Cattle
Cost of Production
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AN INVESTIGATION INTO THE ECONOMICS OF WINTER FED CATTLE IN DEVON AND CORNWALL.

by

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I. INTRODUCTION

Beef production is not generally associated with the South West which is, traditionally, a store cattle producing area, yet some fattening of cattle has been carried on but for how long and to what extent it is difficult to say. The late Sir Henry Rew who came to Devon to study the position of West Country farming during the depression of the '90s reported thus "I found farmers in North Devon turning their attention to the fattening of the stock they rear instead of sending them away to be fattened".*

That this movement which Rew records, at least as far as cattle were concerned, never fully developed, is evidenced by the fact that the South West remained largely a source of store cattle supplies. In so far as former store rearers did turn their attention to fattening the cattle they reared it is probable that summer rather than winter fattening was the adopted system. This is not surprising since during the latter part of the 19th and during most of the 20th centuries (except for some arrest during the first world war) the tillage areas of the South Western counties declined, and the area of grassland, particularly permanent grass, correspondingly increased.

The decline in the demand for store cattle in the inter war years, particularly in the decade immediately before the 1939/45 world war, and the relatively more favourable price level of milk compared with beef forced South Western farmers to look towards the milk market in their efforts to maintain the level of their incomes. Yet the prevalent breeds of cattle kept were the dual purpose South Devon and Shorthorn, and the Devon, all potential beef producers, and therefore sources of supply for beef stores.

Through all these changes two forms of cattle fattening enterprises have, however, persisted. (1) On the better class grassland areas where, for various reasons, milk production has not developed, and (2) the more predominantly arable areas of Mid Devon and North Cornwall. Examples of cattle fattening on grass are to be found on the Exminster marshes, and some of the river valley areas, e.g. the Torridge, Tavy, Exe, Culme, Creedy, around Launceston, Tavistock and several areas in South Devon and South Cornwall. The extent to which winter fattening is associated with this system varies, but generally it takes the form of finishing off animals which have failed to get fat on the grass. In the arable districts the general system of cattle management has developed along more complex lines. It certainly does not follow the traditional pattern of yard fattening which is associated with arable farming in many parts of England. In the South West winter beef production is less clearly defined and is more an integral part of a mixed farming system based on livestock rather than sale crop production.

Numbers of studies in different parts of the country into the economics of winter beef production have been undertaken in recent years, but the enterprises studied have mainly been associated with large scale cash crop farming, and largely under war time conditions of economy. The results of these investigations have been consistent in so far as they have shown the traditional system of buying

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*R.H. Rew "The Agricultural situation in the West of England", Journal of the Bath and West of England Society. Vol V, 1894/95.

store cattle in the autumn and feeding them in yards, largely on the produce of the arable land, to be unprofitable. In fact no enterprise can have shown such a consistent adverse cash position.

That the economic assessment of winter fattening cannot be based solely on accounting results is evidenced by the fact that otherwise rational farmers, in the arable areas of England, continue to buy and fatten cattle despite the overwhelming evidence of the cost accountant that the practice is unprofitable. The Economist has sought to justify these apparent unbusinesslike practices by a process of reasoning which presupposes certain desirable farming practices and results, which must be associated with conditions in our farm economy.

The whole business is, of course, most complex as would be expected from a mixture of finance, economics and farming. The gist of the explanation is that the winter fattener of cattle does not set out to make money but "muck" with which to maintain the fertility of the arable land. The loss incurred on the fattening beast becomes so much cost per ton for dung which in turn is reflected in increased yields and revenue from crops. It is doubtful whether the same or similar considerations can be applied to winter cattle fattening enterprises in an area such as the South West where the arable cropping is generally subsidiary to stock raising.

This investigation has been undertaken, partly at least, with the object of establishing comparable basic data relating to costs and returns for winter cattle fattening enterprises under conditions existing in the South West. Already this department has completed a fairly intensive study of store rearing systems, costs and returns.* These studies, together with 12 years intensive investigation into the economics of milk production enterprises, constitutes a considerable volume of valuable basic economic data relating to the cattle industry in the farming economy of the South West.

II. GENERAL

When the investigation was begun, the aim was to enlist the co-operation of at least 30 farmers, feeding cattle to grade condition during the winter months, who would be willing to supply costs. At that time this number did not seem particularly ambitious. Much preliminary investigation had to be undertaken to find out where and who the winter feeders were. The subsequent contacts showed only too plainly that winter fattening on any scale was becoming a rare phenomenon on farms in the South West, and that it persisted as a positive system mainly in the more arable districts of Mid Devon and North and South Cornwall, and on those farms which had not gone in for milk production.

