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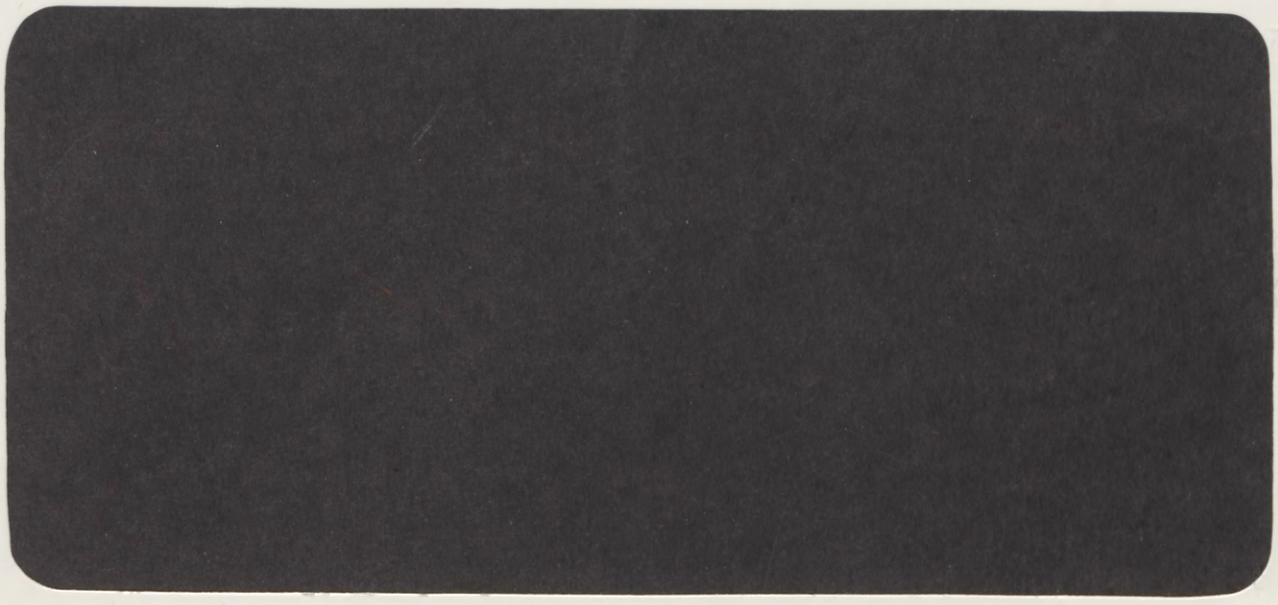

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AGRICULTURAL ENTERPRISE STUDIES IN ENGLAND AND WALES

ECONOMIC REPORT No. 58

HILL AND UPLAND FARMING IN WALES

An Economic Study for 1973-74 and 1974-75

by

A. Lloyd B.Sc., and W. Dyfri Jones M.Sc.

DEPARTMENT OF AGRICULTURAL ECONOMICS

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AGRICULTURAL ENTERPRISE STUDIES IN ENGLAND AND WALES

University Departments of Agricultural Economics in England and Wales have for many years undertaken economic studies of crop and livestock enterprises, receiving financial and technical support from the Ministry of Agriculture, Fisheries and Food.

The departments in different regions of the country conduct joint studies of those enterprises in which they have a particular interest. This community of interest is recognised by issuing enterprise studies reports, prepared and published by individual departments in a common series entitled "Agricultural Enterprise Studies in England and Wales".

Titles of recent publications in this series and the addresses of the University Departments are given at the end of the report.

PREFACE

The Department of Agricultural Economics, University College of Wales, Aberystwyth, along with corresponding departments in other Universities in England and Wales, carries out a substantial amount of investigational work on behalf of the Ministry of Agriculture, Fisheries and Food. The Farm Management Survey, conducted annually, constitutes an important part of this work; but, in addition, various enterprise studies are conducted from time to time. This report relates to studies of the sheep and cattle enterprises on hill and upland farms and, to save time and money, has been based on data obtainable from the Farm Management Survey, supplemented to some extent by certain additional data obtained from the relevant F.M.S. farms.

Four Universities have cooperated in the collection of data, namely Newcastle, Aberystwyth, Manchester and Leeds. This report is concerned with the economic aspects of sheep and cattle production in Wales only and relates to the years 1973-74, 1974-75 and 1975-76. The Department is most grateful for the willing assistance of the cooperating farmers.

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CHAPTER 1

Introduction

Classification of farms

Hills and uplands, encompassing land of varying quality, occupy a large proportion of the agricultural area of the Principality. They include not only the rough grazings which account for about 37 per cent of the 1.71 million hectares of the agricultural land of Wales (Table 1) but also an almost equal area of crops and grass. More than half of the agricultural area of Wales, which would include all the hill and upland areas, qualifies for special financial and other support authorized by the EEC Directive in Less Favoured Areas.

Farms in our Farm Management Survey sample have been subdivided into hill and upland categories according to certain criteria which, because of certain underlying physical and climatic differences, differ in some respects from those used in a similar survey for the North of England. For the Welsh sample the criteria satisfied by farms placed in the 'hill' category were:-

(1) Over 75 per cent of the ewe flock must qualify for the supplementary (as well as the basic, of course) rate of hill sheep subsidy.

(2) Rough grazings must account for at least 30 per cent of the total farm area.

Table 1

Total Agricultural Area in Wales
1976

	Total Agricultural Area (excluding all Rough Grazings)			Total Area of Rough Grazings in Sole Occupation			Total Area of Common Rough Grazings			Total Agricultural Area		
	Hectares	(a) %	(b) %	Hectares	%	%	Hectares	%	%	Hectares	%	%
Anglesey	51,504	5.0	88.2	6,143	1.4	10.5	730	0.4	1.3	58,377	3.5	100
Brecon	67,437	6.5	42.0	31,838	7.4	19.8	61,163	33.8	38.2	160,438	9.7	100
Caernarfon	48,706	4.7	38.7	60,197	14.0	47.8	17,001	9.4	13.5	125,904	7.6	100
Cardigan	97,373	9.4	65.8	48,828	11.4	33.0	1,861	1.0	1.2	148,062	9.0	100
Carmarthen	150,186	14.4	79.6	26,943	6.3	14.3	11,573	6.4	6.1	188,702	11.5	100
Denbigh	99,519	9.6	67.8	30,146	7.0	20.5	17,174	9.5	11.7	146,839	8.9	100
Flint	44,258	4.2	91.6	3,322	0.8	6.9	722	0.4	1.5	48,302	2.9	100
Glamorgan	74,876	7.2	60.9	32,180	7.5	26.2	15,964	8.8	12.9	123,020	7.5	100
Merioneth	38,186	3.7	29.7	79,701	18.5	62.0	10,750	5.9	8.3	128,637	7.8	100
Monmouth	78,621	7.6	81.8	7,271	1.7	7.6	10,217	5.6	10.6	96,109	5.8	100
Montgomery	109,724	10.5	61.1	63,812	14.8	35.5	6,009	3.3	3.4	179,545	10.9	100
Pembroke	112,397	10.8	83.0	15,744	3.7	11.6	7,343	4.1	5.4	135,484	8.2	100
Radnor	66,963	6.4	60.2	23,571	5.5	21.2	20,647	11.4	18.6	111,181	6.7	100
WALES	1,039,750	100	63.0	429,696	100	26.0	181,154	100	11.0	1,650,600	100	100

Source: Digest of Welsh Agricultural Statistics
(a) % of corresponding area for Wales
(b) % of total agricultural area of county

(3) At least 45 per cent of the enterprise output of the farm must be derived from the sheep enterprise.

Any livestock rearing farms in our sample which were situated in the Less Favoured Area, and which did not meet with all the above requirements, were placed in the upland category.

The corresponding criteria used by the Department of Agricultural Economics, University of Newcastle, for distinguishing between hill and upland farms, were as follows, farms having to satisfy three of the four criteria to be classified as hill farms.

(1) the whole flock must be in receipt of the supplementary rate of the hill sheep subsidy.

(2) the ratio of rough and fell grazings to inbye land must be at least 5:1.

(3) the sheep enterprise must contribute at least 50 per cent to the total farm enterprise output.

(4) the density of stocking must be not less than 5 acres per grazing livestock unit.

The Ministry of Agriculture's classification of farms into various types are based solely on standard-man-day requirements. Hence they classify livestock rearing and fattening farms into three categories (Table 2):-

(i) mostly cattle

(ii) mostly sheep

(iii) cattle and sheep

To qualify for these three categories at least 50 per cent of the standard man days must be tied up in livestock rearing and fattening; and for the specialist categories,'mainly sheep' or 'mainly cattle', 75 per cent or more of the total standard man days for the farm have to be devoted to the particular enterprise(s) i.e. to cattle or to sheep. If less than 75 per cent of the total standard man days are devoted to each, the cattle and sheep enterprises, the farms fall into the 'cattle and sheep' type.

Table 2 shows that most of the full-time rearing and fattening farms in Wales fall within the 'cattle and sheep' category, one which includes a very large proportion of 'upland' farms, along with many lowland farms.

It is of interest to note the very large number of holdings - no less than 47 per cent of all holdings in Wales - with less than 275 standard man days. Unfortunately these have not been further classified by type of farming.

Table 2

A Distribution of Holdings in Wales by Type and (SMD) Size
June 1973

Type of Farming \ smd size group	275-299 smd		600-1199 smd		1200 smd & over		All holdings	
Holdings with 275 smd or more	No.	%	No.	%	No.	%	No.	%
Specialist Dairy	2816	31	1719	28	434	24	4969	29
Mainly Dairy	1483	16	1042	17	311	17	2836	17
Livestock Rearing and Fattening: mostly cattle	618	7	219	4	49	3	886	5
Livestock Rearing and Fattening: mostly sheep	975	11	707	11	238	13	1920	11
Livestock Rearing and Fattening: cattle & sheep	2532	28	1823	30	448	25	4803	28
Others	718	7	598	10	333	18	1649	9
Total	9142	100	6108	100	1813	100	17063	100
Holdings with less than 275 smd	-		-		-		15432	
All Holdings	9142		6108		1813		32495	

Source: Digest of Welsh Agricultural Statistics

Most of the farms receiving financial assistance from the government, in the form of hill subsidies and special grant aid on works and improvements, are found in the mostly sheep, and cattle and sheep groups mentioned above.

Livestock Numbers

Turning now to the numbers of animals involved in hill and upland farming in Wales, an indication of these is given by the numbers of cattle and sheep in receipt of the hill cow and hill sheep subsidy. Together, these form the basis of the breeding and rearing enterprises from which hill and upland farmers make a living.

Table 3 shows the numbers of cows for which hill cow subsidy was claimed, number of paid applications, along with the number of cows per holding and the relative significance of hill cows amongst the total beef breeding population. Out of a total of just over 230,000 beef cows and heifers in Wales in 1973, 64 per cent received the hill cow subsidy. In this respect, the most important 'counties' numerically were Brecon, Denbigh, Merioneth, Montgomery and Radnor, all of which had very high percentages of hill cows within their total beef cow herds. In fact, nearly 70 per cent of all hill cows in Wales are located in these five counties.

