Sheep - Cost of production
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THE WEST OF SCOTLAND AGRICULTURAL COLLEGE

SHEEP IN SHEDS

Some Farmers' Experiences in Season 1963-64

J.B. McCreath

178 Bothwell Street,
Glasgow, C. 2.

Economics Department Report No. 97
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INTRODUCTION

Within recent years the possibilities of wintering and fattening sheep in sheds has created a good deal of interest. The practice is not entirely new. In certain regions ewe hoggs have been over-wintered indoors at different periods in the past. In parts of the Pennines and in the Lake District hogg houses are fairly common although not generally in use as such to-day. The reasons why the system was evolved and then discontinued would make an interesting study in itself.

In contrast to the renewed interest at the present time, it is very doubtful whether economic considerations underlay the housing of hoggs. It is suggested, rather, that animal health was the prime motivation. Certainly, this was the case in Skye where, in the early years of this century, hoggs were housed overnight in frosty weather. They were not turned out for the day until the hoar frost had lifted. The discovery of an effective preventative for braxy made the practice unnecessary.

The fattening of hill lambs in sheds is a new technique and the reasons here are solely economic.

This report deals with the costs and results of seven hogg wintering trials and the costs and returns of three hogg fattening trials on ordinary commercial farms. It is presented in case study form as averages in a study of this kind would be most misleading.

Organisation and Method

The report is the outcome of close co-operation between the farmers and members of staff of the College Advisory Service and the Economics Department. The county advisers selected the sample, kept in touch with the trials over the season and checked the monthly recording sheets. The results were calculated by the Economics Department. Each farm was visited by the author, usually accompanied by the county adviser. Drafts of the results and comments thereon were submitted to each co-operator before finalising and these, amended where necessary, are as printed. The conclusions drawn in the first section of the report are the responsibility of the author.

COSTING METHOD AND TERMS

The costing period was the number of feeding days in the shed. Purchased feed was charged at the cost delivered to the farm, home grown feed at values representing average costs of production, namely

Oats @ 22/- per cwt. if bruised; 20/- where sent to a merchant for cubing.
Barley @ 22/- per cwt.
Hay @ 9/- per cwt.
Silage @ 3/- per cwt.

Farmer's manual work and hired labour were charged at the same rate, 5/6d per hour, in all cases. The hours are for direct attendance on feeding etc. The time spent on observation, which can be considerable but well worthwhile in the early stages, has not been included on the grounds that this is a management function. This obviates the need to charge time spent visiting away-wintered hoggs in any "shed versus away" comparison.

Tractor hours, at 4/3d, are for time spent hauling feed to shed. There were few cases as on most farms fodder was either in or adjoining the shed.

As full details are given in each case study only three points need be mentioned regarding sheds.

1. No charge was made for interest on capital invested in the only new shed in this study. For the farmer contemplating shed wintering who has not got a house suitable for adaption, this would be an important consideration. On the other hand no allowance has been made for the saving in time and convenience of a combined wintering and sheep handling shed. The prime purpose of such a shed, however, is hogg housing and on this premise no credit was allowed for other uses.

2. The man and tractor hours required for cleaning out a shed between seasons can be considerable.

3. No credit has been allowed for the manurial value of the litter. Evidence was led in only one instance that this type of dung was useful.

No allowance was made for a share of general farm overheads nor for grazing prior to housing. Thus, in the hogg fattening section the term Profit - or Loss - differs from its usual meaning to that extent. On the grounds of equity in any comparison between home and away costs hoggs wintered in the shed should bear a share of overheads whereas, undoubtedly, away-winterers do not.

Of more consequence, however, is the value put on grazing from 1st October until the hoggs go into the shed. Where comment is made in the case studies on this point, this has been deliberately charged at only 6d per head per week. It is perhaps not far off the mark for open hill but is too low for improved in-bye land or lowground fields. For these, 1/- might be more realistic. A wintering charge of 40/- for six months on a dairy or arable farm is equivalent to 1/6d per week.

Acknowledgements

This study is the result of a joint attempt to obtain detailed information on one of "the growing points" in hill farming to-day. Grateful acknowledgement is tendered herewith to the farmers listed below. Special mention is made of the willingness of all co-operators to have their results go forward under their own names. This makes the study more valuable for those who may be contemplating shed sheep.

