



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

*Cattle - Feeding*

CONFIDENTIAL

Not for Publication

THE WEST OF SCOTLAND AGRICULTURAL COLLEGE,

*Econ. Dept.*

GIANNINI FOUNDATION OF  
AGRICULTURAL ECONOMICS  
LIBRARY

WITHDRAWN  
DEC 4 1974

THE WINTER FATTENING OF BEEF CATTLE

THREE-YEAR REPORT

WINTERS 1970-71, 1971-72 and 1972-73

by

J. F. MACPHERSON

and

NORMAN DAY

MAY, 1974

Economics Report No. 148  
(Limited Circulation)

## CONTENTS

	<u>Page</u>
SUMMARY	1
INTRODUCTION	2
SECTION 1 <u>THE SAMPLE</u>	
The Three-Year Period	3
Distribution by Area and by County	4
Breeds and Crosses	5
Steers and Heifers	5
Sales and Turnout to Grass	6
SECTION 2 <u>OUTPUT, VARIABLE COSTS AND GROSS MARGIN</u>	
Output	7
Variable Costs	8
Gross Margin	9
SECTION 3 <u>GROUPING BY TYPE OF RATION</u>	
Mainly Cereals	11
Silage Group and Roots and Hay Group	12
Estimated Forage Acres per Head	14
SECTION 4 <u>RELATION OF LIVEWEIGHT GAIN TO DIET</u>	
Starch Equivalent	15
Protein	16
Ration Composition - Conserved Grass Products	17
Discussion	18
SECTION 5 <u>LABOUR AND CAPITAL INVESTMENT</u>	
Labour and Tractor Hours	19
Buildings and Equipment	19
SECTION 6 <u>DEFINITIONS AND METHOD</u>	21

#### ACKNOWLEDGEMENT

Grateful acknowledgement is made of the co-operation received from farmers and farm managers who not only kept feed records and notes of purchases and sales but also made their cattle available for weighing. Thanks are also due to colleagues who helped with the cattle weighings and shared in the work of this investigation.

SUMMARY

1. This report gives some average results from a three-year study into the winter fattening of cattle. The numbers recorded were 1216 in 1970-71, 948 in 1971-72 and 1795 in 1972-73.
2. Average results per head are summarised below:-

	1970-71	1971-72	1972-73
No. of batches	33	25	31
No. of cattle	1216	948	1795
% sold fat	74	73	76
£ per head			
Sale Price* (incl. any subsidy)	95	105	163
<u>Less</u> Purchase Price <sup>+</sup>	62	76	113
Cattle Output	33	29	50
<u>Less</u> Variable Costs	23	18	21
Gross Margin	10	11	29

\*incl. value of animals turned out.

<sup>+</sup>incl. value of home-reared animals.

3. The most commonly occurring breeds and crosses in the sample were Herefords, Friesians and Aberdeen Anguses.
4. Animals fed on silage had a slightly better average daily live-weight gain compared with those fed on hay-based rations but there was little to choose between their average gross margins. The few cereal-fed batches had somewhat higher average daily liveweight gains but with one exception low gross margins.
5. The higher gross margins in the third year were due to the wider margins between buying and selling prices in that year.
6. The frequent observation of the unnecessary use of supplementary protein suggests that this is an area in which economies could be made.
7. Since the end of this investigation the position has changed completely. Prices of fat cattle have moved back while grain and concentrate feed prices have more than doubled.



## INTRODUCTION

This report summarises the results of a three-year investigation into the fattening of cattle on farms in the West College province during the winters of 1970-71, 1971-72 and 1972-73

The farms were chosen by the Area Advisers as part of a wider study covering different aspects of beef production in the west of Scotland. The Advisory and Development Service was responsible for the field work. The Economics Division and the Animal Husbandry Department analysed the data.

Cattle weighings were carried out during each of the three winters. Where a farmer already possessed weighing facilities, these were used. In other cases a mobile weighcrush manned by College technical staff was taken to farms as required. Section 4 of the report relating performance to feed intake (starch equivalent and digestible crude protein) is based on recorded weights between dates early and late in the season. For those parts of the report giving an economic assessment of the results, where it was not always possible to obtain actual weights at the start or finish of accounting periods, estimates of liveweight were made. Also it was the weight upon which payment was made at sale time that has been taken rather than the final actual weighings on the farm. There was some loss in weight of the cattle from the time of leaving the farm to passing over the market weigh-bridge where payment in any case is made to the last quarter cwt. shown on the scale.

