy heifers on upland farms; they would help to release productive lowland for actual milk production.

It is perhaps doubtful whether we can yet afford to allow the thousands of upland farms, which have made such a vast contribution to our liquid milk supply, to go out of this form of production, and to devote their resources entirely to store stock raising. A balance between milk and store stock production on many upland farms can still be maintained and be consistent with the objects, and in accordance with the provisions, of the Livestock Rearing Act; this would give the farmers concerned the advantages of the quick turnover which is characteristic of milk production, and which has been of inestimable value to them in the last decade or so. The balance must be found before both the rearing and the milk-producing sectors of the industry can be satisfied. It is clear, from an economic standpoint, that any special advantages offered to milk producers should not encourage an 'artificial' concentration of resources on this type of production on farms which are unsuitable for it; on the other hand, financial support or subsidies for those engaged in rearing cattle should not prejudice the full utilisation of resources which can be economically utilised to produce all the milk necessary to satisfy the nation's requirements.

APPENDIX A.

Table 1.

Calf Subsidy: Number of calves certified.
Position as at 30 June, 1950.

County.	:		:		<u>Rates of Subsidy per head.</u>			
	Steers.	Heifers.	Period.	Steers.	Heifers.	£.	£.	
Anglesey	10,745	15,892	August 1947 to					
Brecon	9,428	15,284	October 1949	4	3			
Caernarvon	3,725	7,826	October 1949 to					
Cardigan	7,159	24,867	October 1950	5	2			
Carmarthen	2,514	44,902						
Denbigh	13,125	35,550	From October 1950:	5	nil			
Flint	2,410	20,608						
Glamorgan	(a)	(a)						
Merioneth	5,351	6,132						
Monmouth	10,351	22,873						
Montgomery	17,732	33,891						
Pembroke	11,956	27,489						
Radnor	10,602	12,485						
Wales								
(excl. Glamorgan)	105,098	268,399						

(a) Glamorgan. 29,413 calves were certified but the division of this total into Steers and Heifers is not available.

Source: Ministry of Agriculture & Fisheries, Welsh Department.

Table 2.

Hill Cattle Subsidy Scheme. Position at 30 June, 1950.

County.	:									:								
	Number ^{of} Paid Applications.			No. of eligible cattle in paid applications.														
	1947.	1948.	1949.	Cows.			Other Cattle.			1947.	1948.	1949.						
Brecon	665	647	645	1,425	1,819	2,249	6,231	5,933	5,812									
Caernarvon	536	542	544	238	440	409	6,645	6,394	6,548									
Cardigan	371	357	346	125	320	435	3,473	3,228	3,086									
Carmarthen	702	659	626	242	335	425	5,357	4,791	4,916									
Denbigh	410	400	396	157	201	219	4,514	4,327	4,577									
Flint	46	43	38	19	5	10	398	400	412									
Glamorgan	574	542	512	406	580	740	5,515	4,843	4,370									
Merioneth	1,019	1,031	1,008	1,476	1,545	1,461	11,228	11,540	11,624									
Monmouth	242	234	224	236	300	361	1,635	1,474	1,461									
Montgomery	874	863	888	650	858	1,168	12,244	12,236	12,254									
Pembroke	161	154	158	122	123	164	1,401	1,299	1,564									
Radnor	477	496	471	1,410	1,680	2,044	4,571	4,777	4,138									
Wales (inc. Monmouth)	6,077	5,968	5,856	6,506	8,206	9,685	63,212	61,245	60,762									

Source: Ministry of Agriculture and Fisheries, Welsh Department.

Table 3.

Numbers passing through Welsh Collecting Centres.
(Actual numbers purchased.)

County (in which centres are located.)	Cattle.			Calves.		
	1947.	1948.	1949.	1947.	1948.	1949.
Anglesey	11,761	12,246	11,667	4,712	4,676	4,837
Brecon	2,159	1,828	1,571	3,314	2,582	2,877
Caernarvon	6,160	5,711	5,313	7,379	7,302	6,917
Carmarthen	9,738	9,061	9,391	43,485	42,309	42,433
Cardigan	3,832	3,060	3,159	16,142	15,159	15,212
Denbigh	10,467	14,048	12,539	16,469	16,174	15,977
Flint	12,941	12,750	13,739	6,785	6,904	6,682
Glamorgan	10,843	11,448	10,850	14,779	13,968	12,932
Merioneth	3,346	3,247	3,317	3,285	2,464	2,699
Monmouth	8,638	8,005	7,491	11,513	13,236	11,110
Montgomery	4,908	4,549	4,670	6,196	5,558	5,886
Pembroke	9,577	8,553	9,105	16,372	15,400	14,770
Radnor	845	680	646	430	284	355
Wales (incl. Monmouth)	95,215	95,186	93,458	150,861	146,016	142,687

Source: Ministry of Food.

Table 4.

Numbers of "Other Cattle" over 1 year old per 100 of Dairy Cattle. Average of 5 year periods.
(June figures).