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*"An investigation into the costs of rearing cattle in three areas of Devon", R.R. Jeffery, Part I. Farmers Report No. 45, April 1946, and "An investigation into the costs of rearing cattle in three areas of Devon", R.R. Jeffery, Part 2. Farmers Report No. 48, June 1947.

In the traditional cattle rearing areas of North Devon and North East Cornwall winter fattening persisted largely as the cinderella of summer feeding, while milk would appear to be well on the way to ousting beef, particularly on the medium size and small farms. The three bad corn harvests of 1944 to 1946 inclusive, but particularly the disastrous harvest of 1946 had largely contributed to its lapsing; lack of corn and fodder was the most common immediate reason given by farmers who had decided to abandon the practice. Cattle not graded out off grass can either be fattened indoors or kept in store condition until the following spring on the roughage available. Provided there was no loss of condition the latter alternative probably pffered some attraction to those farmers who could reasonably look to some spare grass in the spring.

To what extent the revised prices which came into operation on 1st April compensated for the adverse position which resulted from the abnormally severe winter it is difficult to say; winter cattle feeders could certainly not be blamed for not forecasting the weather. A number of farmers who tentatively agreed to keep costs decided at the last moment that they would not attempt to fatten their cattle after all, and at least 5 of the 30 farmers who actually commenced keeping costs either kept their cattle through the winter as stores, or had been unable to finish them off before again turning out to grass. It is obvious that the more arable type farms were better able to withstand the pressure on food supplies caused by the severe weather than the grazing and rearing farms.

1) Number and location of feeding enterprises studied

The main part of this report deals with the financial and physical data relative to winter beef production on 24 farms. Of these 7 are located in the Launceston - Bideford area of North East Cornwall and North Devon, a traditional rearing and grazing area, 5 are located in the more arable area between Exeter and North Tawton, one near Plymouth in South Devon, 4 in the mixed stock and arable area of South Cornwall and 7 in the Newquay - Wadebridge arable and stock rearing district of North Cornwall.

Costs were also obtained from a large feeding unit in the Launceston area, which included over 60 cattle fattened. This farm has been omitted from the report for sampling reasons only. Including as it did, nearly one quarter of all cattle costed, it was considered that this unit was not representative of the units studied because of the considerable difference in size, and that it would be unfair to include such a unit in the general average.

Two further enterprises have supplied data, but in so far as the cattle in these units were finished on grass, and the accounts have not yet been completed, the results of these enterprises will be published elsewhere at a later date.

The number of cattle costed on each farm ranged from 3 to 22.

Number costed per farm

Number	No. of farms
Less than 5	7
5 - 10	10
11 - 16	5
17 - 22	2
	24

These numbers do not necessarily include the total cattle fattened on these farms during the winter period since the investigation was confined to lots convenient for costing. On the majority of farms, however, all the cattle fattened have been included.

2) Numbers and types of cattle costed

Of the 215 cattle to which this report refers, 133 were Devons, 72 South Devons, and 10 cross breds. Steers outnumbered heifers by 2 to 1; among the heifers are included a small proportion of cow heifers and one or two odd cows. The steers were a little over 1 cwt heavier at the commencement of the feeding period than the heifers and they were given a higher value per cwt compared with the heifers. The average intake or store value of the steers was £41 3 0 compared with £39 2 0 for the heifers.

Slightly more than 60% of these cattle were purchased, the remainder were home reared, but not all home bred. Only a small proportion of the cattle purchased were bought and put straight into yards. In fact a considerable proportion had had varying periods at grass. Some attempt was made to obtain the ages of these cattle, but it is difficult to obtain the precise age for individual groups, and ages seemed to vary considerably within groups. In fact there was considerable variation in age and weight. Average age ranged from 2 - 3½, while 2½ years would appear the most common age. The South Devons in particular, were on average older and heavier animals.

3) Weights, live weight increases and length of feeding period

The initial (intake or store weight) and final weight of the cattle costed, together with the average live weight increase for steers, heifers and all cattle are set out in Table 1.

Table 1. Average store and final disposal weights and live weight increases. 215 cattle.