These particular 'counties' also figured very prominently in respect of the number of ewes qualifying for hill sheep subsidy in 1973; 68 per cent of all sheep qualifying for this subsidy in Wales, were situated within their boundaries. The proportion of sheep qualifying for the subsidy naturally varies from county to county according to soil, topographical, and climatic conditions. It is not surprising that Merioneth, a very mountainous county with as much as 70 per cent of its agricultural area under rough grazings, had 91 per cent of its sheep in receipt of the subsidy. At the other extreme only a third

Table 3

Number of Cows in Receipt of Hill Cow Subsidy in Wales 1973

County	Total Number of Cows		Cows Per Holding	No. of Paid Applications	Hill Cows as % of Total Beef Type Cows
	No.	%			
Brecon	20993	13.9	21	1091	80
Caernarfon	10613	7.0	15	713	57
Cardigan	10210	6.8	14	746	56
Carmarthen	10583	7.0	14	753	50
Denbigh	15566	10.3	17	920	75
Flint	1114	0.7	10	108	32
Glamorgan	9638	6.4	17	582	59
Merioneth	13325	8.8	16	854	88
Monmouth	3334	2.2	10	346	31
Montgomery	28418	18.9	17	1641	83
Pembroke	1721	1.2	11	156	15
Radnor	25253	16.8	24	1063	89
WALES	150768	100	17	8901	64*

*Total beef type cows includes those in Anglesey

Source: Digest of Welsh Agricultural Statistics in England and Wales.

Table 4

Number of Breeding Ewes in Receipt of Hill Sheep Subsidy in Wales 1973 (Dec 1972 & June 1973)

	Number of Ewes in Receipt of: Supplementary Rate		Basic Rate		Total Hill Ewes		As % of All Breeding Ewes
	No.	%	No.	%	No.	%	%
Brecon	263,911	15.8	82,960	10.9	346,871	14.3	81
Caernarfon	182,549	10.9	16,341	2.2	198,890	8.2	74
Cardigan	163,331	9.8	24,697	3.2	188,028	7.7	70
Carmarthen	132,550	7.9	19,980	2.6	152,530	6.3	67
Denbigh	166,327	9.9	137,366	18.1	303,693	12.5	80
Flint	3,360	0.2	17,398	2.3	20,758	0.8	35
Glamorgan	117,037	7.0	10,232	1.4	127,269	5.2	65
Merioneth	275,630	16.5	30,898	4.1	306,528	12.6	91
Monmouth	46,347	2.7	14,428	1.9	60,775	2.5	38
Montgomery	202,701	12.1	184,474	24.3	387,175	15.9	84
Pembroke	33,168	2.0	4,836	0.6	38,004	1.6	54
Radnor	86,759	5.2	215,524	28.4	302,283	12.4	86
WALES	1,673,670	100	759,134	100	2,432,804	100	74

Source: Digest of Welsh Agricultural Statistics and Agricultural Statistics in England and Wales.

of the relatively few sheep in Flint, only 8 per cent of whose agricultural area is under rough grazings, fell into the same category.

It is apparent that hill and upland farming in Wales together encompass just over half the agricultural area, about three quarters of the number of breeding sheep and two thirds of the beef cows.

Participants in the Survey and Sample

Four University Departments of Agricultural Economics took part in the investigation into hill and upland livestock rearing enterprises in 1973-74, namely those at Newcastle, Leeds, Manchester and Aberystwyth, thereby covering hill and upland areas in the North of England and Wales. Newcastle was responsible for analysing the data for the North of England and, obviously, Aberystwyth that for Wales. In 1974-75 and 1975-76 limited data was collected by Newcastle and Aberystwyth only.

The number of farm records available from Newcastle and Aberystwyth in 1973-74 and 1974-75 were as follows:-

	Hill	Upland	Dairy and Sheep
Newcastle	25	17	11
Aberystwyth	39	19	-

This report is concerned very largely with the data relating to the samples of Welsh hill and upland farms.

CHAPTER 2

Physical Data

Sample Selection

In the initial stages of planning the survey, it was decided to use the Farm Management Survey* as the pool from which to select suitable hill and upland farm records. The reasons for doing this were three-fold:

(1) A list of farms where data collection had already taken place was available. This would eliminate time and expense taken in recruiting.

(2) Reconciliation of the new enterprise accounts and the F.M.S. account would be possible.

(3) Each farm had both beef and sheep enterprises, a fact which would result in the number of farms in the survey being kept to a minimum.

The 58 Welsh farms in the survey for the two years 1973-74 and 1974-75 were drawn from a variety of counties within the Principality. Table 5 shows the distribution of the farms on the basis of the 'old' counties;

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*Each centre is a participant in the Ministry of Agriculture's Farm Management Survey, an annual survey of farm accounts in England and Wales covering some 2600 holdings. Data collection and account completion is carried out, on contract to MAFF, by one Agricultural College and several University Departments of Agricultural Economics.

in this table a certain pattern is apparent, namely, the four counties Caernarfon, Merioneth, Cardigan and Carmarthen have a strong representation of hill farms, which is not surprising since these four counties, along with parts of Denbigh, contain most of the most rugged and exposed land in the Principality. Radnor however, with its rolling hills, is the county that predominates with respect to the upland-type farms. Other counties are also important in this respect but are not as strongly represented in the sample.

It is clear from the table that hill farms are the more strongly represented in this sample although, in reality, they are much less numerous than the upland type. The 39 hill farms represent roughly 2 per cent of the actual number of 'hill' or 'mainly sheep' farms in Wales, whereas the 19 'upland' farms available from the sample represent barely 0.4 per cent of the actual number of this category. Obviously the results for the upland farms cannot be regarded as being in any way conclusive; even so they should be sufficient to bring out broad differences, in farm size, farm organization, and income levels, from those of the hill farms.

Table 5

A Distribution of the Welsh Sample of Hill and Upland Farms by Counties

County	Hill Farms	Upland Farms	All Farms
Brecon	2	2	4
Caernarfon	7	-	7
Cardigan	8	2	10
Carmarthen	6	1	7
Denbigh	3	2	5
Merioneth	10	-	10
Montgomery	1	2	3
Pembroke	2	-	2
Radnor	-	10	10
Total	39	19	58

Land Use and Stocking

Table 6 gives particulars of average farm size and land use for different size groups of the farms concerned. It shows that in terms of actual area of land the hill farms were, on average, over twice as large as the upland farms. The main reason for this was the much greater area of rough grazings associated with the former; this is expected from the higher elevations at which hill farms are situated. On converting the area of rough grazing into its pasture hectare equivalent*, the overall difference between the average farm size (in effective hectares) between the two groups was much smaller.

*This conversion is made by ascertaining the grazing potential of rough grazings in relation to that of inbye grassland, and then reducing their value accordingly, e.g., if it were considered that 4 hectares of rough grazing had the same grazing value as 1 hectare of inbye grazing then 100 hectares of rough grazing would be 25 pasture equivalent hectares, or 25 effective hectares.

For both hill and upland farms there was a very clear positive relationship between the area of rough grazings and the size of farm. This relationship was much more apparent for the hill farms than for the upland, because of the severer physical and climatic conditions under which the former operate. The use made of common grazings was taken into account in arriving at the average total farming area for different size groups of farms. On average, the hill farms made only slightly more use of common grazings than did the upland farms. Whereas it was the largest hill farms which made the most use of these grazings it was the middle size group of the upland farms which made the most use of them. Measured in absolute terms the average area of common rough grazings was small, in both cases, but relative to the area of rough grazing in sole occupation, whereas it was of little significance for the hill farms, it was much more significant for upland farms.

The ratio of the area of total rough grazings (in sole occupation and common) to the area of crops and grass increased with size of hill farm - from 1.25:1 to 3.29:1. However, the largest size group of upland farms had a corresponding ratio of only 0.26:1, less even than it was on the smallest farms.

Generally the proportion of farm land under crops and grass was much greater on the upland farms than on the hill farms and, therefore, the ratio of cattle to sheep was much greater on the former. This is shown clearly by the ratios of cattle to sheep on various sizes of hill and upland farms, included in Table 7. Despite very considerable

Table 6

Land Use on F.M.S. Samples of Welsh Hill and Upland Farms in 1973-74

Size Group (Effective Hectares)	Hill Farms				Upland Farms			
	0-65	66-122	123+	All Farms	0-65	66-122	123+	All Farms
No. of Farms	10	13	16	39	6	8	5	19
Cropping	Hectares				Hectares			
Tillage	2.72	1.95	7.15	4.28	3.75	9.75	22.76	11.28
Temporary Grass	3.75	3.04	10.20	6.16	8.47	6.96	22.36	11.49
Permanent Grass	28.44	38.34	73.42	50.20	20.39	52.73	116.36	59.26
Total Crops and Grass	34.91	43.33	90.77	60.64	32.61	69.44	161.48	82.03
Rough Grazing (Sole Occupation)	33.68	112.78	270.14	157.06	6.99	14.30	25.56	14.95
Total Farm Area (Sole Occupation)	68.59	156.11	360.91	217.70	39.60	83.74	187.04	96.98
Share of Common Grazing	10.13	18.22	28.71	20.45	8.17	27.85	17.01	18.78
Total Rough Grazing (Sole Occupation and Share of Common)	43.81	131.00	298.85	177.51	15.16	42.15	42.57	33.73
Total Farming Area (including share of Common Rough Grazing	78.72	174.33	389.62	238.15	47.77	111.59	204.05	115.76
Hectares of Total Rough Grazing per Hectare of Crops and Grass	1.25	3.02	3.29	2.93	0.46	0.61	0.26	0.41
Effective Hectares of Rough Grazing								
(Sole occupation & share of common)	17.77	50.03	108.47	67.74	5.54	16.47	16.85	13.12
Total Effective Area	52.68	93.36	199.24	126.38	38.15	85.91	178.33	95.15

differences in their average size, the hill being larger than the upland farms, the average number of livestock, measured in livestock units, is surprisingly similar, 85 and 89 units per farm respectively. Because the proportion of rough grazings tends to increase with farm size, the importance of sheep increases as well, the noteable exception again being the group of largest upland farms, in which the proportion of sheep is higher than the ratio of rough grazings to crops and grass would suggest. Another interesting point apparent from Table 7 is the tendency to keep at least some cattle to an older age (over 2 years old) on hill. The ability of older cattle to make better use of rough grazings than young ones makes this sound practice both from an economic standpoint and from the point of view of maintaining the quality of the grazings.

The overall density of stocking, measured on a per actual hectare basis, was twice as much on the upland as on the hill farms but, on a per effective hectare basis, it was barely 50 per cent more. The latter is, of course, a reflection of the adjustments made to the rough grazings in an attempt to equate them, on a quality basis, to the area of crops and grass.

Not unexpectedly the density of stocking declines by farm size. The decline is much more marked for hill than for upland farms, and also when stocking density is assessed on the basis of the actual hectarage rather than the effective hectarage.

Table 7

Stocking Data 1973-74 Per Farm

Size Group (Effective Hectares)	Hill Farms				Upland Farms			
	0-65	66-122	123+	All Farms	0-65	66-122	123+	All Farms
Numbers								
Beef Herd - Bulls	0.6	0.9	1.1	0.9	0.7	0.5	1.3	0.8
- Cows	18.9	19.5	38.3	27.0	20.7	27.1	70.4	36.5
Other Cattle - Heifers in Calf	2.9	2.7	4.5	3.5	1.5	2.7	12.9	5.0
- Over 2 yrs	0.6	0.2	0.8	0.6	0.3	0.3	-	0.2
- 1 - 2 yrs	9.8	9.7	13.0	11.1	12.0	19.7	25.9	18.9
- 0 - 12 mths	19.8	18.0	27.5	22.4	22.4	29.6	53.6	33.6
Total Cattle - in L.U.'s	28.5	27.7	46.8	35.8	30.5	38.0	90.4	49.4
Sheep - Rams	7.3	14.6	25.6	17.2	4.0	6.1	14.1	7.5
- Breeding Ewes (incl. Ewe Lamb Replacements)	238.1	412.0	869.7	555.2	190.6	285.2	768.2	382.5
Total Sheep - in L.U.'s	22.1	36.5	76.8	49.3	19.5	30.6	70.6	37.6
Total Livestock - in L.U.'s	50.6	64.2	123.6	85.1	50.0	73.1	161.0	88.9
Stocking Density - L.U. per Actual Hectare	0.64	0.37	0.32	0.36	1.05	0.66	0.79	0.77
- L.U. per Effective Hectare	0.96	0.69	0.62	0.67	1.31	0.85	0.90	0.93
Cattle L.U. per Sheep L.U.	1.29	0.76	0.61	0.73	1.56	1.24	1.28	1.31

CHAPTER 3

Financial Results

This section examines the sample of the whole farm financial accounts classified again into hill and upland categories, and subdivided by size groups measured in hectares. The data are presented in this order for 1973-74 and 1974-75 but only the averages for 'all farms' data are given for 1975-76. The financial results are shown 'per farm' and 'per effective hectare' in Tables 8, 9, 10 (A and B) and 11 (A and B).