County.	:1928-32.	:1935-39.	:1946-50.	June 1950.	June 1951.*
Anglesey	133	151	124	123	133
Brecon	73	72	76	80	80
Caernarvon	63	66	60	70	76
Cardigan	82	74	49	52	51
Carmarthen	53	47	39	41	42
Denbigh	80	79	59	63	66
Flint	49	47	41	45	51
Glamorgan	59	59	56	60	70
Merioneth	97	103	113	120	127
Monmouth	83	84	71	80	82
Montgomery	113	105	94	95	97
Pembroke	95	87	60	63	62
Radnor	113	121	129	130	136
Wales (inc. Monmouth)	79	76	65	68	71

* Provisional.

Table 5.

Changes in Numbers of Registered Milk Producers in
Wales. December 1938 = 100.*

County.	Dec. 1938.	Sept. 1947.	Sept. 1948.	June 1950.	Producers at June 1950 as % of Total Agricultural Hold- ings over 5 acres (June 1949 census.)
Anglesey	100	163	174	186	37
Brecon	100	128	133	135	33
Caernarvon	100	158	165	163	56
Cardigan	100	166	169	169	72
Carmarthen	100	136	139	137	79
Denbigh	100	194	201	205	70
Flint	100	100	100	99	71
Glamorgan	100	100	100	97	64
Merioneth	100	164	165	152	51
Monmouth	100	115	116	109	47
Montgomery	100	138	148	151	38
Pembroke	100	144	146	142	74
Radnor	100	126	131	127	13
Wales (inc. Monmouth)	100	138	142	140	59

* Derived from figures in Digest of Welsh Statistics, Welsh Department,
Ministry of Agriculture and Fisheries.

Table 6.

Indices of Store Cattle Prices. 1938 = 100 for each
month.

Month.	1938.	1945.	1948.	1949.	1950.
January	100	145	193	216	219
February	100	133	187	210	211
March	100	142	195	212	208
April	100	146	188	214	208
May	100	166	213	245	230
June	100	160	215	255	227
July	100	167	223	250	253
August	100	170	229	255	n.a.
September	100	163	224	233	n.a.
October	100	160	217	230	n.a.
November	100	168	231	243	n.a.
December	100	172	238	240	n.a.

n.a. denotes series discontinued.

Source: Ministry of Agriculture and Fisheries.

Table 7.

Financial Results on Northern Ireland Farms.*

(a) Average Profits per acre for different groups.

Year.	Group.					
	1.	2.	3.	4.	5.	6.
	Mainly Sale Crops.	Mixed Sale Crops and Livestock.	Mixed Livestock.	Mainly Cattle Feeding.	Mainly Dairying.	Mainly Pigs and Poultry.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
1945-46	5. 9. 9	5.13. 5	3.10. 8	2.10. 5	3.19. 1	4.18.11
1946-47	9.12. 2	9. 7. 1	6. 2.10	3. 6. 7	7. 4. 7	8. 1. 6
1947-48	9. 1. 1	9. 2. 1	6. 5. 2	5. 8.11	6. 1. 5	9.15. 7
1948-49	10. 1. 8	8. 7. 5	7.11. 4	5. 3. 4	8. 4. 4	12.19. 3
1949-50	6.15. 8	8. 4. 7	6.13. 9	3.15. 1	8. 9. 5	9.16. 1

(b) Indices of Average Profits per acre.
Base (100) = Average of all groups in 1945-46.

Year.	Group.					
	1.	2.	3.	4.	5.	6.
1945-46	126	130	81	58	91	114
1946-47	221	215	141	76	167	185
1947-48	203	209	144	125	140	225
1948-49	232	192	174	119	188	298
1949-50	156	189	154	86	195	225

* These figures are derived from the Monthly Report of the Northern Ireland Ministry of Agriculture, August 1951.

APPENDIX B.

Tables 1, 2 and 3.

Costs of Raising Calves up to 6 months of age -
Average per Calf Reared.

Table 1.

Suckling Method.

Year of Investigation	1946-47.	1947-48.	1948-49.	1949-50.
Number of Farms	30	25	24	21
Total No. of Calves Costed	546	442	450	432
Food & Grazing Costs:-	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Purchased Concentrates	0. 1. 4	0. 2. 0	0. 3. 8	0.10. 8
Home-grown "	0. 4.11	0. 4. 0	0. 8. 9	0. 6. 0
Oats-on-the-straw	1. 7. 5	0. 7. 8	0. 9. 7	0. 6. 6
Hay	1.13. 0	1.17. 6	2. 1. 5	2. 9. 6
Straw	1. 6.11	1. 7. 8	1. 6. 2	1. 9. 7
Roots	0.12. 9	0.12. 2	0.14. 7	0.15. 4
Grazing	3. 9.11	4. 0. 3	3. 8.11	3. 5. 7
Total Foods and Grazing	8.16. 3	8.11. 3	8.13. 1	9. 3. 2
Direct Labour	5. 4. 1	5.18. 8	5. 4. 4	6. 0. 1
Depreciation of Breeding Herd	2.11. 4	1. 6. 6	0.16. 8	3.13.10
Calf Purchases	0. 3.10	0. 3. 7	0.17. 9	0.12. 5
Miscellaneous Costs	0. 5. 5	0. 6.11	0. 8. 1	0.10. 6
Total Gross Costs	17. 0.11	16. 6.11	15.19.11	20. 0. 0
Credits:				
Sales of Calves	0. 9. 1	0. 4. 3	0. 3. 6	0. 6. 6
Milk from Rearing Cows	2.11.11	3. 5. 7	2. 4. 5	2.17. 7
Total Credits	3. 1. 0	3. 9.10	2. 7.11	3. 4. 1
Total Net Cost per Calf	13.19.11	12.17. 1	13.12. 0	16.15.11

Table 2.