	No	Estimated initial weight		Final disposal weight		Estimated live weight increase	
		Total	Per head	Total	Per head	Total	Per head
		cwts	cwts	cwts	cwts	cwts	cwts
Steers	144	1532.5	10.64	1768.00	12.28	235.50	1.64
Heifers	71	675.0	9.51	763.75	10.76	88.75	1.25
All Cattle	215	2207.5	10.27	2531.75	11.77	324.25	1.50

The average live weight increase was 1½ cwts per head for all cattle and was higher for steers than heifers. The increase ranged as between farms from just over ½ cwt to 2¾ cwt. Obviously the amount of increase for any individual animal or group of animals will depend upon the rate of increase, that is, the amount of weight added each day or week, and the number of days or weeks the animals are feeding.

Table 2. Range of live weight increase

Live weight increase	½ cwt - 1 cwt	1 cwt - 1½ cwt	1½ cwt - 2 cwt	2 cwt - 2½ cwt	2½ cwt - 3 cwt	Total
No of farms	3	11	5	4	1	24

Table 3 sets out the average length of the feeding period and the average live weight increase per head per week for all cattle costed and for heifers and steers separately.

Table 3. Length of feeding period and live weight increase

	All cattle	Steers	Heifers
Length of feeding period	14.14 wks	15.29 wks	11.86 wks
Live weight increase per head per week (lbs)	11.97 lbs	12.01 lbs	11.90 lbs

The average length of the feeding period was a little over 3 months. This comparatively short fattening period largely reflects the system of winter beef cattle production in the South West. Very few cattle were housed before Mid November. In fact the majority of the cattle were brought in between Mid November and the beginning of December. Grass was plentiful last Autumn (1946) and grazing conditions were good, and many of the cattle were in good forward store condition. As between groups, the average initial or store weight ranged from 8.8 cwts to 14.5 cwts.

The steers were kept longer, on the average, than the heifers and were fed to heavier weights. This may be entirely due to the sample and may possess no particular significance.

The range in length of the feeding period as between farms is given in Table 4.

Table 4. Range in length of feeding period as between farms

Weeks	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	Total
No of farms	3	4	4	3	3	4	2	1	24

The range shows considerable variability and indicates the considerable diversification in the systems within the group of farms studied. The shortest feeding period was from 15th Nov. to 14th Jan. and the longest period 1st Nov. to 7th Apr.

4) Housing

The traditional "yarding" system was hardly encountered on these farms. On 16 of the 24 farms studied the majority of the feeding cattle were tied up in ordinary shippons, frequently alongside other cattle. In fact 140 of the 215 cattle were tied up in this way. The majority of the cattle were let out to water each day and on several of the farms the feeding cattle went out to grass for a few hours each day at least for part of the period. On two farms each animal had a loose box to itself while two others used loose boxes with 2 beasts per box. Of the remaining 42 cattle, the majority were housed in open courts with some kind of yard, but with little straw.

5) An explanation of costing terms and method

In so far as the economic analysis of winter beef production depends upon correct accounting data, some explanation of the accounting techniques employed and their limitation seems called for. The costing of winter fed cattle, particularly where the fattening is undertaken on a small scale, but not as a main purposeful enterprise, presents a number of difficulties. The following outline of the methods adopted, together with some general observations will help to a better appreciation of the real meaning of the data presented in this report. These explanations should be interpreted against the general background of farming practices of the South West.

Ingoing cost of animals. Ideally the value put on the animals coming into the yard or shippon for fattening should be (a) the actual purchase price in those instances where the cattle are bought, or (b) the cost of production of the store animal where the cattle are homebred. In practice, however, cattle are seldom purchased and put straight in to fatten, and in the case of home reared stores the costs of rearing the animals is generally unknown. The alternative method of using current market prices is probably the most practical one despite the fact that this method may mask profits or losses on the store animal which should be reflected in the final cost of the fattening process.

The actual method used in this investigation was to price the very forward stores, i.e. partly fat animals, on their estimated grading out value, while less forward stores were given values related to current market prices for animals of similar type and quality. Probably a proportion of the latter were slightly over-valued. Bought cattle were frequently valued at little more than their purchase price, even after several weeks of grazing on the farm. The reason for this is that store cattle prices tended to fall as the year advanced.

Cost of foods. The bulk of the foods fed to winter feeding cattle are home produced. The cost and profitability of winter beef production depends to a very considerable degree on the level of cost with which these foods are charged to the cattle. It is very difficult to get any measurement of agreement on this subject and various compromises are resorted to according to the purpose for which the data are required. But the cost accountant is usually forced to such compromise for practical expediency in so far as the complete data are seldom available.