There was a considerable range in individual results. The cattle were managed under various kinds of systems and conditions and were of different breeds and crosses, weights and quality. Also there were variations in the average period of time for which batches were kept.

The farms in the sample were not identical over the three-year period. The intention at the start was to have equal numbers of farms from each of the five College Areas but as the investigation continued an increasing proportion of the sample was drawn from the Central and Southern Areas regions where some farms are perhaps more traditionally associated with the finishing of cattle.

Throughout the three-year period covered by this investigation the prices of stock kept rising. Towards the end of 1972 there was a steep increase in fatstock prices, which helped to make the third year a profitable one in spite of the higher costs of stores and suckled calves and in spite of rising feed prices.

Grain prices fell in 1971-72 but in 1972-73 they rose again. Since the end of the investigation in the spring of 1973 there has been a complete change and grain and feed prices are now on a higher plane altogether.

SECTION 1

THE SAMPLE

The farms in the sample were not identical over the three-year period. Table I shows that of the 20 original farms 10 continued into the second year and six into the third year. In 1971-72 six new farms were introduced and two of these continued into the third year when an additional 18 farms were brought in. In all, therefore, 44 different farms were visited during the three-year period.

TABLE I

Composition of the sample over the three-year period

	1970-71	1971-72	1972-73
Original Farms	20	10	6
Introduced 1971-72	-	6	2
Introduced 1972-73	-	-	18
Total	20	16	26

The sample was not a random one. The farms were chosen by the Area Advisers and the records deal with 33 batches of cattle on 20 farms in 1970-71, 25 batches on 16 farms in 1971-72 and 31 batches on 26 farms in 1972-73.

Distribution by area and by county

Table II shows the geographical distribution of the batches recorded in the sample.

TABLE II

Distribution by area and by county

Area	County	No. of Batches		
		1970-71	1971-72	1972-73
Argyll	Argyll	5	1	-
Central	Clackmannan	4	1	1
	Stirling	-	2	5
	West Perth	1	2	3
Clyde	Dunbarton	-	-	2
	Lanark	5	1	2
	Renfrew	2	8	2
Southern	Dumfries	6	2	7
	Kirkcudbright	3	2	2
South-Western	Ayr	5	4	5
	Wigtown	2	2	2
Total	Total	33	25	31



Breeds and crosses

Table III summarises the breeds and crosses. Herefords were the most popular breed and together with Friesians and Aberdeen Angus they accounted for 90% of the sample in the first year, 80% in the second year and 75% in the third year when Shorthorn, Ayrshire and Charolais numbers in the sample increased and the Simmental breed made its appearance.

TABLE III

Classification of breeds and crosses

Breed or Cross	1970-71	1971-72	1972-73
Aberdeen Angus	171	147	307
Ayrshire	10	1	79
Blue Grey	15	40	37
Charolais	2	2	42
Devon	46	55	37
Friesian	267	169	417
Galloway	28	12	29
Hereford	670	447	632
Lincoln Red	-	49	69
Simmental	-	-	20
Shorthorn	7	26	126
	1216	948	1795

The numbers of steers and heifers are shown in Table IV.

TABLE IV

Steers and heifers

Type	1970-71	1971-72	1972-73
Steers	858	634	1470
Heifers	358	314	325
	1216	948	1795

In the first and second year steers made up about two-thirds of the sample and four-fifths in the final year.

In Table V it will be seen that three-quarters of the cattle were sold fat. The ratio of liveweight to deadweight sales was about two to one.

TABLE V

Analysis of disposal of cattle

Type	1970-71			1971-72			1972-73		
			%			%			%
Sold fat - liveweight. deadweight	589			470			951		
	<u>308</u>	897	74	<u>226</u>	696	73	<u>408</u>	1359	76
Sold store		23	2		81	9		129	7
Turned out to grass		244	20		155	16		299	17
Transferred out earlier		52	4		15	2		6	-
Died		*	-		1	-		2	-
Total		1216	100		948	100		1795	100

\*A casualty included with deadweight sales.

Where cattle were sold by deadweight, the estimated liveweight at time of sale had to be calculated on the basis of a killing out percentage. Alternatively, where possible, the final weighing on the farm was used if this was close enough to the time of sale.

SECTION 2

OUTPUT, VARIABLE COSTS AND GROSS MARGIN

Output

Table VI gives a summary of the average cattle output.