Interesting changes in the prices for farm products and inputs occurred in the three years under review. Whilst the latter increased dramatically over the period, livestock prices plummeted disastrously in 1974-75, and store livestock producers, who make up a large part of the sample farms, were severely hit. The price of store cattle and sheep were extremely depressed in the autumn of 1974, and because hill farmers do not have the facilities to carry over stock until better prices are available, they had to dispose of the year's production at very low prices. This is reflected in Table 8 by the drop in the output of both cattle and sheep, in the former especially, for the hill farms in 1974-75. The figures for the breeding herd show an increase largely because of a second payment of the hill cow subsidy early in 1975; however, the value of 'other beef cattle' fell by no less than 27 per cent. Overall the hill farms suffered a fall in

the value of output of 9 per cent, despite government intervention, as mentioned above, and also as an increase in the rate of hill sheep subsidy.

Between 1973-74 and 1974-75, whilst livestock prices slumped, variable costs increased by 40 per cent and fixed costs by 19 per cent, the ultimate result being a decline in management and investment income of almost 70 per cent along with a very heavy drop in the return on tenant's capital. The vulnerability of hill farming systems to vagaries of the market in this case, but often of the weather, and the difficulties of formal planning and adjusting experienced by their operators, is well illustrated by these figures.

In comparison with the previous year, the situation improved very considerably in 1974-75, but even so the average management and investment income for the sample of hill farms was not restored to the 1973-74 level, and when account is taken of the continued fall in the value of the pound, in real terms there had been a considerable drop in incomes.

Upland farms did not fare quite as badly, the drop in their average management and investment income in 1974-75 being 40 per cent. Although it has risen again in 1975-76, it represented a substantial fall in real terms. (Table 9).

These tables also reflect the almost perennial income problem associated with small hill and upland farms. The average level of net farm income

Table 8

Output, Variable and Fixed Costs, and Net Farm Income, on Welsh Hill Farms in 1973-74, 1974-75 and 1975-76
Per Farm

Size Group (Effective Hectares)	1973-74				1974-75				1975-76
	0-65	66-122	123+	All Farms	0-65	66-122	123+	All Farms	All Farms
No of Farms	10	13	16	39	10	13	16	39	39
Average Size (Effective H'ares)	53	94	199	126	53	93	202	128	128
Enterprise Output	£	£	£	£	£	£	£	£	£
Breeding Herd	1628	1640	3371	2347	1792	1640	3838	2581	2762
Other Beef Cattle	1148	1218	2130	1574	994	802	1529	1150	2432
Sheep & Wool	2912	4240	9261	5959	2532	3767	8360	5334	7256
Other	283	338	440	366	215	212	309	252	493
Total	5971	7436	15202	10246	5533	6421	14036	9317	12943
Costs and Margins									
Variable Costs	963	1606	2013	1608	1458	1942	3010	2256	2911
Gross Margin before Forage	5008	5830	13189	8639	4075	4479	11025	7061	10032
Forage Variable Costs	426	277	514	412	480	348	808	571	758
Gross Margin after Forage	4582	5553	12675	8226	3595	4131	10217	6490	9274
Fixed Costs	3298	3867	5707	4476	3913	4459	6940	5337	6288
Management & Investment Income	1285	1686	6968	3750	-318	-328	3276	1153	2986
Farmer & Wife Manual Labour	1515	1545	1515	1525	1910	1964	1868	1911	2436
Net Farm Income	2800	3231	8484	5276	1591	1637	5145	3064	5422
Return on Tenant's Capital %	18	18	43	33	-4	-4	20	9	NA

Table 9

Output, Variable and Fixed Costs, and Net Farm Income, on Welsh Upland Farms in 1973-74, 1974-75 and 1975-76
Per Farm

Size Group (Effective Hectares)	1973-74				1974-75				1975-76
	0-65	66-122	123+	All Farms	0-65	66-122	123+	All Farms	All Farms
No of Farms	6	8	5	19	6	8	5	19	17
Average Size (Effective H'ares)	38	86	178	95	39	82	176	93	101
Enterprise Output	£	£	£	£	£	£	£	£	£
Breeding Herd	1530	1923	5340	2698	2184	2466	7155	3611	3759
Other Beef Cattle	1474	1915	3752	2259	1673	2469	2191	2144	4067
Sheep & Wool	2810	4715	12784	6237	2899	4392	11886	5893	8542
Other	549	1057	937	865	753	1294	1855	1271	1228
Total	6363	9610	22813	12059	7509	10621	23087	12919	17596
Costs and Margins									
Variable Costs	1585	1934	4354	2461	2526	2637	5045	3235	4198
Gross Margin before Forage	4778	7675	18460	9598	4984	7984	18042	9683	13398
Forage Variable Costs	466	782	1444	856	597	799	1116	818	1143
Gross Margin after Forage	4312	6893	17016	8742	4387	7185	16926	8865	12255
Fixed Costs	3296	5217	8232	5404	4303	6349	10675	6841	8659
Management & Investment Income	1016	1676	8784	3338	83	836	6251	2023	3596
Farmer & Wife Manual Labour	1443	1548	1510	1505	1702	1882	1992	1854	2419
Net Farm Income	2460	3224	10294	4843	1785	2719	8243	3878	6015
Return on Tenant's Capital %	13	14	32	23	1	7	22	13	NA

for those in the group of smallest and even medium sized farms was low in 1973-74, but were even lower in 1974-75; and the drop in return on tenant's capital for these groups was such as to give negative figures for hill farms in the latter year, and very low positive figures for the upland farms.

What ways are there open to these smaller farmers for improving the profitability of their businesses? One of the main problems is a shortage, or a lack, of funds, resulting from low profits, available for reinvestment to bring about expansion and to reap some of the economies enjoyed by their larger counterparts. The payments, by the government, of headage subsidies on cattle and sheep has been, for many years, a most important element in the incomes of hill and upland farmers, the smaller ones in particular. In addition substantial capital grants have been paid for selected types of improvements to land and buildings. In 1974 a new scheme, 'The Farm and Horticulture Development Scheme', originating from our membership of the EEC, was introduced. Its aim is the bringing of farm labour income wherever possible to levels comparable with the average earnings in non-agricultural industry. The scheme involves the drawing up of a development plan for the applicant's farm for anything up to six years, listing all investments due to take place during the life of the scheme. The incentives in this scheme as opposed to the Farm Capital Grants Scheme, now closed to new applicants, are the slightly higher rates of grant paid on investments, and the guidance premium payable to farmers whose activities are primarily concerned with the production of sheep and beef type animals. For two or three years this scheme

attracted little interest because of the difficulties experienced by farmers in preparing development plans and the strict interpretation of the eligibility rules. Some relaxation of the rules has resulted in a flood of applications since the beginning of 1977. The scheme is particularly beneficial to hill and upland farmers since, as producers of cattle and sheep suitable for meat production, they qualify for the guidance premium over a period of three years and, farming in the less favoured areas, they are paid higher rates of grants.

It is becoming evident from the Farm Management Survey that a significant proportion of hill and upland farmers are taking advantage of this scheme, and that it presents real opportunities for raising the profitability of farms in the hills and uplands. There is much concern at present that it is the larger and possibly the more progressive farmers who are making use of the scheme. If this is true and the situation persists then those who need help the most will have lost a golden opportunity to improve their lot, and the income gap between large and small farmers will be widened further.

Reference to Tables I and II in Appendix A will give more details of individual items of cost in the two years 1973-74 and 1974-75. In both groups of farms variable livestock costs accounted for roughly 30 per cent of total inputs, forage variable costs another 8 per cent and the remainder, 62 per cent, was accounted for by fixed costs. The second category, namely forage variable costs, consists of the cost of materials only:- seeds, fertilizers and sprays. Clearly

fixed costs together accounted for the largest part of total costs, labour being by far the most important item in this category. In 1973-74 direct labour was recorded for each enterprise and this was used as a basis for allocating the corresponding labour costs between enterprises again in 1974-75. In both years there was overhead labour which, along with the costs of machinery and power, rent and rates, and other fixed costs was not allocated. These items cannot easily and meaningfully be allocated between enterprise.

Tables 10A and 10B are of interest in that they show the extent of the differences in intensity of farming as between hill and upland farms and between farms of different sizes within each of these types. It is not surprising that, for reasons of better quality land, lower altitudes, and somewhat less harsh climatic conditions, the average enterprise output per hectare for upland farms was at least 50 per cent more than that for hill farms. Obviously the level of inputs per hectare was also very much higher for upland farms; total inputs per hectare were 70 per cent, 80 per cent, and 92 per cent higher for upland than for hill farms in the three successive years. The fixed costs constituted a third or just under one third of total inputs on both types of farm, and whilst both fixed and variable costs per farm and per hectare increased over the three years, the latter increased proportionately the more. The effects of the unfavourable relationship between cattle and sheep prices and input prices in 1974-75 is again reflected in the value of total inputs per £100 worth of enterprise output, more especially for the hill farms. Using the total inputs per £100 enterprise output as the basis of

assessment, the hill farms were on average, rather the more efficient in 1973-74, but the two groups were more or less equal in this respect in 1975-76.

An examination of the changes in inputs per £100 enterprise output with increasing size of farm (Tables 11A and 11B) which, to a large extent, should reflect economies of scale, reveals some interesting facts.

1. For the hill farms the average total inputs per £100 output is even higher for the group of middle sized farms than for that of smaller ones. It is for the group of largest sized farms, of 123 effective hectares or over, than economies of scale, which are very substantial, are achieved. This pattern is brought about largely through the medium sized farms having incurred higher costs of away-wintering of ewes than had the other two size groups (Table IA in Appendix A). Economies of scale in fixed costs are achieved for the medium and large sized hill farms, but again they are much more apparent for the largest size group. The economy in fixed costs between the small and medium sized farms may be exaggerated by the possible under utilization of family labour on the smallest farms.

2. Strangely, for the upland farms, it is the fixed costs per unit of output which are higher for the middle than for the small size farms, the variable costs per unit of output showing substantial reductions throughout. The labour and

machinery costs per hectare decline with increasing size of farm, but the output per hectare is surprisingly low for the middle sized compared with the smallest and largest size groups.

Efficiency in energy utilization

Considerable interest is taken at present in the relative efficiencies of various types of farming in the utilization of energy, more especially that obtained from dwindling stocks of oil and manufactured supplies of fertilizer. The figure in Tables 10B and 11B show that, for the sample of farms used in this study, hill farms made by far the most efficient use of artificial fertilizer, measured by the cost of fertilizer per unit of output; less so in 1974-75 because of the peculiar economic circumstances in that year.

The increasing proportion of rough grazing was obviously the main reason for the declining input of fertilizer per unit of output with increasing acreage of hill farm. Amongst the sample of upland farms it was the group of middle sized farms which showed the least efficiency and the group of largest farms the highest efficiency in this respect in both years.

Although depreciation accounts for a considerable proportion of the 'machinery and power' costs, the latter show broadly the relative efficiency of the two types of farms in their use of fuel and electrical power. Tables 11A and 11B are not conclusive in the

evidence they give as to which of the two types is the more efficient in this respect. However, appreciable economies of scale in the use of power with increasing hectarage are shown for both types.