From a pure cost accounting point of view, there can only be one cost for homegrown foods fed to livestock, and that is the cost of production of these foods, and any other method of pricing homegrown foods will lead to interminable arguments according to the objectives and interpretation put on the data. The practical difficulties which face the agricultural cost accountant are too well known to need enumeration here, but in so far as costs are available for the various classes of food used, their use in an investigation of this kind must result in data which more approximate the true facts. Whether such a method of charging homegrown foods increases or lowers the final unit cost is incidental. It is the economic interpretation of the position which is important.

In arriving at the cost of producing beef on these farms, therefore, all foods have been charged at cost or estimated cost of production. The actual figures used are as follows:-

Dredge corn			14/6d	per	cwt	Cabbage	£1	10	0	per	ton
Oats			14/6d	"	"	Turnips & Swedes	£1	6	0	"	"
Hay	£4	0	0	"	ton	Mangels	£1	10	0	"	"
Straw	£2	12	0	"	"	Sugar beet tops	£1	6	0	"	"

To the cost of 14/6d per cwt for corn has been added 1/-d for cost of crushing. Manurial residues have been calculated on conventional rates. Corn, hay and straw costs have been obtained by special investigations undertaken by this department and refer to the 1946 crop year. The charges for the various classes of roots have been arrived at from costings investigations undertaken by this department in the past 3-4 years and adjusted for conditions in 1946. Purchased foods have been entered at cost delivered at the farm.

No charge has been made for straw used for litter since it is returned to the land in the form of manure. It is hardly likely that much feeding straw was used for litter, and probably was the straw not used for bedding it would have to be burnt.

Labour. Under this heading has been included only direct labour used in preparing food, feeding, cleaning out, turning cattle in and out for water, etc. Labour used in bringing hay or roots home from field has been ignored since this cost has already been allowed for in the cost

figures for these foods. Labour used in cutting out and carrying in hay and carting in roots from clamp, where the hay or roots have already been carted home at harvest time has, however, been included.

In pricing the labour, allowance has been made for week-end and other overtime and other labour charges such as sickness and holidays.

Miscellaneous charges. Under this heading has been included a Rental charge for yard or shippon estimated on the basis of use made and class of building, marketing charges including lorry hire and labour spent on droving; other incidentals such as veterinary charges, small repairs etc.

Overhead costs. No allowance has been made for any share of the general farm overheads, interest on capital or charges for management. It is not possible, in an enquiry of this kind, to arrive at a fair assessment of overhead costs. In considering the results, therefore, it must be kept in mind that the costs are direct costs only and that the absolute profit or loss position will be further affected by the amount of overheads which this enterprise should carry.

Unfinished cattle. A small proportion of the original cattle became casualties or failed to reach grade condition with the general bulk of the cattle. Both classes have been included for purposes of costs and their values as casualties, or on transfer from the yards, has been taken as their final value.

Weights of cattle. The weight of the cattle as stores had to be estimated. The fat weight, except in calculations of live wright increases, is the actual weighbridge weight, less 28 lbs, i.e. "payment" weight. The live weight increases have been worked out on the basis of the weighbridge weight for fat beasts.

III. FINANCIAL RESULTS

The aggregate financial results for the 24 Winter Cattle fattening enterprises are set out in Table 5.

Table 5. Aggregate financial results of 24 winter cattle fattening enterprises, Devon and Cornwall 1946/47.

	£	s	d		£	s	d
Intake Value 215 cattle	8406	6	8	Disposal Value 215 cattle	10836	2	5
Costs				Manurial Residues	192	4	2
Foods	2991	18	1				
Labour	380	5	0				
Miscellaneous	123	5	0	Margin (Loss)	873	8	2
Total	11901	14	9	Total	11901	14	9

The overall result, as shown by these figures, is a loss of £873 8 2 on fattening 215 head of cattle, which represents a rate of loss equivalent to 10.4% of the initial value of the cattle, or just over £4 per beast. Although this general position is in keeping with the experience of winter cattle fatteners in other parts of the country in recent years, some further analysis of the data collected in this investigation may be useful in so far as it will indicate the causes which give rise to losses in winter cattle fattening in the South West which, after all, are basically the same as those encountered in other areas of the country. In any case the analysis will not be merely repetitive in so far as it does reveal differences in organisation and systems of management which are worth while recording for general interest. For the farmers who have participated in this investigation a fairly detailed analysis is essential to a proper understanding of the general position.