TABLE VI

Average output per head

	1970-71	1971-72	1972-73
No. of batches	33	25	31
No. of cattle	1216	948	1795
Average time kept (days)	130	141	133
<u>Average Results</u>	£ per head		
Sale Price* (incl. any subsidy)	95	105	163
<u>Less</u> Purchase Price+	62	76	113
Cattle Output	33	29	50

\*incl. value of animals turned out  
+incl. value of home-reared animals.

Cattle output depends largely on the liveweight gain and the price or value per live cwt. Figures from individual results brought out the importance of the feeder's margin - the difference between the buying price (or incoming value of home-reared animals) and the selling price. In the third year margins were significantly higher, due mainly to the rise in the price of cattle that took place between early autumn and mid winter.

Table VII summarises the average liveweight per head and the value or price when calculated per live cwt.

TABLE VII

Average liveweight per head and price or value per live cwt.

	1970-71		1971-72		1972-73	
	cwt. per head	£ per cwt.	cwt. per head	£ per cwt.	cwt. per head	£ per cwt.
At sale or turn out	7.76	12.29	8.01	13.17	8.72	18.73
At yarding	6.16	10.09	6.35	12.04	7.32	15.52
Gain	1.60	2.20	1.66	1.13	1.40	3.21

The ranges in batch average buying-in prices per live cwt. (or value per live cwt. for home-reared animals) were from £8.68 to £11.99 in 1970-71, from £10.62 to £13.29 in 1971-72 and from £13.06 to £18.11 in 1972-73. The batch average selling prices, per live cwt. (or value per live cwt. at turn out) ranged from £10.43 to £13.46 in 1970-71, from £12.28 to £14.18 in 1971-72 and from £16.31 to £20.43 in 1972-73.

Variable costs

Table VIII shows the average variable costs per head made up principally of feed costs which varied according to the length of the feeding period and type and quantity of feed and ranged from £12 to £39 per head in 1970-71, from £9 to £25 in 1971-72 and from £8 to £32 in 1972-73. Purchased feeds were charged at prices paid and home-grown grain and straw were charged at market value (lower in the second year when grain prices fell). Home-grown forage crops (hay, silage, turnips etc.) were charged at variable costs only.

TABLE VIII.

Average variable costs per head

	1970-71	1971-72	1972-73
<u>Variable Costs</u>	£ per head		
Conc. and Grain	14	11	14
Roots and Fodders	6	5	5
Total Feed	20	16	19
Miscellaneous	3	2	2
Total Variable Costs	23	18	21

Miscellaneous costs included bedding straw, vet. and medicines and hired transport.

Gross margin

The financial results in this investigation have been taken to the gross margin stage i.e. output less variable costs. Fixed costs such as labour, depreciation and share of other overheads have still to be charged against the gross margins shown in Table IX below.

TABLE IX

Average gross margin per head

	1970-71	1971-72	1972-73
<u>Average Results</u>	£ per head		
Cattle Output	33	29	50
<u>Less</u> Variable Costs	23	18	21
Gross Margin	10	11	29

There was a wide range in gross margins from (-) £8 to £24 in 1970-71, from £2 to £22 in 1971-72 and from £8 to £50 in 1972-73. Table X shows the distribution.

TABLE X

Distribution according to average gross margin per head

	1970-71	1971-72	1972-73
<u>Gross Margin</u>	<u>Number of Batches</u>		
£50 - £45	-	-	3
£45 - £40	-	-	4
£40 - £35	-	-	1
£35 - £30	-	-	5
£30 - £25	-	-	5
£25 - £20	5	3	6
£20 - £15	4	-	4
£15 - £10	9	12	-
£10 - £ 5	4	6	3
£ 5 - £ 0	5	4	-
<u>Deficit</u>			
£ 0 - £ .5	5	-	-
Over £ 5	1	-	-
<b>Total</b>	<b>33</b>	<b>25</b>	<b>31</b>

SECTION 3

GROUPING BY TYPE OF RATION

The types of rations fed could be classified under the broad headings of mainly cereal, silage fed and roots and hay. Table XI shows the distribution of the batches according to these categories.