Table 10A

Output, Variable and Fixed Costs and Net Farm Income on Welsh Hill Farms in 1973-74, 1974-75 and 1975-76
Per Effective Hectare

Size Group (Effective Hectares)	1973-74				1974-75				1975-76
	0-65	66-122	123+	All Farms	0-65	66-122	123+	All Farms	All Farms
No. of Farms	10	13	16	39	10	13	16	39	39
Average Size (Effective Hectares)	53	94	199	126	53	93	202	128	128
Enterprise Outputs	£	£	£	£	£	£	£	£	£
Breeding Herd	31	18	17	19	33	18	19	20	22
Other Beef Cattle	22	13	11	12	19	9	8	9	19
Sheep & Wool	55	45	46	47	48	40	41	42	57
Other	5	4	2	3	4	2	2	2	3
Total	113	80	76	81	104	69	70	73	101
Variable Costs	18	17	10	13	27	21	15	18	23
Gross Margin before Forage	95	63	66	68	77	48	55	55	78
Forage Variable Costs	8	3	2	3	9	4	4	4	6
Gross Margin after Forage	87	60	64	65	68	44	51	51	72
Fixed Costs	62	41	29	36	74	48	34	42	49
Management & Investment Income	24	19	35	30	-6	-4	17	9	23
Farmer & Wife Manual Labour	29	16	8	12	36	21	9	15	19
Net Farm Income	53	35	43	42	30	17	26	24	42
Return on Tenant's Capital %	18	18	43	33	-4	-4	20	9	NA

Table 10B

Output, Variable and Fixed Costs and Net Farm Income on Welsh Upland Farms in 1973-74, 1974-75 and 1975-76 Per Effective Hectare

Size Group (Effective Hectares)	1973-74				1974-75				1975-76
	0-65	66-122	123+	All Farms	0-65	66-122	123+	All Farms	All Farms
No. of Farms	6	8	5	19	6	8	5	19	17
Average Size (Effective Hectare)	38	86	178	95	39	82	176	93	101
Enterprise Output	£	£	£	£	£	£	£	£	£
Breeding Herd	40	23	30	28	56	30	41	39	37
Other Beef Cattle	39	22	21	24	43	30	12	23	40
Sheep & Wool	74	55	72	66	74	53	67	63	85
Other	14	12	5	9	19	16	11	14	13
Total	167	112	128	127	192	129	131	139	175
Variable Costs	42	23	24	26	65	32	29	35	42
Gross Margin before Forage	125	89	104	101	127	97	102	104	133
Forage Variable Costs	12	9	8	9	15	10	6	9	11
Gross Margin after Forage	113	80	96	92	112	87	96	95	122
Fixed Costs	86	61	47	57	110	77	60	73	86
Management & Investment Income	27	19	49	35	2	10	36	22	36
Farmer & Wife Manual Labour	38	18	9	16	44	23	11	20	24
Net Farm Income	65	37	58	51	46	33	47	42	60
Return on Tenant's Capital %	13	14	32	23	1	7	22	13	na

Table 11A

Inputs per £100 Enterprise Output by Farm Size
in 1973-74, 1974-75 and 1975-76

Hill Farms

Size Group (Effective Hectares)	1973-74				1974-75				1975-76
	0-65	66-122	123+	All Farms	0-65	66-122	123+	All Farms	
Variable Costs per £100 Enterprise Output	16	21	13	16	26	30	21	25	23
Fixed Costs per £100 Enterprise Output	55	51	38	44	71	70	49	58	49
Total Inputs per £100 Enterprise Output	71	72	51	60	95	100	70	83	72
Fixed Costs per cent of Gross Margins (after Forage)	71	68	45	55	109	109	67	82	68
Cost of Labour per £100 Enterprise Output	31	25	20	22	41	36	24	30	-
Fertilizer Cost per £100 Enterprise Output	6.2	3.8	2.6	3.7	7.7	5.8	4.3	4.1	-
Machinery & Power Cost per £100 Enterprise Output	10.6	12.5	7.9	9.9	12.5	15.9	10.0	12.3	-

Table 11B

Inputs per £100 Enterprise Output by Farm Size in 1973-74, 1974-75 and 1975-76

Upland Farms

Size Group (Effective Hectares)	1973-74				1974-75				1975-76
	0-65	66-122	123+	All Farms	0-65	66-122	123+	All Farms	All Farms
Variable Costs per £100 Enterprise Output	25	21	19	20	34	25	22	25	24
Fixed Costs per £100 Enterprise Output	51	54	37	45	57	60	48	53	49
Total Inputs per £100 Enterprise Output	76	75	56	65	91	85	70	78	73
Fixed Costs per £100 Gross Margin (after Forage)	76	76	49	62	98	89	63	77	70
Cost of Labour per £100 Enterprise Output	23	28	16	20	28	31	21	25	
Fertilizer Cost per £100 Enterprise Output	6.0	6.3	5.5	6.3	5.7	6.2	3.8	5.0	-
Machinery & Power Cost per £100 Enterprise Output	13.2	10.7	9.4	10.2	11.5	12.4	9.9	10.8	-

CHAPTER 4

The Beef and Sheep Enterprise

This section of the report concentrates on the physical and financial data obtained for individual farm enterprises. In the North of England survey three types of farm were surveyed namely, hill, upland, and dairy with sheep, farms. However, the inclusion of the latter type was not possible in the Welsh study because of the scarcity of upland/hill farms with dairy herds in the F.M.S. sample

On each farm in the Welsh study, three enterprises were distinguished, namely the beef breeding herd which included calves to weaning, other beef cattle, and the sheep flock.

A. The Beef Breeding Herd

Breeds and Breeding Policy

Average herd sizes by farm size groups within the hill and upland categories are quoted in Table 7. From these it is ascertained that the survey beef cow herds were, on average, larger in size on the upland than on the hill farms; for this reason, and because of the purchase of some store cattle, the number of other beef cattle carried were also greater for the former.

A fairly clear pattern of breeds and breeding policy according to type of farm, emerges. Amongst the hill group of farms 22 of the 39 farms carried predominantly Welsh Black herds which were serviced

solely by bulls of the same breed. Another 8 hill farms had either Welsh Black cows or bulls in their beef breeding herds, whilst the remaining 9 had Hereford crosses. In the upland category the incidence of Welsh Black breeding stock was much less; only two herds were of pure Welsh Black whilst the remainder, 17 herds, were a mixture of Hereford and Hereford Friesian crosses served mainly by Hereford bulls; Charolais, Simmental, and Limousin bulls were each listed once.

It needs to be pointed out that a few of the hill farms were involved in the production of pedigree Welsh Black breeding stock, and the value of the output for these farms was, therefore, greater than that from those whose output consisted of suckled calves or young stores intended for fattening. The average value of the output for hill farms was, therefore, somewhat distorted, but was considered acceptable as the breeding of replacement pedigree stock is an alternative which is open to hill and upland farmers.

Calving

Calving on hill and upland farms generally takes place during the late winter and spring in order that the peak milk yield coincides with maximum growth of grass. For those farmers who dispose of their young stock as 8-12 month old suckled calves, this is the ideal calving time. Once weaning or sale of calves has taken place the cow can be dried off and then prepared for the subsequent birth. For those farmers taking young stock to older ages either for sale as forward stores or for fattening, the date of sale, the relative

prices of different aged cattle at that time, together with the number of winters and the costs involved in producing the animal, are other factors to be considered. Generally there are more options open to the upland farmer than to the hill farmer; because of the easier physical and climatic conditions associated with his farm, the upland farmer can be somewhat more flexible in his calving and selling patterns and, thereby, secure better protection from adverse market forces.

In general there was a clear tendency towards spring calving amongst the two groups of farms; however, in many cases there was not so much a concentration of calvings in the spring month, but rather all the year round calving with a slight preponderance of births in the spring. No attempt, therefore, was made to analyse any of the data on the basis of calving dates.

The calving indices reveal a picture of fairly significant difference between hill and upland herds and between different sized herds, but one which is not consistent for the two years(Tables 14 and 15). The upland herds in 1973-74 had a much lower calving index than had the hill herds whilst in the following year it was slightly higher, a fact which is difficult to explain. The upland herds would be expected to show a better level of performance since they experience less harsh conditions. The figures for calf mortality were very slightly more favourable for the upland farms in both years. There was a fairly clear inverse relationship between the calving index and size of hill herds, whilst the opposite tendency was apparent for the upland herds.

Herd Replacement

Most hill and upland beef herds are replaced almost entirely by home-bred and-reared heifers. There appears to be no clearly consistent pattern with regard to the annual replacement rate. For the years 1973-74 and 1974-75 respectively hill farmers replaced 19 and 16 per cent of their herds, and upland farmers 15 and 18 per cent. On the basis of these two years only, the average herd life was 5.75 years for the hill farms and 6.1 for upland farms. Broadly, the larger the herd the longer its average life, or the smaller the proportion of the herd replaced annually. The annual rate of replacement is normally determined by the relative prices of replacement heifers and cull cows, the farmer's experience with regard to the performance and value of old cows, the level of fertility amongst older cows, the calving index, mortality amongst both cows and young stock being reared and, possibly by the area of poorer grazings available for grazing young stock. The 'cost' of herd maintenance or herd replacement is the difference between, on the one hand the opening valuation of the breeding herd plus the value of cows purchased and heifers transferred into the herd and, on the other, the closing valuation plus the value of cows sold or transferred out of the herd.

Provided the breeding cow's advancing age has affected neither the calving index nor the quality of the calves, with stable prices for heifer replacements and cull cows, the longer the average life of the herd, the less the cost of herd replacement (or of herd maintenance). However, during a period of rapidly rising prices, assuming that the

prices of both cull cows and their replacements increase by roughly the same proportion, the cost of herd replacement increases, as is illustrated by the following hypothetical figures -

	1972	1978
	£	£
In-calf Heifer	200	300
Cull Cow	120	180

If prices remained at the 1972 level, assuming an average herd life of 6 years per cow, the average annual replacement cost, in 1972 and 1978, would be $\frac{£200-£120}{6}$ = £13.67 per cow. However, if each of the two prices had increased by 50 per cent over the 6 year period, the replacement cost in 1978 would also have been increased by 50 per cent i.e. to $\frac{£300-£180}{6}$ = £20 per cow. Under these and similar circumstances the choice as to whether, if possible, to replace a smaller or larger proportion of the herd annually, must depend on the extent to which this increase in cost affects the level of the net margin or profit per cow, in real terms.

For the samples of farms reviewed in this report the average herd replacement 'cost' per breeding cow in the herd increased from an appreciation of £5 in 1973-74 to a depreciation of £8 in 1974-75, for hill herds, whilst it declined from £3 to £1 for the upland herds. These differences are explained by changes in the relationship between the value of home-reared in calf heifers transferred into the herd on the one hand and the prices realized for cows sold on the other. For hill farms the average price for cows sold in 1973-74 was very high compared with that for the same farms in 1974-75 and for upland

farms in 1973-74. The first difference is partly explained by the drop in cattle prices in the autumn of 1974, a trend which may have commenced in the spring when many of the barren cows from the hill herds would have been sold.* The second difference, namely the very much lower prices for cows sold off upland farms in 1973-74 compared with those sold off hill farms in the same year, is largely explained by the fact that, for some reason, the former included a much higher proportion of casualties (fetching anything from £5 - £15 each) than did the former.

Output

Tables 12 and 13 in the text and Tables IIA and IIB in Appendix A show the enterprise output, variable costs and gross margins for the beef breeding herd, each expressed on a per breeding cow basis. Included in the output of the breeding herd are the sale of and transfers out (into the rearing unit) of the calves at weaning, the hill cow and calf subsidies, and credit allowed for milk consumed in the household or given to employees as part payment of wages. Allowance is also made for calves which have to be purchased for suckling in place of home-produced calves which have died. This sum total is adjusted by the 'cost' of herd replacement which can be a positive or a negative sum.

*The accounts for the majority of hill farms closed in December 1974 whereas most of those for upland herds closed in the spring.