Analysis of costs

An analysis of the costs incurred are set out in some detail in Table 6.

Table 6. Summary of costs, 215 cattle, 1946/47.

	Total			Per head			Per head per week			Per cwt L/W increase			Per Cent
	£	s	d	£	s	d	£	s	d	£	s	d	%
Value of stores	8406	6	8	39	2	0		-			-		71.8
Food costs*													
Hay	695	3	6	3	4	8		4	7	2	2	10	5.9
Straw	16	10	5		1	6			1		1	0	.1
Roots	707	17	9	3	5	10		4	8	2	3	8	6.1
Home grown corn	1275	9	8	5	18	8		8	5	3	18	8	10.9
Bought concs	81	14	9		7	7			6		5	1	.7
Grazing	22	18	0		2	2			2		1	5	.2
Total foods	2799	14	1	13	0	5		18	5	8	12	8	23.9
Labour	380	5	0	1	15	4		2	6	1	3	5	3.2
Miscellaneous	123	5	0		11	6			10		7	7	1.1
Total	11709	10	9	54	9	3	1	1	9	10	3	8	100.0

*Net cost after allowing for manurial residues.

Cost of store animal. Just under 72% of the total cost is represented by the price of the store animal. In other words the majority of the costs of producing a beef animal had been incurred before the final fattening stage is reached.

As between herds the cost or input value of the store cattle varied considerably, the extreme range was from £30 10 0 to £58 0 0. These variations in the store value arise from differences in age, weight and quality of cattle concerned, and there would appear to be considerable variations in each of these factors.

On an average, weight for age, South Devon cattle are heavier than Devon cattle*. The ages of the cattle included in this investigation are, however, only approximate, but the indications are that the majority of the South Devons were older, on an average, than the Devons, and their average weight was just under 2 cwts heavier than the Devons. If the store value of the animals costed be excluded from the total cost, then foods account for nearly 85% of the total cost, while labour accounts for between 11 and 12% of the cost.

	Cost per head			%
	£	s	d	
Food	13	0	5	84.8
Labour	1	15	4	11.5
Miscellaneous		11	6	3.7
	£15	7	3	100.0

Food costs. Most of the food fed was homegrown. Sugar beet pulp was fed on three farms and a little unrationed concentrates were available on a small number of farms. The largest item of expense for foods was for homegrown corn. This consisted largely of dredge corn, i.e. a mixture of barley and oats.

The bulk of the hay fed was "seeds" hay and despite the bad hay harvest in the West Country, most of the hay was of good quality. Some straw was fed on 4 farms only, mainly at the commencement of the feeding period, but the quantity was small, although there may have been some under estimation in this item due to the fact that some of the litter may have been consumed. On the whole the straw was of very poor quality as a result of the disastrous harvest last autumn, and much of it had little more than litter value.

Of the roots fed, mangolds accounted for 85% of the total by volume. The majority of farms fed some mangolds, but swedes were fed on only 5 farms. Turnips and cabbage account for the remainder and a small amount of sugar beet tops was fed on one farm.

A summary of the types and quantities of foods fed are set out in Table 7.

Table 7. Quantities and types of foods consumed

	Total	Per head	Per head per week	Per cwt of L/W gain	lbs per head per day
	tons	cwts	cwts	cwts	lbs
Dredge corn	87.72	8.16	0.58	5.41	9.25
Purchased concs	7.52#	0.69	0.04	0.46	0.80
Total concentrates	95.24	8.85	0.62	5.87	10.05
Hay	198.6	18.47	1.31	12.25	20.95
Straw	6.35	0.59	0.04	0.39	0.67
Roots	469.1	43.64	3.09	28.93	49.48

Includes 2.2 tons of Sugar beet pulp

*See "An investigation into the costs of rearing cattle in three areas of Devon". R.R. Jeffery. Farmers Report No. 48. June 1947.

The average beast consumed about 8.8 cwts of concentrates, 18½ cwts of hay and 43½ cwts of roots. The most frequent combination of foods was crushed dredge corn, mangolds and hay. Of these hay was commonly fed ad lib. A number of farmers turned the fattening cattle out for a part of each day throughout the whole of the fattening period, but particularly during the first two or three weeks. A study of the feeding on individual farms indicates that quite a proportion of the ration was derived from grass in one or two cases.