TABLE XI

Distribution according to type of ration

	1970-71	1971-72	1972-73
Cereal	5	1	2
Silage	16	17	16
Roots and Hay	12	7	13
Total No. of Batches	33	25	31

The cereal fed cattle often had higher than average daily liveweight gains but the cost of the rations made this an expensive way of producing beef. The five in the first year averaged a negative gross margin of (-) £1 per head. In the second year the single one had a gross margin of £4 per head. Of the two in the final year, one had a gross margin of £8 per head and the other with a complete self feed ration of moist barley, chopped straw, protein supplement and molasses had a high gross margin of £45 per head, but this was due more to the fact that the selling price per cwt. was more than the buying price per cwt. by £5.80 (the highest price difference in the sample).

As there were so few of the cereal fed type they have been excluded from the analyses in Tables XII and XIII which give some comparisons between the batches fed mainly on silage and those fed on a roots and hay based ration.



TABLE XII

Output and gross margin per head

	1970-71		1971-72		1972-73	
	Silage	Roots & Hay	Silage	Roots & Hay	Silage	Roots & Hay
£ per head						
Sale Price* (incl. any subsidy)	97	95	102	115	160	169
<u>Less</u> Purchase Price†	63	62	72	87	111	119
Cattle Output	34	33	30	28	49	50
<u>Less</u> Variable Costs	20	23	18	17	21	20
Gross Margin	14	10	12	11	28	30

\*incl. value of animals turned out.  
 †incl. value of home-reared animals.

There was little to choose between the silage group and the roots and hay group when measured in terms of gross margin as shown above, but Table XIII **opposite** shows that the silage group had slightly better average daily liveweight gains while the roots and hay group had a somewhat larger margin between the buying and selling price.

It is difficult to account for the declining average daily liveweight gain over the three years. The sample of farms was not identical and few of those giving records in the first year were still in the sample in the final year when a number of new co-operators were canvassed. Possibly in the final year with increased fatstock prices and a larger margin to work on there was not the same need to try to achieve higher liveweight gains. Rising feed prices may have also discouraged attempts at a higher level of nutrition. There is also the matter of the quality of the forage and some discussion of this is made in Section 4 which deals with liveweight gain in relation to diet.

TABLE XIII

Liveweight per head and price or value per live cwt.

	1970-71				1971-72				1972-73			
	Silage		Roots & Hay		Silage		Roots & Hay		Silage		Roots & Hay	
No. of batches	16		12		17		7		16		13	
No. of cattle	586		546		656		273		1179		536	
Average time kept (days)	124		128		147		132		144		127	
Average daily l.wt. gain (lb.)	1.43		1.31		1.33		1.26		1.23		1.03	
Average weights per head	cwt.	£	cwt.	£	cwt.	£	cwt.	£	cwt.	£	cwt.	£
<u>Average values per cwt.</u>	per head	per cwt.	per head	per cwt.	per head	per cwt.	per head	per cwt.	per head	per cwt.	per head	per cwt.
At sale or turn out	7.85	12.33	7.79	12.25	7.70	13.25	8.77	13.06	8.55	18.71	8.94	18.86
At yarding	6.25	10.06	6.29	9.88	5.96	12.13	7.28	11.93	6.96	15.90	7.76	15.30
Gain	1.60	2.27	1.50	2.37	1.74	1.12	1.49	1.13	1.59	2.81	1.18	3.56

Estimated forage acres per head

If the cereal fed batches are excluded as they used very little home-grown forage, the remaining batches required from about one quarter to one third of an acre to supply the necessary home-grown forage. A comparison of the silage fed and roots and hay groups is given in Table XIV.

TABLE XIV

Estimated forage acres per head

	1970-71		1971-72		1972-73	
	Silage	Roots and Hay	Silage	Roots and Hay	Silage	Roots and Hay
No. of batches	16	12	17	7	16	13
Av. time kept (days)	124	128	147	132	144	127
Av. forage acres per head	0.29	0.27	0.35	0.31	0.35	0.26

In some instances purchases of draff and brock potatoes lessened the reliance on home-grown forage.

Table XV shows the average consumption per head of home-grown forage.

TABLE XV

Average consumption per head of home-grown forage

	1970-71		1971-72		1972-73	
	Silage	Roots and Hay	Silage	Roots and Hay	Silage	Roots and Hay
	cwt.					
Silage*	47.7	-	67.1	-	65.7	1.5
Hay	1.4	9.7	0.4	12.8	0.2	11.1
Roots	0.7	30.2	0.5	20.1	-	12.2

\*incl. haylage in 1970-71 and 1972-73

SECTION 4

RELATION OF LIVEWEIGHT GAIN TO DIET

Where full information was available on both diet and liveweight change, the calculated nutrient intake was related to the performance level. This was possible for 17 units in 1970-71, 15 in 1971-72 and 13 in 1972-73.