The enterprise output per breeding cow was, on average, higher for the upland than for the hill farms in 1974-75 and 1975-76 but, surprisingly, lower for the former than the latter in 1973-74. The main reasons for this appear to be the relatively higher costs of herd maintenance and of replacement calves on upland farms in 1973-74, the latter following on the low calving index and relatively fewer calves reared on these farms.

Normally the value of weaned calves sold or transferred out constitutes the main portion of the output of the breeding herd. However in 1974-75, the hill cow and calf subsidies together are by far the most important item - a result of the double payment of the hill cow subsidy within the year 1974-75, a move taken by the government to alleviate the situation created by the unusually low prices for store and fat cattle in the autumn of 1974 (Tables IIIC and IIID in Appendix B).

There was no clear relationship between the value of the enterprise output per breeding cow and the size of herd.

Inputs

The most important item of variable costs, measured on a per breeding cow basis, on both types of farms was purchased concentrates, accounting for between about 30 and 40 per cent of all variable costs (including those of forage) - see Appendix A Tables IIA and IIB. Home-grown concentrates are of relatively little significance on hill farms, but rather more important on upland farms, especially

Table 12

Output, Variable Costs and Gross Margins Per Breeding Cow for the Beef Breeding Herd 1973-74, 1974-75 and 1975-76.

Hill Farms

Herd Size	1973-74				1974-75				1975-76
	0-20	21-29	30+	All Farms	0-20	21-29	30+	All Farms	All Farms
No. of Herds	12	14	13	39	12	14	13	39	39
Average Size of Herd	12	24	44	27	14	26	44	28	27
	£	£	£	£	£	£	£	£	£
Total Enterprise Output	87	92	84	87	102	86	91	91	103
Livestock Variable Costs	27	22	11	16	29	33	18	25	26
Gross Margin before Forage	60	70	73	71	73	53	73	66	77
Forage Variable Costs	10	5	5	6	15	6	6	7	n.a.
Gross Margin after Forage	50	65	68	65	58	47	67	59	
Direct Labour	14	13	8	11		n.a.			
Gross Margin after Forage and Labour	36	62	60	58					

Table 13

Output, Variable Costs and Gross Margins Per Breeding Cow for the Beef Breeding Herd in 1973-74, 1974-75 and 1975-76

Upland Farms

Herd Size	1973-74				1974-75				1975-76
	0-20	21-29	30+	All Farms	0-20	21-29	30+	All Farms	All Farms
No. of Herds	6	6	7	19	6	6	7	19	17
Average Size of Herd	18	24	63	36	19	23	61	36	35
	£	£	£	£	£	£	£	£	£
Total Enterprise Output	69	73	76	74	103	101	101	101	108
Livestock Variable Costs	23	18	18	19	31	41	31	33	29
Gross Margin before Forage	46	55	58	55	72	60	70	68	79
Forage Variable Costs	13	3	8	7	10	4	7	7	n.a.
Gross Margin after Forage	33	52	50	48	62	56	63	61	
Direct Labour	13	8	8	9		n.a.			
Gross Margin after Forage and Labour	20	44	42	39					

Table 14

Certain Efficiency Factors Relating to the Beef Breeding Herd on Hill Farms

Herd Size	1973-74				1974-75			
	0-20	21-29	30+	All Herds	0-20	21-29	30+	All Herds
No. of Herds	12	14	13	39	12	14	13	39
Efficiency Factors	%	%	%	%	%	%	%	%
Calving Index	101	98	87	93	93	90	85	88
Calf Mortality	3.4	4.5	3.7	3.9	6.7	4.6	3.3	4.3
Calves Reared	98	93	84	89	87	86	82	84
Cow Mortality	4.7	1.8	0.6	1.8	1.2	3.3	1.4	2.0
Herd Replacements (% of OV & CV of Breeding Herd	29	21	15	19	21	22	11	16
of which: Purchased	2	1	3	2	4	1	-	1
Home Reared	27	20	12	17	17	21	11	15
Prices and Values	£	£	£	£	£	£	£	£
Calves Sold	47	40	50	45	13	20	36	29
Calves Transferred to 'Other Cattle'	49	48	49	49	40	32	36	35
Cows Sold	128	158	133	144	78	111	72	87
Purchased Replacements	180	180	157	164	151	145	173	154
Heifers Transferred in	83	107	95	96	105	97	94	97

Table 15

Certain Efficiency Factors Relating to the Beef Breeding Herd on Upland Farms

Herd Size	1973-74				1974-75			
	0-20	21-29	30+	All Herds	0-20	21-29	30+	All Herds
No. of Herds	6	6	7	19	6	6	7	19
Efficiency Factors	%	%	%	%	%	%	%	%
Calving Index	75	78	84	81	88	84	95	91
Calf Mortality	2.8	7.0	2.9	3.8	4.5	5.1	3.5	87
Calves Reared	72	71	81	77	84	79	92	87
Cow Mortality	1.9	1.4	1.6	1.6	4.5	4.4	1.9	2.8
Herd Replacement (% of OV & CV of Breeding Herd)	14	16	15	15	25	20	16	18
of which: Purchased	2	3	-	1	4	4	-	2
Home Reared	12	13	15	14	21	16	16	16
Prices and Values	£	£	£	£	£	£	£	£
Calves Sold	40	45	47	47	31	20	62	39
Calves Transferred to 'Other Cattle'	49	48	55	53	40	35	38	38
Cows Sold	96	102	79	88	58	95	91	88
Purchsed Herd Replacements	193	139	-	157	112	83	148	106
Heifers Transferred in	86	86	101	96	81	91	93	90

in 1974-75. On the hill farms as a group, the average cost of purchased bulk feeds was greater than that of home-grown concentrates, but the opposite was the case for the sample of upland farms. The variable costs of forage, amongst which fertilizer cost is by far the largest item, accounted for 27 per cent of all variable costs on both hill and upland farms in 1973-74 and for about 20 per cent on each in 1974-75.

The average total variable costs per breeding cow on hill farms tended to decline with increasing herd-size, but no such pattern emerged for the upland farms. The main reason for this trend on hill farms was the decline in cost of purchased concentrates which is not compensated for by an increase in either purchased bulk or home-grown concentrates. However, overall, more reliance is placed on purchased bulk feeds on hill than on upland farms, and it is obvious that the diet for cows on the former contains less concentrates than does that on the latter.

Gross Margins

The gross margin for each enterprise is the difference between its enterprise output and the variable or specific costs which are incurred in attaining that output. In Tables 10A, 10B, 12 and 13 in the text and Tables IIA and IIB in the Appendix, the gross margins are shown before and after the allocation of the variable costs of forage. The latter, which include the variable costs (seeds, fertilizer and sprays) on grassland used both for grazing and for hay, having been allocated between the breeding herd, other cattle, and sheep, on the basis of the relative use made of grassland (excluding rough grazings) by each of these enterprise.

Whereas in 1973-74 the gross margins per cow were very much higher for the hill than for the upland herds, in the following year, there was little to choose between the two categories in this respect. The reasons for these differences have already been explained under 'output' and 'inputs' on the previous pages. However, what is of greater importance is the gross margin and the net margin per hectare. Because of the heavier stocking with cattle possible on the upland farms, the gross margins per hectare were appreciably higher in both years for the upland farms.

Reference has already been made to the fixed costs, and the economies of scale which may be reaped with increasing farm size. The direct labour costs per breeding cow (Tables IIA and IIB in Appendix A) indicate clearly the economy in labour utilization achieved by the medium and large compared with the small hill and upland herds. No such trend is apparent between the medium and large herds. Since, as is suggested in Table 7, the small herds are kept on the small farms, the 'economy' in labour just mentioned as being realized by the medium sized and large herds, is probably partly the result of underutilized family labour on the small farms.

The Other Beef Cattle

As already mentioned, in this study the cattle enterprises on the survey farms were subdivided into the beef breeding herd and the cattle rearing or other beef cattle enterprise. The former included all breeding stock (heifers were transferred in at point of calving) plus calves until weaned when they were transferred into the cattle rearing

section. The latter, therefore, included all 'other cattle' on the farm and due to the market fluctuations, which took place during the three years, the value output of these fell quite dramatically in 1974-75 - to a greater extent than did that of the beef breeding herd, which received the double payment of hill cow subsidy.

The results of the beef cattle rearing enterprise are expressed (Tables 16 and 17 in the text, and Tables IIC and IID in Appendix A) per grazing livestock unit.* The livestock unit equivalent for each category of livestock reared is shown in Appendix B. A breeding cow has been taken as being for present purposes, the equivalent of 0.6 livestock units (A dairy cow is normally taken to be 1 livestock unit). The enterprise out for the rearing enterprise consists of store and, sometimes, some finished cattle (normally at least a year old) sold, heifers transferred into the breeding herd at point of calving, carcase value of dead animals if any, and stores, finished animals, and young replacement heifers in the closing valuation, less stores and finished animals in the opening valuation, calves transferred in from the breeding herd section, and weaned calves, and stores purchased.

There was little difference in the average enterprise output per livestock unit between hill and upland farms in 1973-74, but for

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* including, of course, only the cattle being reared after weaning.

Table 16

Output, Variable Costs and Margins from Other Beef Cattle on Hill Farms in 1973-74, 1974-75 and 1975-76 Per Grazing Livestock Unit

Herd Size (Breeding Cows)	1973-74				1974-75				1975-76
	0-20	21-29	30+	All Herds	0-20	21-29	30+	All Herds	All Herds
No. of Herds	12	14	13	39	12	14	13	39	39
	£	£	£	£	£	£	£	£	£
Total Enterprise Output	89	110	116	109	72	59	85	73	n.a.
Livestock Variable Costs	25	22	25	24	35	31	39	36	
Gross Margin before Forage	64	88	91	85	36	28	45	37	
Forage Variable Costs	10	6	7	7	15	7	8	8	
Gross Margin after Forage	54	82	84	78	21	21	37	29	
Direct Labour	17	15	11	13		n.a.			
Gross Margin after Forage and Labour	37	67	73	65					

Table 17

Output, Variable Costs and Margins from Other Beef Cattle on Upland Farms in 1973-74, 1974-75 and 1975-76 Per Grazing Livestock Unit

Herd Size (Breeding Cows)	1973-74				1974-75				1975-76
	0-20	21-29	30+	All Herds	0-20	21-29	30+	All Herds	All Herds
No. of Herds	6	6	7	19	6	6	7	19	17
	£	£	£	£	£	£	£	£	£
Total Enterprise Output	107	99	100	102	125	74	84	91	n.a.
Livestock Variable Costs	35	40	34	36	56	57	44	50	
Gross Margin before Forage	71	58	66	66	69	17	39	41	
Forage Variable Costs	12	2	10	9	9	4	9	8	
Gross Margin after Forage	59	56	56	57	60	13	30	33	
Direct Labour	14	17	9	12	n.a.				
Gross Margin after Forage and Labour	45	39	47	45					

1974-75 the average for hill farms at £73 was £18 per livestock unit less than that for the upland farms. For hill farms, the output from reared cattle per livestock unit was highest for the group of largest sized herds (30 cows and over) in both years, whereas amongst the upland farms the smallest farms group had the highest output of cattle reared per livestock unit. This suggests, very strongly, that the largest hill farms keep their store and some finished cattle for selling at an older age, than do the smaller ones. The older cattle can make better use of the greater abundance of 'cheap' rough grazings than can younger stock, and thereby provide a better margin per head. On the smaller hill farms the aim must be to sell off at a yonger age, so as to keep more breeding cows on the available better grassland, and thereby qualify for a larger herd total of hill cow subsidy. This statement does not appear to apply to the various size groups of upland farms, the figures for which in 1974-75 especially, suggest that the smaller farms received very much better prices for their cattle than did the smaller hill farms. Upland herds had incurred very much higher costs of concentrates (purchased and home-grown) than did the hill farmers - a reflection no doubt of the more intensive rearing systems on the former and, possibly, - although the output figures do not support this, of their selling at a younger age.