Brigadier I.M. Stewart, Achnacone, Appin. Colonel P.S. Sandilands, Lagganbeg, Kilninver. Messrs. Bain and McInnes, Ferlochan, Benderloch.	North Argyll
Mr. A. McKenzie, Manager, Ormsary Estate, Lochgilphead.	South Argyll
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Mr. J.B. Greenshields, Goosehill, Sanquhar. Mr. A. Barr, East Skelston, Dunscore. Mr. P.M. Gordon, The Grange, Tundergarth, Lockerbie.	Dumfriesshire

The author is also indebted to the following colleagues on the county staff:- A. McLeod and W. Lyons, Oban; S.A. Ross, Campbeltown; R.N.Gentles, Dunoon and A. Campbell, Dumfries.

Conclusions

It would be unwise to draw many conclusions from such a small sample. The following appear to the writer to be relevant to general conditions.

Hogg Wintering

1. Where a new shed has to be built, the cost of shed wintering over an equal time period in a season is dearer than away-wintering when all factors are taken into account.

2. Where a building can be easily adapted, there is a chance of shed wintering being less expensive but the margin in favour is not as high as is often claimed.

3. In either case, if hay has to be purchased, then, at the present price levels for hay, the shed system is much more expensive.

4. One of the main factors is the length of time hoggs have to be housed. In an early hard winter the costs will be much higher than in a mild season.

5. Most important of all, the costsshould never be isolated from the results pertaining on a particular farm.

6. Shed wintering is more expensive than outdoor wintering on the hill but it offers many technical advantages, not least of which is the chance to increase the size of the breeding flock if conditions warrant it.

7. Given careful management the death rate is very low.

8. It does not always follow that hoggs which do well in the shed will do equally well as breeding sheep.

9. Given careful management shed wintering offers a useful alternative to the existing traditional methods.

Hogg Fattening

There is such variation even between individual lambs in the same batch that general conclusions are not permissible. The following are interesting points which arise from the three cases of hogg fattening.

1. Gradual introduction to the shed environment and to feeding is crucial.

2. More information is required on the optimum level of concentrate feeding, particularly for barley rations, in relation to live weight gain.

3. Lighter lambs in this study appear to be more profitable than heavy lambs.

4. In certain areas lack of an outlet for small consignments of fat hoggs may be a deterrent to the wider adoption of the system.

5. Apart from the results of hogg fattening itself, the system offers possibilities in the wider context of more intensive sheep husbandry on the lowground.

In conclusion it must be stressed that the cost aspect in either system must not be considered in isolation.

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ORMSARY ESTATE

The 458 hoggs costed are part of the flock replacement required for this large hill sheep unit carrying some 4,000 pure Blackface ewes and 150 hill cows. Season 1963-64 was the second occasion on which hoggs were wintered indoors.

Housing

The shed, constructed by estate staff with home grown timber, combines the most modern ideas for hogg wintering and sheep handling. Clipping and dipping can now be done under cover. The top floor of the three-tier building is used for food storage. The roof serves as a catchment area for the water tank. The floors are not slatted. Sawdust was used as litter and was completely satisfactory.

The net cost after deducting a one-third grant was in the region of £2,500. To allow for annual repairs and replacement, this cost was spread over 50 years giving a net cost per hogg housed of 2/3d per season. This is considerably cheaper than it would have been had the shed been built by contract.

The lambs, which return to their own hirsels after speaning, came into the shed on the 1st December. The average live weight of a sample batch was 61 lb. per head. They averaged 65 lb. out of the shed on 31st March, a gain of 6½% or fractionally under ¼ lb. per week.

Feeding and Veterinary Aspects

The daily ration was 6 oz. of proprietary ewe hogg pencils and 1½ lb. of purchased hay. Feeding took about 2 hours per day. There were no noticeable digestive disorders. The hoggs were vaccinated for braxy and louping ill and drenched for worms. There was no trouble from either foot rot or pneumonia. There were only six casualties during the housing period or a death rate of 1.3%.