Rations were assessed for the provision of starch equivalent and digestible crude protein.

Starch equivalent

The average liveweight of each group of cattle was calculated from the start and finish liveweights and from this the average maintenance requirement was calculated. Efficiency of performance was calculated by dividing the excess starch equivalent above maintenance by daily liveweight gain. (See Tables XVI and XVII,)

TABLE XVI

Frequency distribution of rate of liveweight gain per day

Daily Liveweight Gain (lb.)	Number of Batches									
	1970-71			1971-72				1972-73		
	S	H	T	S	H	C	T	S	H	T
0.49 & under	-	-	-	-	-	-	-	-	-	-
0.50 - 0.99	1	-	1	-	2	-	2	1	-	1
1.00 - 1.49	4	-	4	6	2	-	8	7	2	9
1.50 - 1.99	6	4	10	3	-	-	3	3	-	3
2.00 & over	2	-	2	1	-	1	2	-	-	-
Total	13	4	17	10	4	1	15	11	2	13

S - Silage  
H - Hay  
C - Concentrates  
T - Total

TABLE XVII

Frequency distribution of lb. "Productive" S.E. per lb. liveweight gain

lb. "Productive" S.E./lb. Liveweight Gain	Number of Batches									
	1970-71			1971-72				1972-73		
	S	H	T	S	H	C	T	S	H	T
1.99 and under	5	-	5	1	1	-	2	-	-	-
2.00 - 2.49	1	-	1	1	-	-	1	-	-	-
2.50 - 2.99	1	1	2	5	-	1	6	3	-	3
3.00 - 3.49	3	1	4	3	-	-	3	3	2	5
3.50 - 3.99	-	1	1	-	-	-	-	2	-	2
4.00 - 4.99	1	-	1	-	1	-	1	-	-	-
5.00 - 5.99	1	-	1	-	1	-	1	2	-	2
6.00 and over	1	1	2	-	1	-	1	1	-	1
Total	13	4	17	10	4	1	15	11	2	13

S - Silage  
H - Hay  
C - Concentrates  
T - Total

Using this assessment of feed efficiency, one would expect the majority of results to fall in the band 2-3 lb. S.E. per lb. liveweight gain. As can be seen, many of the results are in fact well outwith this range with several remarkably low figures cropping up in the 1970-71 and 1971-72 crops. The differences in numbers between this report and the 1972 interim report are due to the removal of some batches of animals and to a raising of the estimated maintenance requirement.

The majority of groups had been fed silage-based diets and the numbers of hay or concentrate-fed cattle did not merit separate examination.

Protein

In a preliminary report, the impression had been gained that supplementary protein was often needlessly added to rations for fattening cattle. Accepting an overall allowance of 1.25 lb. D.C.P. as being adequate in most circumstances, Table XVIII indicates that the picture remained essentially the same over the three years considered, only in 1971-72 were there many animals with below the required level of protein.

TABLE XVIII

Frequency distribution of lb. digestible crude protein

D.C.P. lb. per day	Number of Batches									
	1970-71			1971-72				1972-73		
	S	H	T	S	H	C	T	S	H	T
Under 1.20	1	1	2	1	3	-	4	1	-	1
1.20 - 1.30	1	-	1	-	-	-	-	2	1	3
Over 1.30	11	3	14	9	1	1	11	8	1	9
Total	13	4	17	10	4	1	15	11	2	13

S - Silage  
H - Hay  
C - Concentrates  
T - Total

Ration composition - conserved grass products

The quality of conserved grass products is known to have a marked effect upon animal performance in many situations. To check the effect within the sample, correlation coefficients were calculated between daily liveweight gain and silage (in terms of starch equivalent in the fresh material). In no year was a significant correlation found between this assessment of silage quality and daily liveweight gain. It is possible that an examination of the digestibility of the conserved grass might have proved more fruitful.

A further confounding feature was the variation from farm to farm in the importance of conserved grass in the diet. This was calculated as the percentage of the total starch equivalent which was provided by hay or silage. Table XIX overleaf shows the frequency distribution of this assessment.

TABLE XIX

Contribution of conserved grass to diet (S.E.)