The average gross margins (before and after charging the variable costs of forage) per livestock unit were appreciably higher for hill than for upland farms in 1973-74, but they were slightly higher for upland farms in the following year. They increased with increasing

size of hill farm clearly and consistently in 1973-74, but not consistently in 1974-75. In both years, the average gross margin per livestock unit was highest for the group of smallest sized, and lowest for the group of middle sized farms.

B. The Sheep Flock

The relative importance of the sheep and cattle on the hill and upland farms has been revealed to some extent in Table 7, by the average relative number of sheep and cattle carried. Largely because of the larger proportion of rough grazings sheep were by far the more important enterprise on hill farms, but cattle were the more prominent on the uplands. Thus the former carried just over 20 ewes for every beef cow whereas the latter only just over 10 ewes per cow. Making the comparison on the basis of livestock units, whereas on the hill farms there were, on average, 1.38 units of sheep per unit of cattle, there was only 0.75 per unit of cattle on the upland farms. Naturally, and again primarily by reason of the relative proportion of rough grazings to the total farm acreage, the relative numbers and importance of sheep and cattle vary by farm size - from 0.76 units of sheep per unit of cattle for the group of small to 1.64 units of sheep for the largest hill farms; and from 0.64 for the smallest upland to about 0.8 for each the middle and largest upland farms.

Sheep farmers experienced relatively more prosperous times in 1976 and 1977 than for many a year, a situation occasioned by the continued accessibility of the European market, France in particular, and the

still divergent price levels of the British and French markets. Recently there has been some cause for concern amongst British producers in that Eire has negotiated a bilateral arrangement with France to export lamb levy-free, a favour which will not be extended to other supplier countries. However, this can only be a temporary arrangement, in which case the medium term prospects for British sheep-meat producers look fairly bright.

It is in this situation that hill sheep producers have been expanding, to a certain extent their flocks in the past few years. Evidence from our samples of flocks, available only for 1973-74 and 1974-75 indicate that in 1974-75 profitability was affected by the general decline in prices which occurred at that time. The average value of output per 100 ewes fell in the hill and upland samples by 12 and 7 per cent respectively in 1974-75 as compared with the previous year. However in 1975-76 the average output had risen again, on both hill and upland farms, to a value appreciably above that for 1973-74.

Breeds and Breeding Policy

As with the beef breeds there was a fairly clear demarcation between the hill and upland farms. The rate of hill sheep subsidy (or compensatory allowance) for which a flock within the less favoured area is eligible, depends upon the breed of ewes concerned as well as on the degree to which the flock is self-maintained. As the distinction between hill and upland farms, for the purposes of this report, has rested partly upon the level of hill subsidy received it is not surprising to find that the hill farms in the survey carried

mainly pure Welsh Mountain ewes and rams (with slight local variation). This ensures that ewes and rams with an adequate degree of hardiness are available for replacement when required; a few farmers, however, made use of Suffolk rams for crossing with a number of the older ewes in order to obtain a larger cross-bred lamb which is more attractive in the fat lamb market.

Meanwhile the upland flocks were characterised by a much wider variety of breeds of both ewes and rams. Only three of the upland flocks carried Welsh half-breds; amongst the rams the Suffolk breed which was carried on 14 of the 19 farms, was dominant, followed by the Border Leicester (on 7 farms), the Welsh Mountain (on 6), the Kerry and Clun (on 4 farms each), and the Dorset Horn and Hampshire Down (1 flock each).

Lambing and Replacement Rates

It is not surprising to find that lambing rates and lamb disposal rates were higher on the upland farms. Whereas the hill flocks reared, on average, about 90 lambs per 100 ewes put to the ram, the upland flocks achieved a corresponding figure of about 103. Less prolific ewes and the harsher conditions on hill farms undoubtedly is the main reason for this difference. There was no relationship between number of lambs born and reared on the one hand, and the size of flock on the other. Flock replacement rates were rather similar for both flocks, just under or about one third of the flocks being replaced annually. However, whereas in the case of the hill flocks, taken as a whole, practically all replacements were home bred and reared

nearly one third of the replacements for upland flocks were purchased. (See Tables IIIC and IIID in the Appendix).

Enterprise Output

This comprises of the value of lambs sold and retained on the farm, the hill sheep subsidy, wool, and the 'cost' of flock maintenance. The latter can be appreciably affected by the relative prices of breeding ewes in the opening and closing valuations. During a period when prices are rising, the value of breeding stock sold and transferred out and those in the closing valuation may be greater than those in the opening valuation, transferred in, and purchased. In such a case, as in 1973-74 for both hill and upland flocks, herd maintenance represented an appreciation denoted by a plus sign which was credited to the flock enterprise output, rather than a 'cost' charged against it. The 'other sheep' output, consisting of the output from lambs carried over from the previous year and sold in the current year and also the output from lambs purchased for fattening in the current year, added to the flock enterprise output gives the Total Sheep Enterprise Output.

On examining the average enterprise output figures for both categories of flocks (Appendix A Tables IIIA and IIIB), one is immediately struck by the importance of the value of lambs sold fat, for these account for about one-third and just over one half of the average enterprise outputs of the hill and upland flocks respectively.

In an effort to increase their farm outputs at relatively little cost, hill farmers have been increasing the proportion of lambs they sell off in fat condition. The lambs are normally fattened off rape, often sown within the farm programme of hill land improvement and maintenance. The upland farmers are more likely to finish a large proportion of their lambs off their more abundant, better quality, pastures.

Whereas on hill farms fat lamb sales provided two and a half and three times the revenue from store lambs in 1973-74 and 1974-75 respectively, for upland flocks the corresponding figures were almost four and six and a half. The total sale of lambs accounted for about 44 per cent of the average flock output for hill farms and for about 60 per cent of that for upland farms. The lambs retained for breeding, legitimately an item of output, were transferred into the breeding flock at values related to those applied to the breeding flock at that time, and were probably rather less than the market values of ewe lambs for breeding. Even so, these lambs contributed more to output than did the sale of store lambs within both categories of flock.

The hill sheep subsidy contributed less than expected to output (because of the increasing prices of livestock), although it still contributed substantially to the net incomes of hill and upland farmers. For both upland and hill flocks the subsidy was much higher in the second year largely because of an increase of just over 87 per cent in the basic rate and one of about 71 per cent in the full rate.

Table 18

Output, Variable Costs, and Margins, for the Flocks on Hill Farms in 1973-74, 1974-75 and 1975-76 Per 100 Ewes Put to the Ram

Flock Size (Breeding Ewes)	1973-74				1974-75				1975-76
	0-299	300-499	500+	All Flocks	0-299	300-499	500+	All Flocks	All Flocks
No. of Flocks	9	15	15	39	9	15	15	39	39
Average Flock Size	225	407	845	534	235	416	849	541	560
	£	£	£	£	£	£	£	£	£
Total Enterprise Output	1150	1084	1127	1116	964	950	1008	986	1296
Livestock Variable Costs	138	156	137	143	148	202	172	178	207
Gross Margin before Forage	1012	928	990	973	816	748	836	808	1089
Forage Variable Costs	48	24	23	26	74	31	31	35	n.a.
Gross Margin after Forage	964	904	967	947	742	717	805	773	
Direct Labour	152	147	93	115	n.a.				
Gross Margin after Forage and Labour	812	757	874	832					

Table 19

Output, Variable Costs, and Margins, for the Flocks on Upland Farms in 1973-74, 1974-75 and 1975-76 Per 100 Ewes Put to the Ram

Flock Size (Breeding Ewes)	1973-74				1974-75				1975-76
	0-299	300-499	500+	All Flocks	0-299	300-499	500+	All Flocks	All Flocks
No. of Flocks	7	8	4	19	7	8	4	19	17
Average Flock Size	201	359	884	411	214	369	875	418	
	£	£	£	£	£	£	£	£	£
Total Enterprise Output	1600	1353	1615	1516	1294	1342	1516	1409	1855
Livestock Variable Costs	256	106	261	203	264	114	210	184	214
Gross Margin before Forage	1344	1247	1354	1313	1030	1228	1306	1225	1641
Forage Variable Costs	76	58	71	67	81	48	70	64	n.a.
Gross Margin after Forage	1268	1189	1283	1246	949	1180	1236	1161	
Direct Labour	180	163	112	143	n.a.				
Gross Margin after Forage and Labour	1088	1026	1171	1103					

Only in the second year, i.e., 1974-75, and then only for the upland flocks was there a tendency for both the flock enterprise output and total sheep output, per 100 ewes, to be related to flock size, the group of largest flocks showing the best results in this respect.

Inputs

Some interesting differences between hill and upland flocks are exhibited by the various items of and total variable costs, and by the cost of labour per 100 ewes put to the ram. The total variable costs were very much higher for upland than for hill flocks in 1973-74 but there was very little difference in the following year. The winter feeding problem created by the relatively large area of rough grazings on hill farms, is reflected in the high cost of agistment - by far the largest cost item for the group of hill farmers taken as a whole. This situation is very apparent on the medium and large hill farms, but the smaller ones are, in this respect, more akin to the average upland farm where purchased concentrates is the most prominent variable cost item. It is noticeable too that a similar wintering problem exists on many of the largest upland farms for which the average cost of agistment in 1973-74 was even higher than for the largest hill farms.

One rather surprising result shown in Appendix Tables IIIA and IIIB is the higher combined cost of veterinary and medicinal attention and treatment for the upland flocks as a whole compared with the hill ones. It is difficult to decide whether this is the result of good

or bad management without having a further breakdown of the cost; heavier expenditure on preventive medicines could be regarded as sound management practice, whereas heavier veterinary bills could be the result of either bad management on the part of the flockmaster or to physical and climatic conditions creating management problems. Hence one cannot conclude, solely on the basis of this one cost item, that, because they incur the higher veterinary and medicinal charges and have the higher lambing percentages and the lower mortality amongst ewes and lambs, that masters of upland flocks are, on the whole, better managers than their hill flock counterparts.

Again because of the much larger proportion of rough grazings and the poorer quality of the cultivated area associated with hill farms, the share, allocated to sheep, of the variable costs of forage, which are incurred almost wholly on the cultivated area as distinct from the rough grazings, are very much higher, even per 100 ewes, for the upland farms, which carry more ewes to the hectare, in winter and summer, than do hill farms.

Gross Margins

Largely because of the larger outputs, the gross margin per 100 ewes was very much higher for upland than for hill flocks in both years - about one third as much greater in the first and a half as much more in the second year. Whilst there was no direct relationship between the gross margin per 100 ewes and the size of hill flocks in both years and of upland flocks in the first year, there was a positive relationship between the gross margin and size of upland flocks in

1974-75. It is noticeable too in both years that, when such a relationship is not apparent, the gross margin is lowest for the middle sized flocks. The trend in gross margin follows closely that in enterprise output, changes in which have already been referred to.

The trend in the cost of direct labour per 100 ewes, where available, exhibits the 'economy of scale' expected to arise with increasing flock size, for both categories of flocks.