Total foods amounted to £13 0 5 per head, equivalent to a weekly cost per head of 18/5d, or £8 12 8 per cwt live weight increase. There were wide variations in food cost as between herds as a result of differences in the quantities and types of foods fed. Thus costs of food per head per week ranged from 12/- to 30/-, and per cwt live weight increase the range was from £4 to a little over £17.

The average daily intake of foods in terms of dry matter (excluding any grazing) over all enterprises was 33.2 lbs with a range as between individual enterprises from 18 lbs to 48 lbs.

One of the causes of the comparatively large amounts of food required to put on a cwt of live weight increase on some farms was, of course, the lack of balance in the ration. To make up for the general deficiency in the protein content of the ration, larger quantities of food, particularly the more bulky hay and roots, were fed compared with theoretical requirements.

Labour costs totalled £1 15 4 per beast fattened, or 2/6d per head per week, and represents just over 3% of the total cost. Under this heading has been included all time spent in preparing foods (excluding bruising and crushing corn, which has been calculated and added to the production costs of the corn) including bringing in hay from stack and roots from clamp if these are adjacent to the shippons, feeding cattle, cleaning out, and any other direct labour of this kind. The total direct labour hours amounted to 3802 on 215 cattle, covering 3034 cattle weeks. This is equivalent to 1¼ hours per beast per week. In arriving at the hourly rate of wage, allowance has been made for week-end and other overtime, and after making other allowances the cost per hour averaged 2/-. As between herds, labour costs varied from 1/9d per head per week to 4/6d, and from 12/- to £3 per cwt of gain. Thus although on the average labour costs only account for some 3% of total costs (including the value of the store animal) on individual farms labour costs accounted for an appreciably higher proportion of the total cost.

Miscellaneous expenses include rental value of shippons or yards, marketing expenses and other incidentals such as repairs to water bowls, veterinary etc. Altogether these items account for only 1.1% of the total cost, or excluding the value of the store, 3.7% of the total.

Analysis of income

Data relating to the disposal of the 215 cattle included in this investigation are summarised in Table 8.

Table 8. Sales and disposals, 215 cattle

	No	Weight (Net payment)	Total value			Per head			Per Cent
		cwts	£	s	d	£	s	d	%
Cattle sold fat (graded)	205	2366.5	10453	19	2	51	0	0	95.3
Sold as stores or retained	6	66.75	299	1	1	49	16	10	2.9
Casualties	2	24.5	80	17	2	40	8	7	0.9
Deaths	2		2	5	0	1	2	6	0.9
Total	215	2457.75	10836	2	5	50	8	0	100.0

Over 95% of the cattle costed were fattened and graded, while less than 1% died. Six cattle were either sold as stores or were not finished off by the time the main body were marketed. An analysis of the monthly disposals and grading results for all cattle sent to grading centres are given in Tables 9 and 10.

Table 9. Numbers of cattle graded each month

	Dec	Jan	Feb	Mar	Apr	May	June	Total
Numbers	11	46	64	21	62	3	-	207
%	5.3	22.2	31.0	10.1	30.0	1.4	-	100

Marketings were heaviest in Jan, Feb and April. The revised price schedules which came into effect on 1st April were no doubt largely responsible for the holding over of cattle from March to April. The general fodder supply might have been expected to hasten selling, but no doubt the price incentive was a real factor in influencing feeders to hold on to cattle despite the acute fodder position.

Table 10. Analysis of grading

	SS	S	A+	A	A-	B+	B	Ungraded	Unfinished	Deaths	Total
Nos	9	42	55	66	24	8	1	2	6	2	215
%	4.2	19.5	25.6	30.7	11.2	3.7	0.5	0.9	2.8	0.9	100

The average price received per head for the 215 cattle was £50 8 0. Included in this average, however, are 2 cattle which died, 2 cattle graded but classed as casualties and paid for on reduced scale, and 6 unfinished animals. The relevant data for (a) all cattle sold and (b) graded cattle are set out below:-

	Graded cattle	All cattle sold
Number	205	213
Average payment weight (cwts)	11.54	11.53
Average price per cwt	88/4	88/2
Average price per head	£51 0 0	£50 17 3

These figures indicate that the non graded cattle were, on average, similar in value to the graded cattle. The effect of the two deaths was to reduce the overall average returns per head by 9/5d. If, however, we are considering cost without reference to returns, then the effect of these two deaths would be to increase the overall average cost per bullock by 10/3d.