Pail-Feeding Method.
Autumn-born Calves (Winter Period.)

Year of Investigation	1946-47.	1947-48.	1948-49.	1949-50.
Number of Farms	26	26	25	23
Total Number of Calves Costed	147	195	186	182
<u>Food and Grazing Costs:-</u>	£. s. d	£. s. d	£. s. d	£. s. d
Whole Milk	4.11. 5	4. 3. 4	5.15. 6	4.18. 2
Skim Milk	1. 1.11	0.19. 5	0. 6.11	0. 2. 8
Meals & Purchased Concentrates	1. 9. 5	1.12.11	1.10. 5	1.17.10
Home-grown Concentrates	0. 8. 1	0.10. 1	0. 9. 4	0. 5.11
Hay	1. 6. 9	0.16. 1	0.17. 1	0.16. 3
Straw	0. 0. 2	-	0. 0. 9	-
Oats-on-the-straw	0. 2. 7	0. 1. 2	0. 3. 6	0. 0. 7
Roots	0. 1. 2	0. 1. 2	0. 1.11	0. 0. 6
Grazing	-	-	-	-
Total Foods and Grazing	9. 1. 6	8. 4. 2	9. 5. 5	8. 1.11
Direct Labour	2. 6. 5	2.12. 9	3. 8. 8	3.11. 7
Vet. & Medicine Expenses	-	0. 0. 4	0. 1. 5	0. 0. 6
Transport and Commission	-	0. 0. 1	0. 0. 1	0. 0. 2
Miscellaneous Costs	-	0. 0. 2	0. 0. 1	0. 2. 4
Loss on Casualties	0. 2. 6	0. 0. 6	0. 1. 7	0. 2. 7
Total	11.10. 5	10.18. 0	12.17. 3	11.19. 1
Add Value at Birth	2. 0. 0	2. 0. 0	2. 0. 0	2. 0. 0
Total including Value at Birth	13.10. 5	12.18. 0	14.17. 3	13.19. 1

Table 3.

Spring-Born Calves (Summer Period).

Year of Investigation	1946-47.	1947-48.	1948-49.	1949-50.
Number of Farms	26	22	28	23
Total Number of Calves Costed	144	100	131	109
<u>Food and Grazing Costs:-</u>	£. s. d	£. s. d	£. s. d	£. s. d
Whole Milk	2.15. 5	3. 2. 3	3.16. 5	5.12. 3
Skim Milk	1. 7. 9	1.19.11	0.19. 5	0. 5. 8
Meals & Purchased Concentrates	0.17. 9	0.16. 0	1. 4. 5	1. 7. 5
Home-grown Concentrates	0. 7. 5	0. 8.10	0. 2. 5	0. 2. 7
Hay	0.10. 7	0.11. 2	0. 7. 4	0. 6. 2
Straw	0. 0. 1	0. 0. 1	-	-
Oats-on-the-straw	0. 1. 3	0. 0. 1	0. 0. 2	-
Roots	0. 0. 5	0. 0. 2	0. 0. 2	-
Grazing	0. 5. 5	0. 5. 1	0. 3. 3	0. 2. 3
Total Foods and Grazing	6. 6. 1	7. 3. 7	6.13. 7	7.16. 4
Direct Labour	2. 1. 8	2.18. 2	3. 1.10	4. 1. 6
Vet. & Medicine Expenses	-	0. 0. 2	0. 1. 1	0. 0. 2
Transport and Commission	-	0. 0. 1	-	0. 3. 3
Miscellaneous Costs	-	0. 0. 2	0. 0. 5	0. 2.11
Loss on Casualties	0. 2.10	0. 2. 6	0. 1. 9	0. 6. 4
Total	8.10. 7	10. 4. 8	9.18. 8	12.10. 6
Add Value of Calf at Birth	2. 0. 0	2. 0. 0	2. 0. 0	2. 0. 0
Total including Value at Birth	10.10. 7	12. 4. 8	11.18. 8	14.10. 6

Tables 4, 5 and 6.

Costs of Raising Calves from 6 months to 12 months of
Age. Average Costs per Calf Reared.

Table 4.

'Suckling' Group.

Year of Investigation	1946-47.	1947-48.	1948-49.	1949-50.
Number of Farms	30	25	24	21
Total Number of Calves Costed	564	449	478	430
<u>Food and Grazing Costs:-</u>	£. s. d	£. s. d	£. s. d	£. s. d
Purchased Meals & Concentrates	0. 1. 8	0. 2. 10	0. 6. 2	0. 11. 0
Home-grown Concentrates	0. 5. 9	0. 9. 11	0. 16. 8	0. 19. 9
Oats-on-the-straw	1. 19. 9	0. 11. 10	0. 11. 6	0. 12. 6
Hay	2. 1. 10	2. 2. 10	2. 5. 8	2. 16. 4
Straw	0. 1. 10	0. 1. 6	0. 1. 3	0. 1. 3
Roots	0. 9. 0	0. 12. 9	1. 1. 6	0. 15. 5
Grazing	0. 1. 4	0. 2. 5	0. 1. 5	0. 0. 5
Total Foods & Grazing	5. 1. 2	4. 4. 1	5. 4. 2	5. 16. 8
Direct Labour	2. 10. 8	2. 7. 1	2. 7. 9	2. 12. 6
Loss on Casualties	0. 5. 8	0. 4. 8	-	0. 0. 11
Miscellaneous Costs	0. 3. 2	0. 1. 11	0. 2. 7	0. 2. 2
Total All Costs	8. 0. 8	6. 17. 9	7. 14. 6	8. 12. 3

Table 5.