APPENDIX A

Table IA

Output, Variable & Fixed Costs, & Net Farm Income
on Welsh Hill Farms
Per Effective Hectare

Size Group (Effective Hectares)	1973-74				1974-75			
	0-65	66-122	123+	All Farms	0-65	66-122	123+	All Farms
No. of Farms	10	13	16	39	10	13	16	39
Average Size (Effective Hectares)	53	94	199	126	53	93	202	128
Enterprise Output	£	£	£	£	£	£	£	£
Breeding Herd	31	18	17	19	33	18	19	20
Other Beef Cattle	22	13	11	12	19	9	8	9
Sheep & Wool	55	45	46	47	48	40	41	42
Other	5	4	2	3	4	2	2	2
Total	113	80	76	81	104	69	70	73
Variable Costs								
Purchased Concentrates	9	8	4	6	13	9	5	7
Purchased Bulk Foods	2	3	1	1	4	4	2	3
Home Grown Concentrates	3	-	-	1	5	-	1	1
Agistment	1	4	3	3	2	5	4	4
Vet & Meds	2	1	2	2	2	2	2	2
Service Fees	-	-	-	-	-	-	-	-
Haulage	-	-	-	-	-	-	-	-
Casual, Contract & Other	1	1	-	-	1	1	1	1
Total	18	17	10	13	27	21	15	18
Gross Margin before Forage	95	63	66	68	77	48	55	55
Forage Variable Costs								
Seeds	1	-	-	-	1	-	1	1
Fertilizer	7	3	2	3	8	4	3	3
Sprays	-	-	-	-	-	-	-	-
Total	8	3	2	3	9	4	4	4
Gross Margin after Forage	87	60	64	65	68	44	51	51
Fixed Costs								
Labour	35	20	15	18	43	25	17	22
Machinery and Power	12	10	6	8	13	11	7	9
Rent, Rental Value & Rates	10	8	6	7	12	8	7	8
Other	5	3	2	3	6	4	3	3
Total	62	41	29	36	74	48	34	42
Management & Investment Income	24	19	35	30	- 6	- 4	17	9
Farmer & Wife Manual Labour	29	16	8	12	36	21	9	15
Net Farm Income	53	35	43	42	30	17	26	24
Tenant's Capital								
Livestock	101	77	66	72	110	77	69	75
Crops & Stores	11	4	4	4	12	5	4	5
Machinery	21	22	12	16	21	23	14	17
Total	133	10	82	92	143	105	87	97

Table IB

Output, Variable & Fixed Costs, & Net Farm Income
on Welsh Upland Farms
Per Effective Hectare

Size Group (Effective Hectares)	1973-74				1974-75			
	0-65	66-122	123+	All Farms	0-65	66-122	123+	All Farms
No. of Farms	6	8	5	19	6	8	5	19
Average Size (Effective Hectares)	38	86	178	95	39	82	176	93
Enterprise Output	£	£	£	£	£	£	£	£
Breeding Herd	40	23	30	28	56	30	41	39
Other Beef Cattle	39	22	21	24	43	30	12	23
Sheep & Wool	74	55	72	66	74	53	67	63
Other	14	12	5	9	19	16	11	14
Total	167	112	128	127	192	129	131	139
Variable Costs								
Purchased Concentrates	23	12	9	12	34	14	13	16
Purchased Bulk Foods	3	2	1	1	4	3	-	2
Home Grown Concentrates	4	3	2	3	13	10	7	9
Agistment	1	-	5	3	2	-	4	2
Vet & Meds	6	3	3	3	6	3	3	4
Service Fees	1	-	-	-	1	-	-	-
Haulage	1	1	1	1	2	1	1	1
Casual, Contract & Other	3	2	3	3	3	1	1	1
Total	42	23	24	26	65	32	29	35
Gross Margin before Forage	125	89	104	101	127	97	102	104
Forage, Variable Costs								
Seeds	1	2	1	1	3	2	1	2
Fertilizers	10	7	7	8	11	8	5	7
Sprays	1	-	-	-	1	-	-	-
Total	12	9	8	8	15	10	6	9
Gross Margin after Forage	113	80	96	92	112	87	96	95
Fixed Costs								
Labour	39	31	20	26	53	40	27	35
Machinery and Power	22	12	12	13	22	16	13	15
Rent, Rental Value and Rates	17	13	12	13	24	15	16	17
Other	8	5	3	5	11	6	4	6
Total	86	61	47	57	110	77	60	73
Management & Investment Income	27	19	49	35	2	10	36	22
Farmer & Wife Manual Labour	38	18	9	16	44	23	11	20
Net Farm Income	65	37	58	51	46	33	47	42
Tenant's Capital								
Livestock	167	107	112	117	171	114	116	122
Crops & Stores	15	6	10	9	19	10	15	14
Machinery	29	25	29	28	32	28	35	32
Total	211	138	151	154	222	152	166	168

Table IIA

Output, Variable Costs and Margins in the Beef Breeding Herd on Hill Farms Per Breeding Cow

	1973-74				1974-75			
	0-20	21-29	30+	All Herds	0-20	21-29	30+	All Herds
No. of Herds	12	14	13	39	12	14	13	39
Average Size of Herd	12	24	44	27	14	26	44	28
Enterprise Output	£	£	£	£	£	£	£	£
Calves Sold	4	1	1	1	1	1	3	2
Calves Transferred Out	40	50	44	46	36	31	29	31
Valuation Change (Calves)	4	- 3	-	-	-	- 7	- 3	- 4
Subsidies - Hill Cow	29	32	28	29	62	61	58	60
- Calf	9	9	9	9	9	11	13	11
Credits	2	1	1	1	3	-	-	1
Total	88	90	83	86	111	97	100	101
Herd Maintenance	+ 2	+ 7	+ 5	+ 5	- 6	-10	- 8	- 8
Calf Replacement	3	5	4	4	3	1	1	2
Total Enterprise Output	87	92	84	87	102	86	91	91
Variable Costs								
Purchased Concentrates	15	12	6	9	16	15	8	12
Purchased Bulk Foods	5	5	2	3	7	11	5	7
Home Grown Concentrates	1	1	1	1	-	2	2	2
Vet & Meds	2	2	1	1	2	3	2	2
Other	4	2	1	2	4	2	1	2
Total	27	22	11	16	29	33	18	25
Gross Margin before Forage	60	70	73	71	73	53	73	66
Forage Variable Costs								
Seeds	1	-	-	-	2	1	1	1
Fertilizer	9	5	5	6	13	5	5	6
Sprays	-	-	-	-	-	-	-	-
Total	10	5	5	6	15	6	6	6
Gross Margin after Forage	50	65	68	65	58	47	67	59
Direct Labour	14	13	8	11	n.a.			
Gross Margin after Forage and Labour	36	62	60	58				

Table IIB

Output, Variable Costs and Margins in the Beef Breeding Herd on Upland Farms Per Breeding Cow

Herd Size	1973-74				1974-75			
	0-20	21-29	30+	All Herds	0-20	21-29	30+	All Herds
No. of Herds	6	6	7	19	6	6	7	19
Average Size of Herd	18	24	63	36	19	23	61	36
Enterprise Output	£	£	£	£	£	£	£	£
Calves Sold	-	1	1	1	-	1	1	1
Calves Transferred Out	61	51	50	51	57	36	40	42
Valuation Change (Calves)	- 3	-12	-	- 3	1	- 1	- 8	- 5
Subsidies - Hill Cow	27	26	25	26	62	56	55	56
- Calf	17	13	11	12	15	17	13	14
Credits	1	-	1	1	1	1	1	1
Total	103	79	88	88	136	110	102	109
Herd Maintenance	- 2	+ 3	- 5	- 3	- 7	- 1	+ 1	- 1
Calf Replacement	32	9	7	11	26	8	2	7
Total Enterprise Output	69	73	76	74	103	101	101	101
Variable Costs								
Purchased Concentrates	9	8	8	8	15	17	15	15
Purchased Bulk Foods	5	2	1	2	5	3	1	2
Home Grown Concentrates	3	2	3	3	6	16	11	11
Vet & Meds	2	3	1	2	2	2	3	3
Other	4	3	5	4	3	3	1	2
Total	23	18	18	19	31	41	31	33
Gross Margin before Forage	46	55	58	55	72	60	70	68
Forage Variable Costs								
Seeds	1	1	1	1	1	1	1	1
Fertilizer	11	2	7	6	8	3	6	6
Sprays	1	-	-	-	-	1	-	-
Total	13	3	8	7	10	4	7	7
Gross Margin after Forage	33	52	50	48	62	56	63	61
Direct Labour	13	8	8	9	n.a.			
Gross Margin after Forage and Labour	20	44	42	39				

Table IIC

Output, Variable Costs and Margins from 'Other Beef Cattle'
Per Grazing Livestock Unit*
Hill Farms

Herd Size (Breeding Cows)	1973-74				1974-75			
	0-20	21-29	30+	All Herds	0-20	21-29	30+	All Herds
No. of Herds	12	14	13	39	12	14	13	39
Enterprise Output	£	£	£	£	£	£	£	£
Sales	122	140	165	148	111	104	120	112
Transfers Out	32	36	28	32	29	33	21	27
Other	-	-	-	-	-	-	-	-
Closing Valuation	141	158	137	145	137	121	125	126
Total	295	334	330	325	277	258	266	265
Less:-								
Opening Valuation	118	128	114	120	142	143	121	133
Purchases	29	13	2	11	5	6	3	4
Transfers In	59	83	98	85	58	50	57	55
Total	206	224	214	216	205	199	181	192
Total Enterprise Output	89	110	116	109	72	59	85	73
Variable Costs								
Purchased Concentrates	15	13	16	15	20	17	16	17
Purchased Bulk Foods	4	5	2	3	6	9	10	9
Home Grown Concentrates	2	2	2	2	2	1	9	5
Vet & Meds	1	1	2	1	1	1	2	2
Other	3	1	3	3	6	3	2	3
Total	25	22	25	24	35	31	39	36
Gross Margin before Forage	64	88	91	85	37	28	46	37
Share of Forage Variable Costs								
Seeds	1	1	1	1	2	1	1	1
Fertilizer	9	5	6	6	14	6	7	7
Sprays	-	-	-	-	-	-	-	-
Total	10	6	7	7	16	7	8	8
Gross Margin after Forage	54	82	84	78	21	21	38	29
Direct Labour	17	15	11	13	n.a.			
Gross Margin after Forage and Labour	37	67	73	65				

*Per G.L.U. of 'Other Beef Cattle'.

Table IID

Output, Variable Costs and Margins from 'Other Beef Cattle'
Per Grazing Livestock Unit*
Upland Farms

Herd Size (Breeding Cows)	1973-74 0-20	21-29	30+	All Farms	1974-75 0-20	21-29	30+	All Farms
No. of Herds	6	6	7	19	6	6	7	19
Enterprise Output	£	£	£	£	£	£	£	£
Sales	180	136	191	177	168	115	142	142
Transfers Out	12	18	28	23	18	18	28	23
Other	-	-	-	-	-	1	-	-
Closing Valuation	139	148	120	130	123	111	117	117
Total	331	302	339	330	309	245	287	282
Less:-								
Opening Valuation	141	121	132	132	123	123	123	123
Purchases	13	3	14	11	1	5	6	5
Transfers In	70	79	93	85	60	43	74	63
Total	224	203	239	228	184	171	203	191
Total Enterprise Output	107	99	100	102	125	74	84	91
Variable Costs								
Purchased Concentrates	20	22	17	19	25	34	17	23
Purchased Bulk Foods	2	2	2	2	6	3	2	3
Home Grown Concentrates	5	10	5	6	20	13	16	17
Vet & Meds	4	3	2	3	3	2	3	3
Other	4	3	8	6	2	5	6	4
Total	35	40	34	36	56	57	44	50
Gross Margin before Forage	72	59	66	66	69	17	40	41
Share of Forage Variable Costs								
Seeds	1	1	1	1	1	1	1	1
Fertilizers	10	2	9	8	7	3	8	7
Sprays	1	-	-	-	1	-	-	-
Total	12	3	10	9	9	4	9	-
Gross Margin after Forage	59	56	56	57	60	13	31	33
Direct Labour	14	17	9	12	n.a.			
Gross Margin after Forage and Labour	45	39	47	45				

Table IIIA

Output, Variable Costs and Gross Margins for Hill Flocks Per 100 Ewes Put to the Ram

Flock Size	1973-74				1974-75			
	0-299	300-499	500+	All Flocks	0-299	300-499	500+	All Flocks
No. of Flocks	9	15	15	39	9	15	15	39
Average Flock Size	225	845	534	534	235	416	849	541
Enterprise Output	£	£	£	£	£	£	£	£
Lambs Sold - Fat	515	359	305	342	414	364	286	322
- Store	79	114	167	143	66	57	139	107
Lambs Retained								
- Breeding	152	170	184	177	129	162	181	170
- Store	25	14	33	25	17	12	12	12
Hill Sheep Subsidy	166	175	170	171	282	306	295	297
Wool	74	84	92	88	80	94	100	96
Total	1011	916	951	946	988	995	1013	1004
Flock Maintenance	86	157	161	-53	-47	-18	-29	
Flock Enterprise Output	1097	1073	1112	1099	935	948	995	975
Other Sheep Output	53	11	15	17	29	2	13	11
Total Sheep Enterprise Output	1150	1084	1127	1116	964	950	1008	986
Variable Costs								
Purchased Concentrates	74	40	24	33	59	55	33	42
Purchased Bulk Foods	-	-	1	2	-	5	2	3
Home Grown Concentrates	2	-	-	-	15	-	-	1
Agistment	14	68	71	65	28	84	93	84
Vet & Meds	34	25	28	28	29	36	26	29
Other	14	19	13	15	17	22	18	19
Total	138	156	137	143	148	202	172	178
Gross Margin before Forage	1012	928	990	973	816	748	836	808
Forage Variable Costs								
Seeds	9	2	2	3	18	4	4	5
Fertilizer	39	21	21	23	56	26	27	30
Sprays	-	1	-	-	-	1	-	-
Total	48	24	23	26	74	31	31	35
Gross Margin after Forage	964	904	967	947	742	717	805	773
Direct Labour	152	147	93	115	n.a.			
Gross Margin after Forage and Labour	812	757	874	832	n.a.			