Costs and Charges

	Total	Per Hogg
Purchased Feed		
181 cwt. concentrates @ 35/- per cwt.	£316:15:-	£-:14:-
724 " hay @ 16/9 " "	606: 7:-	1: 6:10
Home Grown Feed Nil	-: -: -	-: -: -
TOTAL FEED COSTS	923: 2:-	2: -:10
Sundry Livestock Expenses	17: 3:-	-: -: 9
Labour (244 hrs. @ 5/6d)	67: 2:-	-: 3:-
Tractor (4 hrs. @ 4/3)	-:17:-	neg.
Capital Loss (deaths)	30:10:-	-: 1: 4
Shed Charges (Annual Share of Net Cost)	50: -:-	-: 2: 3
TOTAL COSTS AND CHARGES	£1088: 4:-	£2: 8: 2

Number of Feeding Days		122
Total Costs excluding labour	=	45/- (per hogg)
Feed Costs per Hogg per Week	=	2/4
All " " " " "	=	2/7 (excluding labour)

In view of the fact that the hoggs were only in-wintered for four months, it is clear that in this case shed wintering was much more expensive than away-wintering, even after excluding labour costs. Away-wintering, for the normal six month period from 1st October at 40/- plus 5/- say for haulage costs 1/9 per week. There is no satisfactory way of calculating what two extra months on the hill costs in real terms but even at only 6d per week it brings the total cost per hogg to 52/- or 49/- excluding labour. Recent away-wintering charges for this unit varied from 40/- to 45/- plus haulage by estate float.

The main factor in the high cost was purchased hay. Had the hay been home grown the cost of the hay ration would have been 14/5; reducing the total cost to around 36/- per hogg. At the time of writing the hoggs had not been clipped but were in good fettle. In view of the experience with the 1962-63 in-wintered hoggs as gimmers this Spring, the 1965 lambing is awaited with some anxiety.

Season 1962-63

Some 450 hoggs, fed on an identical ration of ewe hogg pencils and hay, were wintered in the newly constructed shed. They came out of the shed in the desired condition. At clipping time the fleece weight was no different from that achieved in previous seasons by away-wintered hoggs. They came to the tup in 1963 in good order as evidenced by the low eild count. But, by the time of the Spring dipping this year it was obvious that these shed wintered sheep had had a severe check during pregnancy. So poor were they in condition that they were kept on in-bye land and hand fed with ewe nuts. They responded to feed but lambing was difficult and in many cases gimmers' lambs had to be twinned on to ewes. Even tup eild gimmers were listless. Only supplementary feeding prevented a disaster.

Such a situation called for a thorough investigation. Veterinarians from the concentrate suppliers, a private practitioner and members of the College Veterinary and Advisory Services were consulted. A worm count revealed no abnormal worm burden. As yet no final nor unanimous conclusion has been reached.

It is not for the writer to draw conclusions in this particular case. Suffice it to say that it drives home the point that, although in-wintered hoggs may do well as hoggs, it does not always follow that they will do well later as breeding sheep.

The real test will come next spring when this year's hoggs, identically wintered, come to lamb. The serious matter of whether or not this year's gimmers have fully recovered will also be resolved then.

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LAGGANBEG, KILNINVER

Lagganbeg carries 560 pure Blackface ewes, 80 cast ewes for crossing and 21 hill cows on 1760 acres, only 60 of which are lowground. Prior to last winter the practice was to send the majority of the hoggs to wintering; the remainder being wintered on the lowground.

This season 85 hoggs were moved from the hill to in-bye grazing in November where they were held until housed in mid January.

Housing

The 'but-of-pocket" costs of adapting a deep litter poultry house was £50. Peat moss and lime were used as litter. It is estimated that cleaning out the house will take 16 man hours and 4 tractor hours.

Feeding and Veterinary Aspects

The concentrate ration, three parts bruised oats and one part ewe pencils, was introduced gradually and tailed off prior to the hoggs returning to the hill. The daily consumption averaged over the whole period was between 4 and 5 oz. per head. Home grown meadow hay was fed throughout at 1 lb. per head. The farmer would have preferred to keep the hoggs in later than 3rd April but the meadow hay supply was finished. They did not take readily to purchased carse hay which was offered. The hoggs continued to get a little concentrate for a fortnight before returning to their hirsels on 17th April.