Pail-Feeding Group - Autumn-born (Summer Period.)

Year of Investigation	1946-47.	1947-48.	1948-49.	1949-50.
Number of Farms	26	26	25	23
Total Number of Calves Costed	165	163	188	161
<u>Food and Grazing Costs:-</u>	£. s. d	£. s. d	£. s. d	£. s. d
Skim Milk	0. 9. 2	0. 0. 9	0. 3. 8	-
Purchased Meals & Concentrates	0. 8. 7	0. 10. 0	0. 10. 4	0. 7. 0
Home-grown Concentrates	0. 2. 7	0. 3. 4	0. 0. 4	0. 0. 5
Hay	0. 3. 11	0. 4. 7	0. 0. 10	0. 3. 6
Straw	-	-	-	-
Oats-on-the-Straw	0. 0. 4	0. 0. 5	-	0. 0. 1
Roots	0. 0. 5	0. 0. 3	-	-
Grazing	0. 17. 11	0. 18. 0	0. 13. 11	0. 9. 10
Total Foods and Grazing	2. 2. 11	1. 17. 4	1. 9. 1	1. 0. 10
Direct Labour	0. 16. 2	0. 14. 5	1. 0. 6	1. 1. 11
Vet. & Medicine Expenses	0. 0. 6	0. 0. 9	0. 0. 10	0. 1. 1
Transport and Commission	-	0. 0. 7	0. 0. 3	0. 0. 6
Miscellaneous Costs	-	-	0. 0. 3	0. 1. 5
Loss on Casualties	0. 2. 2	0. 5. 8	0. 1. 10	0. 3. 4
Total All Costs	3. 1. 9	2. 18. 9	2. 12. 9	2. 9. 1

Table 6.

Pail-feeding Group - Spring-born (Winter Period.)

Year of Investigation	1946-47.	1947-48.	1948-49.	1949-50.
Number of Farms	26	22	28	23
Total Number of Calves Costed	138	114	137	113
<u>Food and Grazing Costs:-</u>	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Skim Milk	0. 1. 3	0. 4. 9	0. 1. 6	-
Purchased Meals & Concentrates	0.13. 3	0.11. 4	0.13. 8	0.16. 3
Home-grown Concentrates	1. 3. 1	1. 2. 3	0.11. 5	0.15. 2
Hay	2. 3. 2	2. 3.11	1.14. 9	1.13. 6
Straw	0. 3. 9	0. 6. 6	0. 7. 1	0. 4. 4
Oats-on-the-straw	0. 7. 8	0. 6. 5	0. 5. 2	0. 1. 3
Roots	0. 8. 3	0. 5.10	0. 9.11	0. 8. 2
Grazing	0. 0. 3	0. 0.11	0. 0. 5	0. 0. 4
Total Foods and Grazing	5. 0. 8	5. 1.11	4. 3.11	3.19. 0
Direct Labour	2. 4. 0	2.18. 3	3.11. 3	4.10. 8
Vet. & Medicine Expenses	0. 0. 7	0. 0. 2	0. 0.11	0. 0. 6
Transport and Commission	0. 0. 1	-	0. 0. 3	0. 0. 1
Miscellaneous Costs	-	-	-	0. 3. 2
Loss on Casualties	0. 1. 7	0. 1. 8	0. 2. 8	-
Total All Costs	7. 6.11	8. 2. 0	7.19. 0	8.13. 5

Tables 7, 8 and 9.

Cost of Raising Cattle from 12-18 months of age.
Average Costs per Animal.

Table 7.

On farms where calves were suckled (Summer Period.)

Year of Investigation	1946-47.	1947-48.	1948-49.	1949-50.
Number of Farms	30	25	24	21
Total Number of Cattle Costed	479	396	389	378
<u>Food and Grazing Costs:-</u>	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Oats-on-the-straw	-	0. 0. 1	-	-
Hay	-	0. 0. 2	-	0. 0. 1
Grazing	1. 2.10	1. 2.10	1. 1. 7	1. 4. 1
Total Foods and Grazing	1. 2.10	1. 3. 1	1. 1. 7	1. 4. 2
Direct Labour	0. 7. 2	0.10. 2	0.10.11	0.11. 4
Vet. & Medicine Expenses	0. 0. 3	0. 0. 5	0. 0.10	0. 0. 1
Transport & Other Expenses	0. 2. 3	0. 2. 6	0. 4. 2	0. 2. 2
Loss on Casualties	0. 0. 9	-	0. 1. 4	0. 0.11
Total All Costs	1.13. 3	1.16. 2	1.18.10	1.18. 8

Table 8.

On Farms where Calves were reared by pail-feeding.
Autumn-born. (Winter Period.)