Costs, Margins and Returns

The difference between the average returns per head for all cattle costed and the average initial input value (i.e. store value) is the gross margin. It is equivalent to the increase in value of the animals during the fattening period, and represents the amount available to pay for the food, labour and other items of cost and from which the profit must come.

The data for this group of 24 enterprises is summarised in Table 11.

Table 11. Costs, Returns and Margins per beast fed

	All cattle			Graded cattle		
	£	s	d	£	s	d
Average value of finished animal	50	8	0	51	0	0
" " " store "	39	2	0	39	2	7
Gross margin	11	6	0	11	17	5
Cost of food, labour, etc	15	7	3	15	7	3
Net margin per head (Loss)	4	1	3	3	9	10

As would be expected there is a slightly higher gross margin for graded cattle than for all cattle, £11 17 5 per animal compared with £11 6 0. In both instances this gross margin falls short of the direct costs. The average loss per beast over all farms included in this investigation was £4 1 3. Even if we exclude deaths, casualties and unfinished animals, there is an average loss of £3 9 10. Costs and margins per animal per week and per cwt live weight increase are given in Table 12.

Table 12. Costs and margins per beast per week and per cwt live weight increase. All cattle.

	Per head per week	Per cwt L/W increase
	£ s d	£ s d
Gross margin	16 0	7 9 10
Costs, Foods etc	1 1 9	10 3 8
Net margin (Loss)	5 9	2 14 0

The average loss per animal fed amounted to 5/9d per week. The average loss on each cwt of beef produced amounted to £2 14 0. Costs, returns and margins varied widely as between farms. Of the 24 enterprises included in this study 5 only returned a profit. These ranged from 14/1d to £5 15 0 per animal, or 11/3d to £2 12 0 per cwt increase. Losses ranged from £1 2 4 to £17 3 6 per animal, but were found to be most commonly in the range from £2 - £10 per animal, or £1 - £6 per cwt increase. The two most important factors which determine the amount of profit or loss, and therefore the success or otherwise of winter cattle feeding enterprises are (1) the gross feeders margin, and (2) the level of food cost.

Table 13. Range in Gross Feeders margin per head. (Final value less store value).

Margin	£6-£8	£8-£10	£10-£12	£12-£14	£14-£16	£16-£18	£18-£20	Total
No of farms	3	7	4	3	3	3	1	24

Table 14. Range in net margins per head

Net Margin	Profit			Loss								Total
	£4-£6	£2-£4	£0-£2	£0-£2	£2-£4	£4-£6	£6-£8	£8-£10	£10-£12	£12-£14	£14-£16	£16-£18	
No of farms	1	2	2	1	6	1	5	3	-	2	-	1	24

High feeders margins result from selling cattle of high quality grade and at a period of high prices in relation to the price of the store animal. Thus, if a farmer buys at a low price and sells at a high price his gross margin will be correspondingly high, and he will be able to afford to incur higher costs. On the other hand a profit may be secured on a relatively low feeders margin if sufficient economy in feeding can be effected either by shortening the indoor hand feeding period or by using cheap and efficient feeding practices.

Thus, of the 5 farms in this sample which returned a profit, three show a feeders margin higher than the average, while all 5 show food costs per head, and per cwt live weight increase, which are lower than the average for all enterprises. One of the profitable enterprises combined a low feeders margin with a low food cost. The biggest loss was the result of a high food cost, since the feeders margin for this enterprise was above the average. The high food cost was partly the result of much longer than average feeding period and rather heavy feeding.

In two or three instances, low costs were associated with losses. The loss in such instances, was generally associated with a low feeders margin.

IV. SOME GENERAL CONCLUSIONS

These results are in keeping with the experience of other investigations into the economics of winter fed cattle undertaken in different parts of the country in recent years. There would appear to be little doubt that, considered as a separate enterprise, the business of fattening cattle in yards or shippons in the winter months is, in itself, an unprofitable undertaking, and not only for the large arable farmers of the North and Eastern counties who have frequently to draw their store cattle supplies from long distances, but also to farmers in the stock rearing districts of the West who rear the stores they fatten or buy them from a neighbour.