The hoggs were vaccinated against pneumonia and dosed for worms in March when some were observed to be "wormy". Careful attention was paid to foot condition. There were five casualties (5.9%) during the housed period. The cause of death was different in each case. There was no pneumonia.

Costs and Charges

	Total	Per Hogg
Purchased Feed (22⅕ cwt. concentrates)	£33: 2: -	-: 8: 3
Home Grown Feed (60 cwt. hay)	27: -: -	-: 6: 9
TOTAL FEED COSTS	60: 2: -	-:15: -
Sundry Livestock Expenses	9: -: -	-: 2: 3
Labour (74 hours @ 5/6)	20: 7: -	-: 5: 1
Tractor	-:10: -	-: -: 1
Shed Charges (Annual Share)	2:10: -	-: -: 8
" Cleaning)	5: 5: -	-: 1: 4
Capital Loss (due to 5 deaths)	25: -: -	-: 6: 3
TOTAL COSTS and CHARGES	£122:14: -	£1:10: 8

Number of Feeding Days		80
Total Costs excluding labour	=	25/7
Feed Costs per Hogg per Week	=	1/3
Total Costs " " " "	=	2/3 (excluding labour)

The hoggs were not weighed but the farmer was convinced that they had gained in weight. In general he was pleased with their condition but there were wide variations between individuals. As this was the first season, no comparison can be made on their subsequent performance.

The data on away-wintered hoggs are given below.

Season	District	Death Rate	Charge	Haulage	Total per Week
1962-63	Fife	4%	38/-	4/-	1/7
1961-62	"	8½%	38/-	4/6	1/8

The 1962-63 winterers did very well as gimmers this spring in contrast to the general experience on many hill farms of gimmers being very short of milk.

In this instance, assuming the weekly cost of grazing outside at 6d per head for 15 weeks, the inclusive cost of the shed wintering method (38/-) was 6/- per head cheaper than away wintering including vaccines; 11/- cheaper if labour is omitted.

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STRONCHULLIN, BLAIRMORE

Stronchullin is a small hill farm carrying some 350 Blackface ewes. There is also a poultry unit. 1963-64 was the third season of shed wintering. Previously, the hoggs had been wintered on the hill.

Housing

The hoggs were housed in a converted Dutch barn. The sides were partially clad with corrugated iron and half of the floor area was slatted. Water bowls were installed. The total "out-of-pocket" cost of conversion including feeding boxes was in the region of £120 of which £52 was for wooden slats. For costing purposes this was spread over 20 years.

Feeding and Veterinary Aspects

The hoggs were weighed on 6th December and were divided into two groups; 50 to be fed hay as the roughage and 58 on silage. The silage group was on the slatted area. For the first two months the concentrate ration was 65% oats, 30% beet pulp and 5% fish meal; in the third month, whole maize only and in the last month 55% maize, 40% beet pulp and 5% fish meal. Throughout, both groups were allowed the same quantity of concentrates per head, starting at approximately 1½ oz. and finishing at 4 oz. per day. Daily hay consumption averaged 1½ lb. and silage, 4 lb. per head.

Over the 124 day feeding period, the hay group gained 3½ lb. per head whereas the silage group lost 2½ lb. per head. The average starting weight in each group was 56 lb.

There were no deaths in the hay group but seven of the hoggs (12%) on silage died. Five of these casualties were due to an accidental overdose of minerals in January which led to extreme scouring. The silage fed hoggs, although treated for scour, never made up for this check and hence the average loss in weight.

All hoggs went through the foot bath in December and again in February. There was no foot rot in either group, nor was there any pneumonia.