Year of Investigation	1946-47.	1947-48.	1948-49.	1949-50.
Number of Farms	26	24	32	21
Total Number of Cattle Costed	163	144	180	159
<u>Food and Grazing Costs:-</u>	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Purchased Concentrates	0. 2. 5	0. 0. 3	0. 3. 3	0. 6. 5
Home-grown Concentrates	0.10. 0	0.11.10	0. 5. 9	1. 5.10
Hay	1.15. 6	3. 0. 4	2. 1. 2	2. 1. 2
Straw	0.10. 1	0.10. 5	0. 9. 2	0. 7. 2
Oats-on-the-straw	0. 8. 3	0. 5. 8	0. 5. 9	0. 1. 3
Roots	0. 6. 1	0. 6. 0	0. 9. 7	0. 7. 2
Grazing	0. 3. 7	0. 7. 6	0. 2. 6	0. 3. 2
Total Foods and Grazing	3.15.11	5. 2. 0	3.17. 2	4.12. 2
Direct Labour	2. 1. 7	2.18. 5	2.10. 4	2.16. 5
Vet. & Medicine Expenses	0. 0. 6	0. 0.10	0. 0.10	0. 1. 2
Transport and Other Expenses	0. 0. 4	0. 0. 7	0. 0. 6	0. 1. 9
Loss on Casualties	0.10. 0	0. 3. 8	-	-
Total All Costs	6. 8. 4	8. 5. 6	6. 8.10	7.11. 6

Table 9.

Spring-Born. (Summer Period.)

Year of Investigation	1946-47.	1947-48.	1948-49.	1949-50.
Number of Farms	26	22	26	23
Total Number of Cattle Costed	157	124	126	105
<u>Food and Grazing Costs:-</u>	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Purchased Concentrates	-	0. 0. 8	0. 0. 1	0. 2. 4
Home-grown Concentrates	-	0. 1. 4	-	-
Hay	-	0. 1. 1	0. 0. 1	-
Straw	-	0. 0. 1	-	-
Oats-on-the-straw	-	0. 0. 4	-	-
Roots	-	0. 0. 1	-	-
Grazing	1. 0. 4	1. 1. 7	1. 2. 6	0.18. 0
Total Foods & Grazing	1. 0. 4	1. 5. 2	1. 2. 8	1. 0. 4
Direct Labour	0.11. 2	0.15. 8	0.18.11	1. 0. 6
Vet. & Medicine Expenses	0. 0. 2	0. 0.10	0. 0. 9	0. 0. 2
Transport & Other Expenses	0. 1. 6	0. 1. 7	0. 2. 2	0. 2. 0
Loss on Casualties	0. 9. 7	0. 3. 5	0. 9. 8	0. 4. 9
Total All Costs	2. 2. 9	2. 6. 8	2.14. 2	2. 7. 9

Tables 10, 11 and 12.

Costs of Raising Cattle from 18-24 months of age.
Average Costs per Animal.

Table 10.

'Suckling' Group (Winter Period.)

Year of Investigation	1946-47.	1947-48.	1948-49.	1949-50.
Number of Farms	30	25	23	21
Total Number of Cattle Costed	298	281	237	266
<u>Food and Grazing Costs:-</u>	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Purchased Concentrates	0. 1.11	-	-	0. 2.11
Home-grown Concentrates	0. 0. 2	0. 1. 6	0. 2.11	0. 1. 8
Oats-on-the-straw	1.10. 8	0.11. 6	0.14. 2	0.11. 7
Hay	1. 3.10	1.17. 1	1.12.10	2. 2. 2
Straw	0.16. 1	0.17. 5	0.16. 4	0.12. 2
Roots	0.16. 7	0. 5. 5	0. 5. 3	0. 3. 6
Grazing	0.10.11	0.11.10	0. 9. 7	0. 8. 8
Total Foods and Grazing	5. 0. 2	4. 4. 9	4. 1. 1	4. 2. 8
Direct Labour	2. 4. 2	2. 9.10	2. 3. 0	2.14.11
Vet. & Medicine Expenses	0. 0. 5	0. 0. 7	0. 0. 6	0. 0. 3
Transport & Other Expenses	0. 4.10	0. 4.10	0. 3. 9	0. 5. 1
Loss on Casualties	0. 9. 2	-	0. 4.10	0. 4. 5
Total All Costs	7.18. 9	7. 0. 0	6.13. 2	7. 7. 4

Table 11.

'Pail-feeding' Group.
Autumn-Born. (Summer Period.)

Year of Investigation	1946-47.	1947-48.	1948-49.	1949-50.
Number of Farms	26	20	21	23
Total Number of Cattle Costed	86	131	111	124
<u>Food and Grazing Costs:-</u>	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Purchased Concentrates	-	-	0. 1. 1	-
Hay	-	-	0. 1. 2	0. 0. 3
Oats-on-the-straw	-	-	0. 0. 2	-
Grazing	1. 0. 4	1. 9. 7	1. 0.11	1. 4. 0
Total Foods and Grazing	1. 0. 4	1. 9. 7	1. 3. 4	1. 4. 3
Direct Labour	0.12. 0	1. 3. 3	0.15.10	0.19. 9
Vet. & Medicine Expenses	0. 0. 1	0. 0. 3	0. 0. 6	0. 0. 5
Transport & Other Costs	0. 0. 5	0. 1. 8	0. 1. 7	0. 1. 9
Loss on Casualties	0. 5. 2	-	-	-
Total All Costs	1.18. 0	2.14. 9	2. 1. 3	2. 6. 2

Table 12.