In interpreting the financial results of a single enterprise, which is an integral part of a mixed farming system, care must be taken since accounting expediences may mask the true position of the enterprise in the economy of the farm as a whole. The activities of the large arable farmers in Yorkshire or Norfolk who would appear to lose money deliberately by buying store cattle and fattening them in yards can be justified, as has already been indicated, by interpreting the accountants figures in terms of enhanced fertility and higher crop revenues. In deciding, therefore, whether the business of fattening cattle at a loss is sound policy or not, every aspect of the system of farming with which it is associated must be understood.

Compared to the large arable farms which have a low ratio of livestock to tillage, and a relatively high proportion of the farm devoted to the production of cash crops with the consequent accompanying high demands on soil fertility, particularly organic manures, West Country farming is predominately based on a livestock economy, and this is equally true of the more predominately arable areas of the South West. Now despite these wide differences in the organisation and requirements of these two systems of farming the immediate financial position which arises from winter fattening of cattle corresponds very closely. In both systems the margin between the price of store cattle and fat cattle is not great enough to cover the cost of the food and labour requirements. Whether the beef cattle prices are too low relative to the price of store cattle or store cattle prices are too high relative to the price of beef cattle is irrelevant to the present discussion. The relevant positions are (1) with present price levels for fat and store cattle, winter fattening is in the main unprofitable and (2) despite

this immediate cash loss a fairly convincing case can be advanced to justify the continuance of the practice on the large arable farms specialising largely in the production and sale of cash crops.

Whether the same criteria can be applied to the group of farms to which this report refers and to others in the South West undertaking similar practices is doubtful. Only one years figures are available, the number of farms studied is small and all the information is not complete. Thus the quantity and quality of dung produced is not known and there is no precise knowledge on the extent of cash cropping. Some potatoes were grown on all farms, while sugar beet and broccoli were included in the cropping of a small proportion of the farms, but in general the production of cash crops is not of primary importance in the economy of these farms. Generally they are devoted to the rearing of cattle and sheep, while a high proportion of the cattle are fed out off grass in the Summer.

What, then, are the considerations which should guide those who are now losing money in winter fed cattle in determining their future policy?

In the first place it is very unlikely that the practice of winter fattening of cattle is the most economic method of producing dung. In fact sufficient dung to satisfy the requirements of all cash crops on these farms should be available from other types of livestock. Also, alternative methods of maintaining fertility present themselves to farmers in the South West. Already considerable attention is being given to the possibilities of improved grassland management, ley farming where the conditions are suitable, direct grassland improvement elsewhere. More grass means more stock and more stock means more "muck". Also the improved grassland should make it possible to fatten out cattle during the summer which would otherwise need finishing off indoors in the winter months. The use of nitrogenous manure particularly in conjunction with young leys will lengthen the grazing season by 6 weeks. partly in the autumn and partly in the spring. A good ley is probably one of the best means of supplying fertilizer to cash crops such as broccoli. In the South West there exists the most favourable climatic conditions for the production and utilization of grass.

Again, those summer graziers who find themselves with unfinished cattle at the end of the grazing period have the alternative, adopted by an increasing number of farmers, of keeping the cattle through the winter in good store condition and finishing on the grass the following spring, while the more arable types of farms have the alternative of growing cash crops in place of forage crops. In fact since the relative price levels of winter milk and winter beef cattle, under the present pricing system, is weighted in favour of milk, then the conversion of hay, roots and corn into milk rather than beef places a higher value on these products when used in the production of milk rather than in the production of beef. If it is impracticable in the light of national priorities to raise winter beef prices relative to winter milk prices, then some transference of these products to dairy farmers would seem to be desirable. In other words it would pay present beef producers better to sell to the dairy farms that portion of their home produced forage crops which they now feed to beef cattle.

Probably the best judge of the situation is the farmer himself. It is indicative of the position that a number of the farmers who participated in this investigation were convinced that they could no longer afford to grow root crops and corn specifically to convert into beef in the winter months. But custom dies hard and it is doubtful if each and everyone of those who announced that this was the last attempt to produce winter beef will not be found with a bunch of "bullocks" in their shippons next winter. The innate pride of the farmer in a good bunch of feeding cattle is not altogether a matter of economics.

Aoknowledgement.

In conclusion the writer takes this opportunity to thank the farmers who so willingly co-operated with him in supplying the data without which this report could not have been prepared. Farming conditions vary from year to year and it is intended to repeat this investigation in the winter of 1947/48 in order to fill in some of the missing gaps in the information, and also to confirm the main ~~feeding~~ findings as set out in this report.