Percentage Conserved Grass in Diet	Number of Batches									
	1970-71			1971-72				1972-73		
	S	H	T	S	H	C	T	S	H	T
20 and under	2	-	2	-	-	1	1	-	-	-
20 - 29	3	3	6	-	-	-	-	-	1	1
30 - 39	3	1	4	2	2	-	4	3	-	3
40 - 49	2	-	2	2	-	-	2	3	-	3
50 - 59	1	-	1	6	1	-	7	5	-	5
60 - 69	2	-	2	-	1	-	1	-	1	1
70 and over	-	-	-	-	-	-	-	-	-	-
Total	13	4	17	10	4	1	15	11	2	13

S - Silage  
H - Hay  
C - Concentrates  
T - Total

It was felt that the proportion of grass products in the ration might also have a bearing on the efficiency of energy conversion. To this end correlation coefficients were calculated between "production" starch equivalent per lb. liveweight gain and per cent. starch equivalent from conserved grass. Again, no significance could be detected and seasonal differences were extreme.

Discussion

Data were examined for correlations between a variety of physical parameters. Efforts to relate performance to dietary energy and roughage quality were unsuccessful although a correlation at a low, non-significant level was observed between roughage quality and daily liveweight gain. No relationship was found between daily liveweight gain and daily digestible crude protein allowance.

Recorded levels of performance were on the whole lower than expected. Part of this may have been due to the timing of weighings, e.g. on farm or market weighings, and an overriding problem to the whole study of on farm physical records is in the standardising of conditions. Included in this category must be considerations of animal type, age and condition as well as the numerous variations in management practice and ability from farm to farm.



SECTION 5

LABOUR AND CAPITAL INVESTMENT

These items which fall outwith the gross margin calculations are briefly summarised in this section.

Labour and tractor hours

The time spent on attending to the cattle is shown in Table XX below. Averages are expressed per head.

TABLE XX

Labour and tractor average hours per head of cattle

	1970-71	1971-72	1972-73
No. of batches	33	25	31
Labour (hours)	5.4	5.7	3.5
Tractor (hours)	1.2	1.4	0.8

Buildings and equipment

Existing buildings were used on eight of the original 20 farms, on one of the six farms introduced in the second year and on seven of the 18 farms introduced in the third year. Thus of the 44 farms visited during the three years 16 required no capital expenditure as the cattle were kept in existing buildings.

On the remaining 28 farms capital expenditure varied considerably. At one end of the scale courts were built with farm labour using second hand trusses and cladding. At the other end were completely new units - mainly large buildings, some with self-feed silage others with central feeding passages, some with concrete floors and others with slats high or low level. With a share of ancillary buildings and equipment for feed storage etc., some costs were between £60 and £90 net of any grant.

TABLE XXI

Estimated capital per head for buildings and equipment

Estimated Capital per Head	No. of Farms
None	16
Up to £20	11
£20 - £40	7
£40 - £60	7
£60 and over	3
	44

SECTION 6

DEFINITIONS AND METHOD

The results are presented on a gross margin basis. Gross margin may be defined as the difference between cattle output and the variable costs involved.

Cattle output is the value of cattle sold (net of commission etc. but including any deficiency payments), transfers out and cattle turned out to grass at the end, less the value of cattle purchased, transfers in and cattle on hand at the beginning (including the value of any home reared animals).

Variable costs comprise feed costs (purchased and home-grown) and miscellaneous costs such as bedding, vet. and medicines, transport and sundries.

Purchased feeds both concentrates and grain and others such as draff and stock feed potatoes have been charged at actual prices paid.

Home-grown cereals and straw have been charged at estimated market value as follows:-

	1970-71	1971-72	1972-73
	£ per ton		
Moist grain	25.00	21.00	25.00
Barley	28.00	23.00	28.00
Oats	28.00	19.00	28.00
Straw	6.00	4.00	4.00

To conform to the standard gross margin analysis home-grown forage crops have been charged at their estimated variable cost only i.e. the costs directly incurred in the growing of the crop - mainly fertilisers, seed, sprays, twine and any casual/contract work. As it was not practicable to gather these costs for individual farms, the following estimated standard variable costs have been used for home-grown forage crops.

	£ per ton
Turnips and Swedes	1.50
Kale	1.50
Silage	1.50
Hay	3.50
Haylage	2.50

Home-grown stock feed potatoes have been charged at £5.25 per ton. Unweighted averages have been used throughout the report.