'Pail-feeding' Group.
Spring-born. (Winter Period.)

Year of Investigation	1946-47.	1947-48.	1948-49.	1949-50.
Number of Farms	26	19	24	20
Total Number of Cattle Costed	135	108	92	78
<u>Food and Grazing Costs:-</u>	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Purchased Concentrates	-	-	0. 3. 1	0. 6. 1
Home-grown Concentrates	0. 8. 10	0. 14. 3	0. 16. 7	0. 15. 11
Hay	1. 14. 8	2. 11. 4	2. 0. 8	2. 1. 3
Straw	0. 10. 3	0. 10. 7	0. 13. 5	0. 9. 2
Oats-on-the-straw	0. 14. 10	0. 2. 8	0. 6. 7	0. 3. 3
Roots	0. 5. 1	0. 8. 5	0. 13. 8	0. 6. 7
Grazing	0. 8. 2	0. 11. 1	0. 7. 11	0. 5. 9
Total Foods and Grazing	4. 1. 10	4. 18. 4	5. 1. 11	4. 8. 0
Direct Labour	2. 0. 10	2. 10. 7	3. 18. 10	4. 1. 3
Vet. & Medicine Expenses	0. 0. 2	0. 0. 9	0. 1. 0	0. 0. 3
Transport & Other Costs	0. 1. 0	0. 1. 5	0. 2. 10	0. 2. 7
Loss on Casualties	0. 6. 10	-	0. 4. 4	-
Total All Costs	6. 10. 8	7. 11. 1	9. 8. 11	8. 12. 1

Tables 13 and 14.

Costs of Raising Cattle from 24-30 months of age.
Average Costs per Animal.

Table 13.

'Suckling' Group. (Summer Period.)

Year of Investigation	1946-47.	1947-48.	1948-49.	1949-50.
Number of Farms	30	23	21	19
Total Number of Cattle Costed	201	166	165	154
<u>Food and Grazing Costs:-</u>	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Purchased Concentrates	-	0. 0. 6	0. 2. 0	0. 1. 7
Home-grown Concentrates	-	-	0. 0. 3	0. 0. 3
Oats-on-the-straw	-	0. 0. 7	-	-
Hay	-	0. 0. 2	-	-
Grazing	2. 0. 6	2. 1. 7	1. 19. 6	2. 15. 6
Total Foods and Grazing	2. 0. 6	2. 2. 10	2. 1. 9	2. 17. 4
Direct Labour	0. 11. 11	0. 10. 11	0. 14. 2	0. 17. 0
Vet. & Medicine Expenses	0. 0. 9	-	0. 0. 9	0. 0. 3
Transport & Other Expenses	0. 3. 7	0. 7. 5	0. 3. 1	0. 5. 10
Loss on Casualties	-	-	0. 6. 7	0. 7. 2
Total All Costs	2. 16. 9	3. 1. 2	3. 6. 4	4. 7. 7

Table 14.

'Pail-feeding' Group - Autumn-Born. (Winter Period.)

Year of Investigation	1946-47.	1947-48.	1948-49.	1949-50.
Number of Farms	26	18	15	18
Total Number of Cattle Costed	64	111	84	81
<u>Food and Grazing Costs:-</u>	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Purchased Concentrates	0. 1. 3	0. 1. 9	0. 2. 1	0. 0. 1
Home-grown Concentrates	0. 0. 2	0. 5. 5	0. 2. 6	0. 5. 11
Hay	0. 18. 7	2. 12. 6	1. 14. 7	2. 13. 5
Straw	0. 8. 0	0. 7. 9	0. 11. 9	0. 13. 6
Oats-on-the-straw	0. 8. 2	0. 1. 9	0. 2. 2	0. 0. 6
Roots	0. 1. 10	0. 4. 8	0. 7. 2	0. 5. 4
Grazing	1. 4. 2	1. 1. 7	1. 1. 9	0. 11. 1
Total Foods and Grazing	3. 2. 2	4. 15. 5	4. 2. 0	4. 9. 10
Direct Labour	1. 8. 5	2. 0. 4	1. 18. 2	2. 12. 7
Vet. & Medicine Expenses	0. 0. 2	0. 0. 4	0. 0. 8	0. 0. 7
Transport and Other Costs	0. 0. 10	0. 1. 11	0. 1. 10	0. 1. 11
Loss on Casualties	-	0. 5. 0	0. 2. 10	0. 4. 6
Total All Costs	4. 11. 7	7. 3. 0	6. 5. 6	7. 9. 5

Tables 15 and 16.

Aggregate of Average Costs per Animal.

Table 15.

'Suckling' Group. (Spring-born.)

Age-group.	Spring 1946 to Autumn 1948. (2½ years)	Spring 1947 to Autumn 1949. (2½ years)	Spring 1948 to Spring 1950. (2 years)
	£. s. d.	£. s. d.	£. s. d.
Calves 0- 6 months	13. 19. 11	12. 17. 1	13. 12. 0
" 6-12 "	8. 0. 8	6. 17. 9	7. 14. 6
Cattle 12-18 "	1. 16. 2	1. 18. 10	1. 18. 8
" 18-24 "	7. 0. 0	6. 13. 2	7. 7. 4
Total to 2 years	30. 16. 9	28. 6. 10	30. 12. 6
Cattle 24-30 months	3. 6. 4	4. 7. 7	
Total to 2½ years	34. 3. 1	32. 14. 5	

Table 16.