Table IIIB

Output, Variable Costs and Margins for Upland Flocks
Per 100 Ewes Put to the Ram

Flock Size	1973-74				1974-75			
	0-299	300-499	500+	All Flocks	0-299	300-499	500+	All Flocks
No. of Flocks	7	8	4	19	7	8	4	17
Average Flock Size	201	359	884	411	214	369	875	418
Enterprise Output	£	£	£	£	£	£	£	£
Lambs Sold - Fat	581	589	845	703	505	709	835	726
- Store	310	256	66	180	274	127	27	110
Lambs Retained								
- Breeding	306	187	183	206	213	133	172	166
- Store	23	10	53	32	12	6	21	14
Hill Sheep Subsidy	113	117	109	112	203	219	213	213
Wool	93	94	102	98	92	100	108	102
Total	1426	1250	1358	1331	1299	1294	1376	1331
Flock Maintenance	156	75	225	157	-39	45	115	60
Flock Output	1582	1325	1583	1488	1260	1339	1491	1391
Other Sheep Output	18	28	32	28	34	3	25	18
Total Sheep Output	1600	1325	1615	1516	1294	1342	1516	1409
Variable Costs								
Purchased Concentrates	164	38	72	76	191	58	69	88
Purchased Bulk Foods	-	1	10	5	-	1	-	1
Home Grown Concentrates	-	8	-	3	-	12	-	4
Agistment	24	3	80	42	2	2	74	33
Vet & Meds	51	38	54	48	55	27	38	37
Other	17	18	45	29	16	14	29	21
Total	256	106	261	203	264	114	210	184
Gross Margin before Forage	1344	1247	1354	1313	1030	1228	1300	1225
Forage Variable Costs								
Seeds	12	3	6	6	18	3	10	9
Fertilizer	64	52	64	60	61	41	58	53
Sprays	-	3	1	1	2	4	2	2
Total	76	58	71	67	81	48	70	64
Gross Margin after Forage	1268	1189	1283	1246	949	1180	1236	1161
Direct Labour	180	163	112	143	n.a.			
Gross Margin after Forage and Labour	1088	1026	1171	1103	n.a.			

Table IIIC

Lambing Rates, Disposals, Replacement Rates, Prices etc.for Hill Flocks

Flock Size	1973-74				1974-75			
	0-299	300-499	500+	All Flocks	0-299	300-499	500+	All Flocks
No. of Flocks	9	15	15	39	9	15	15	39
Average Flock Size	225	407	845	534	235	416	849	541
	Per 100 Ewes Put to Ram				Per 100 Ewes Put to Ram			
Lambs Born	98	99	97	98	88	95	94	94
Lambs Died	7	9	6	7	3	5	5	5
Lambs Reared	91	90	91	91	85	90	89	89
Lambs Sold - Fat	49	37	30	34	45	46	33	38
- Store	11	18	21	19	13	10	21	17
Lambs Retained								
- Breeding	26	32	34	33	23	32	33	32
- Store	5	3	6	5	4	2	2	2
Flock Mortality	6.1	4.5	3.5	4.1	7.6	5.4	5.5	5.7
Fat Ewes	1	3	4	4	4	9	2	4
Draft Ewes	16	21	22	21	12	14	22	18
Ewe Lambs (Transferred In)	25	29	31	30	23	30	32	31
Purchased Ewes	2	1	-	-	1	-	1	1
Replacement Rate	27	30	31	30	24	30	33	32
Lamb Mortality (% of births)	6.6	9.4	6.5	7.4	3.4	5.6	5.2	5.1
Disposal of Lambs per 100 Reared								
Lambs Sold - Fat	54	42	34	38	53	51	37	43
- Store	12	20	23	21	16	12	24	19
Lambs Retained								
- Breeding	28	36	37	36	27	35	37	36
- Store	6	2	6	5	4	2	2	2
Prices - £ per head								
Lambs - Fat	10.48	9.65	9.98	9.95	9.19	8.00	8.68	8.50
- Store	7.00	6.44	7.79	7.38	4.70	5.37	6.59	6.21
Ewes - Fat	4.70	6.02	9.03	7.81	3.43	3.97	4.82	4.13
- Draft	8.80	8.50	8.45	8.47	6.19	6.84	6.23	6.36
Purchased Store Lambs								
Number (per flock)	22	11	8	12	8	4	8	6
Purchase price per head (£)	4.83	7.96	6.53	6.32	3.59	6.19	5.31	5.05
Wool								
Weight per fleece (kilos)	1.74	1.91	2.13	2.03	1.79	2.03	2.24	2.13
Value per fleece (£)	0.74	0.84	0.91	0.87	0.80	0.94	1.00	0.96
Value per kilo (£)	0.43	0.44	0.43	0.43	0.45	0.46	0.45	0.45

Table IIID

Lamb Disposals, Replacement Rates, Prices etc.
Upland Flocks

Flock Size	1973-74				1974-75			
	0-299	300-499	500+	All Flocks	0-299	300-499	500+	All Flocks
No. of Flocks	7	8	4	19	7	8	4	19
Average Flock Size	201	359	884	411	214	369	875	418
	Per 100 Ewes Put to Ram				Per 100 Ewes Put to Ram			
Lambs Born	113	105	110	109	104	107	107	106
Lambs Died	4	6	4	5	2	4	4	3
Lambs Reared	109	99	106	104	102	103	103	103
Lambs Sold - Fat	50	49	69	58	49	69	76	68
- Store	28	25	7	17	29	14	3	12
Lambs Retained								
- Breeding	28	24	24	25	23	19	21	21
- Store	3	1	6	4	1	1	3	2
Flock Mortality	5.3	5.1	2.9	4.2	7.1	3.7	3.2	4.1
Fat Ewes	8	6	8	7	20	4	1	6
Draft Ewes	19	18	19	18	9	17	23	18
Ewe Lambs (Transferred in)	29	24	24	25	22	20	25	23
Purchased Ewes	8	7	4	6	13	8	10	10
Replacement Rate	37	31	28	31	35	28	35	33
Lamb Mortality (% of births)	3.8	6.5	3.4	4.6	1.5	4.0	3.7	3.4
Disposal of Lambs per 100 Reared								
Lambs Sold - Fat	46	49	65	56	48	67	74	66
- Store	25	25	6	16	28	14	3	12
Lambs Retained								
- Breeding	26	25	23	24	22	18	20	20
- Store	3	1	6	4	2	1	3	2
Prices - £ per head								
Lambs - Fat	11.56	12.23	12.16	12.09	10.20	10.34	10.95	10.62
- Store	11.26	10.26	10.49	10.59	9.59	8.88	9.34	9.25
Ewes - Fat	5.63	6.89	6.20	6.30	8.63	5.47	4.66	7.56
- Draft	17.53	11.57	18.95	16.07	13.35	7.69	11.24	10.21
Purchased Store Lambs								
Number (per flock)	14	29	86	36	14	8	21	13
Purchase price per head (£)	9.26	9.91	10.08	9.90	7.63	8.80	4.94	6.99
Wool								
Weight per fleece (kilos)	1.88	2.01	1.86	1.92	1.91	2.10	2.39	2.19
Value per fleece (£)	0.93	0.93	1.02	0.97	0.92	1.00	1.08	1.02
Value per kilo (£)	0.49	0.46	0.55	0.50	0.48	0.48	0.45	0.47

APPENDIX B

Terms and Definitions

Whole Farm Data

a) Total Output - the sum of all enterprise outputs plus miscellaneous output.

b) Livestock Variable Costs - all costs directly attributed to livestock enterprises. The main costs are purchased concentrates and bulk foods, agistment, vet fees and medicines, casual labour and contract work.

c) Forage Variable Costs - the cost of seeds, fertilizer and sprays applied to grazing and sowing land and to other fodder crop areas.

d) Fixed Costs - costs which cannot be allocated to a specific enterprise. These include regular labour, machinery including depreciation, rent and rates, and general overheads.

e) Management and Investment Income - arrived at by deducting all input costs from total farm enterprise output, and represents the reward for the farmers' and spouse's management and the interest on their tenant's capital.

f) Net Farm Income - management and investment income plus the value of the manual labour of the farmer and spouse.

g) Tenant's Capital - is the value of livestock, machinery, crops and stores. In these tables it is expressed as the average of the opening and closing valuations for these items.

Enterprise Outputs from:-

a) Beef Herd - revenue from calves sold plus the value of calves retained, hill cow and calf subsidies and house credits less herd depreciation (or plus, if appreciation) and the cost of calf replacements.

b) Other Beef Cattle - sales of cattle (not accounted for above) plus transfers to the beef herd and credits and closing valuation, less purchases and transfers from the beef herd and opening valuation.

c) Breeding Flock - revenue from lambs sold fat and store plus the value of lambs retained for breeding and store, hill sheep subsidy, wool and house credits less flock maintenance (or plus, if appreciation).

d) Total Sheep - flock output plus output from other sheep (e.g. sheep retained in the previous year or transfers out from the breeding flock).

Enterprise Costs

a) Livestock Variable Costs - all costs attributable to a specific enterprise.

b) Forage Variable Costs - costs of seeds, fertilizers and sprays allocated to the appropriate enterprise according to the number of grazing values and consumption of fodder crops.

c) Direct Labour - cost of labour based on the hours spent on feeding and general management and allocated to the appropriate enterprise.

Margins

a) Gross Margin before Forage - total output less livestock variable costs.

b) Gross Margin after Forage - total output less livestock and forage variable costs.

c) Gross Margin after Forage and Labour - total output less livestock and forage variable costs and direct labour.

Herd and Flock Maintenance

a) Herd maintenance is the difference between the opening valuation of the breeding herd plus cows purchased and heifers transferred in and the closing valuation of the breeding herd plus cows sold.

b) Similarly flock maintenance is the difference between the opening valuation plus purchases and transfers in and the closing valuation plus sales.

Livestock Units

The conversion factors used were as follows:-

Bulls	0.8
Beef Cows	0.6
Suckler Calves	0.2
Heifers in Calf	0.8
Other Cattle - 1yr & over	0.8
- 1-2yrs	0.6
- Under 1yr	0.4
Rams	0.1
Breeding Ewes	0.1

APPENDIX C

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