'Pail-Feeding' Group.

Age-group.	Spring-born Cattle - 2-year Aggregates.		Autumn-Born Cattle - 2-year and 2½-year Aggregates.		
	Spring 1946: to Spring 1948	Spring 1947: to Spring 1949	Spring 1948: to Spring 1950	Autumn 1946: to Spring 1949	Autumn 1947: to Spring 1950
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Calves 0 - 6 months	10.10.7	12.4.8	11.18.8	13.10.5	12.18.0
" 6 - 12 "	7.6.11	8.2.0	7.19.0	3.1.9	2.18.9
Cattle 12 - 18 "	2.6.8	2.14.2	2.7.9	8.5.6	6.8.10
" 18 - 24 "	7.11.1	9.8.11	8.12.1	2.1.3	2.6.2
Total to 2 years	27.15.3	32.9.9	30.17.6	26.18.11	24.11.9
				Cattle 24 - 30 months	6.5.6 : 7.9.5
				Total to 2½ years	33.4.5 : 32.1.2

APPENDIX C.

HAND-FEEDING OF CATTLE AND CALVES. AVERAGE
CONSUMPTION PER ANIMAL.

Table 1.

Calves up to 6 months old. ('Pail-Feeding' Group.)

Type of Food.	Spring-born.				Autumn-born.			
	1946-7:	1947-8:	1948-9:	1949-:	1946-7:	1947-8:	1948-9:	1949-:
Whole Milk galls.	66	60	69	101	46	43	63	46
Skim Milk "	65	78	38	11	52	38	14	5
Purch. Concen. lb.	84	85	134	130	140	162	168	145
Home-grown "	84	88	22	22	84	102	89	56
Hay "	336	358	220	165	600	560	460	450
Straw "	3	2	2	-	10	-	44	-
Oats-on-the-straw "	22	4	4	-	56	34	78	16
Roots "	34	10	3	-	90	73	100	32

Note: For older cattle data are expressed in 'cwt.' for most foods. For the calves up to 6 months old solid food consumption is expressed in lb.

Table 2.

Calves from 6-12 months old. 'Pail-feeding' Group.

Type of Food.	Spring-Born.				Autumn-Born.			
	1946-7:	1947-8:	1948-9:	1949-:	1946-7:	1947-8:	1948-9:	1949-:
Skim Milk galls.	3	9	3	-	22	2	7	-
Purchased Conc. lb.	79	60	79	67	45	56	58	34
Home-grown " cwt.	2.2	2.0	1.0	1.4	0.2	0.3	-	-
Hay "	12.0	13.8	9.4	8.2	1.2	1.4	0.2	0.8
Straw "	2.0	3.4	3.7	2.0	-	-	-	-
Roots "	5.4	3.4	5.0	4.4	-	0.2	-	-
Oats-on-the-straw "	1.5	1.5	1.0	0.3	-	0.1	-	-

Table 3.

Calves from 6-12 months old. 'Suckling' Group.

Type of Food.		:1946-47:	:1947-48:	:1948-49:	:1949-50
Purchased Concentrates	lb.	: 11	: 18	: 33	: 45
Home-grown	"	: 0.5	: 0.9	: 1.4	: 1.8
Oats-on-the-straw	"	: 7.7	: 2.8	: 2.2	: 3.0
Hay	"	: 12.1	: 13.4	: 12.3	: 13.1
Straw	"	: 1.1	: 0.8	: 0.7	: 0.6
Roots	"	: 5.9	: 7.3	: 10.1	: 8.6

Table 4.

Calves 12-18 months old. Autumn-Born.
'Pail-feeding' Group.

Type of Food.		:1946-47:	:1947-48:	:1948-49:	:1949-50
Purchased Concentrates	lb.	: 67	: -	: 23	: 25
Home-grown	"	: 1.2	: 1.5	: 0.5	: 2.6
Hay	"	: 11.4	: 16.5	: 10.7	: 10.0
Straw	"	: 5.2	: 5.4	: 4.8	: 3.5
Oats-on-the-straw	"	: 1.0	: 1.4	: 1.1	: 0.3
Roots	"	: 4.2	: 3.5	: 4.7	: 3.9
Skim milk	galls.	: 22	: -	: -	: -

Table 5.

Cattle 18-24 months old. Spring-Born.

Type of Food.		'Pail-feeding' Group.				'Suckling' Group.			
		:1946-7:	:1947-8:	:1948-9:	:1949-50	:1946-7:	:1947-8:	:1948-9:	:1949-50
Purch. Concentrates	lb.	: -	: -	: 23	: 23	: 16	: -	: -	: 11
Home-grown	"	: 0.8	: 1.3	: 1.4	: 1.6	: -	: 0.1	: 0.3	: 0.1
Hay	"	: 10.3	: 16.1	: 11.0	: 10.2	: 6.8	: 11.6	: 8.9	: 14.3
Straw	"	: 5.7	: 5.5	: 7.0	: 4.3	: 8.8	: 9.5	: 8.5	: 5.8
Oats-on-the-straw	"	: 2.8	: 0.6	: 1.3	: 0.8	: 5.7	: 4.3	: 2.7	: 2.8
Roots	"	: 3.3	: 4.9	: 6.8	: 3.6	: 10.9	: 3.1	: 2.4	: 1.5

Table 6.

Cattle 24-30 months old. Autumn-Born.
'Pail-feeding' Group.

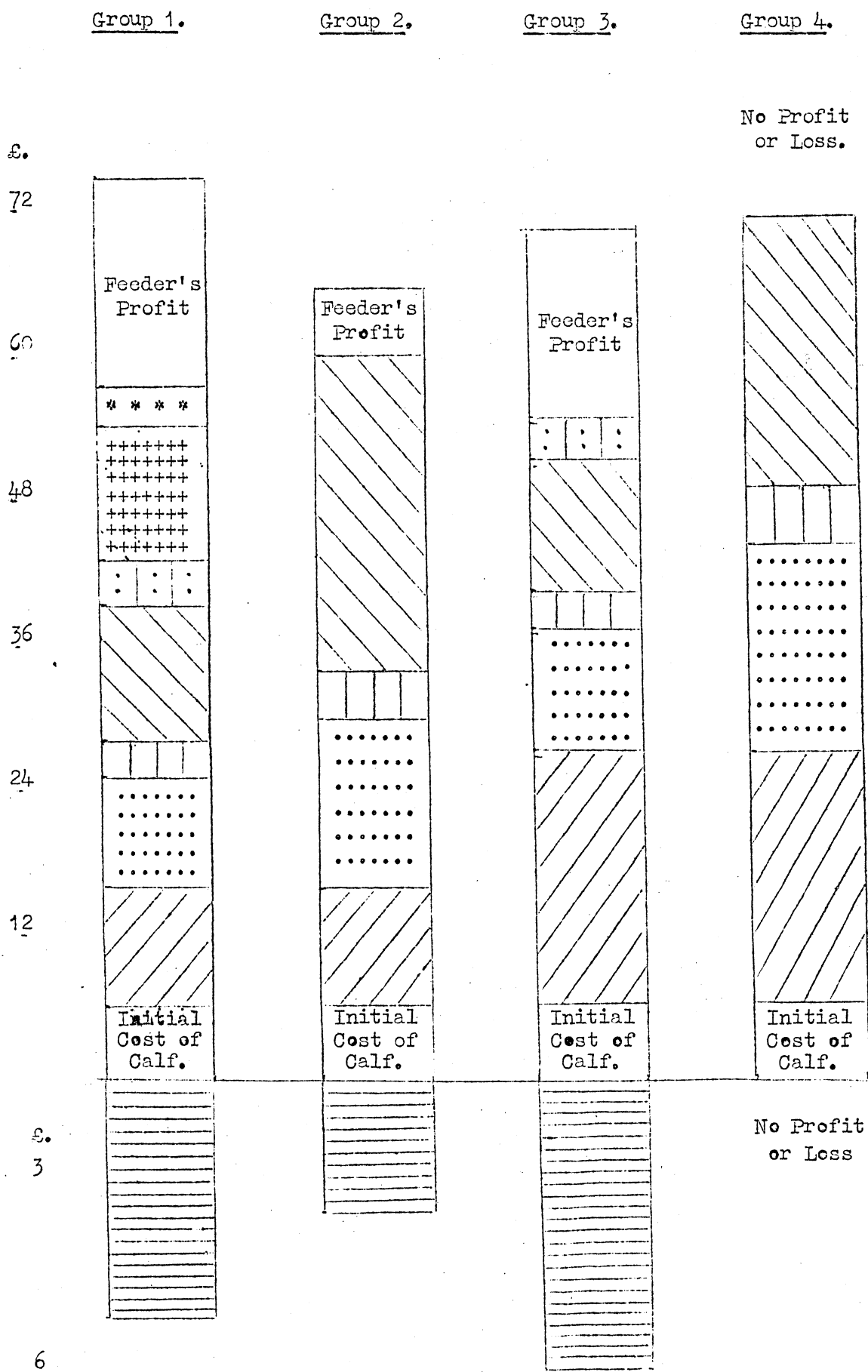
Type of Food.		:1946-47:	:1947-48:	:1948-49:	:1949-50
Purchased Concentrates	lb.	: 9	: 11	: 12	: neg.
Home-grown	"	: neg.	: 1.0	: 0.3	: 0.7
Hay	"	: 5.5	: 16.5	: 8.9	: 12.8
Straw	"	: 4.8	: 4.0	: 6.1	: 6.2
Oats-on-the-straw	"	: 1.5	: 0.4	: 0.4	: neg.
Roots	"	: 1.3	: 2.8	: 3.2	: 2.7

neg. = negligible.

(P. T. O.)

Chart.

Diagrammatic Representation of Costs and Returns on Beef Cattle in Cambridge Beef Experiment.



- Cost of Calf Period
- Cost of 1st Winter
- Cost of 2nd Summer
- Cost of 2nd Winter
- Cost of 3rd Summer
- Cost of 3rd Winter
- Cost of 4th Summer
- Profit per year of Animal's Life

This chart is based on figures found in the Journal of the Royal Agricultural Society, Vol. 111, 1950.

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