Costs and Charges

		Hay Group		Silage Group	
No. of Hoggs In		50		58	
" " " Out		50		51	
PER HOGG OUT					
Bought Feed		-: 6: 2		-: 8: 4	
Home Grown Feed		-:14: 5		-:13: 2	
TOTAL FEED COSTS		£1: -: 7		£1: 1: 6	
Sundry Livestock Expenses		-: -:10		-: 1: -	
Labour		-: 4:11		-: 5: 7	
Shed Costs					
Share of Conversion Costs	-: 8d		1: 8		
Cleaning	2:10	-: 3: 6	2:10	-: 4: 2	
Capital Loss (due to deaths)		-: -: -		-:13:11	(7 @ £5)
TOTAL COSTS		£1: 9:10		£2: 6: 2	

Number of Feeding Days	124	124
Average Feed Costs per Week	1/2d	1/3d
Total Costs per Week	1/8d	2/7d
" " " " ex. Labour	1/5d	2/3d
Live Weight Gain per Week	3.2 oz.	(-)2.3 oz.

Again the effect of death rate on the cost per hogg stands out. In this case the capital loss per hogg was the highest single item of cost, and the cost of concentrates was 2/2d per hogg higher. Had there been no deaths in the silage group the average total cost would have been virtually the same in each group i.e. 30/- per head.

The accidental overdose of minerals invalidates a proper inter-group comparison. The farmer, however, is of the opinion that hay fed hoggs are preferable to silage fed. Next season all will be wintered on hay unless the silage is of very high quality. In 1962-63 a silage fed group had to be put onto hay after one month due to excessive urinating. At that time there was no slatted area and the silage fed hoggs tended to become very dirty. The effect of the annual share of the slat costs is significant in the table.

In conclusion, shed wintering of hoggs over three seasons on this farm has been satisfactory. One of the main benefits has been an increase of 2½ score of ewes or 17% on the hill where previously the hoggs were out-wintered. Another benefit is the reduced death rate at the hogg stage. Formerly, 15 to 20 hoggs died or went missing in an adjoining forestry plantation.

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ARDACHEARNMORE, GLENDARUEL

This hill farm, carrying a Blackface flock of 350 ewes and 25 hill cows, extends to 1175 acres of which only 35 acres are lowground. Formerly, ewe hoggs were wintered on the hill.

Housing

A corrugated iron and wooden shed was constructed on the site of a disused fank. The stone walls form the lower sides of the shed. The construction was done by the farmer and his son. The "out-of-pocket" expenses for material amounted to £80. Sawdust was used as litter. The shed proved very satisfactory. A minor disadvantage was that water had to be carried, but this will be rectified next season.

Feeding and Veterinary Aspects

The concentrate ration was bruised oats, barley, whole maize, beet pulp and calf rearing cake in the ratio 8:4:1:1:1. The daily allowance was 5 oz. per head, plus 1½ lb. of home grown hay.

The only veterinary treatment was a louping ill vaccination. The hoggs were remarkably free from disease and there was only one death out of 85 hoggs housed (1.2%).

The hoggs went in on 1/12/63 and came out on 15/4/64; a feeding period of 136 days.

Costs and Charges

	Total	Per Hogg
Purchased Feed (24½ cwt. concentrates)	£29: 8: -	£-: 7: -
Home Grown Feed (136 cwt. hay)	61: 4: -	-:14: 7
TOTAL FEED COSTS	90:12: -	1: 1: 7
Sundry Livestock Expenses*	9: -: -	-: 3: 1
Labour (36 hours @ 5/6d)	9:18: -	-: 2: 4
Tractor (6 " " 4/3d)	1: 5: -	-: -: 4
Shed Charges (Annual share)	4: -: -	-: -:11
Capital Loss (1 death)	3: 5: -	-: -: 9
TOTAL COSTS and CHARGES	£118: -: -	£1: 9: -

* Vaccine, minerals and sawdust.

Number of Feeding Days		136
Total Costs excluding Labour	=	26/8
Feed Costs per Hogg per Week	=	1/2
Total " " " " "	=	1/6 (excluding labour)

On a per week basis this farm had the same costs as East Skelston and these were the joint lowest in the survey.

The lamb crop in 1963 was below average in numbers. Consequently, some ewe lambs which would have been culled in a normal season, were retained. The hoggs were not weighed but the farmer is convinced that they put on a satisfactory gain.

The cost of wintering in the shed was much more expensive than out-wintering on the hill but less expensive than away-wintering. The final result will depend on how the hoggs do as breeding sheep. It may be feasible to increase the size of the breeding flock in the future if conditions warrant it.

The farmer was very satisfied with the results and intends to in-winter in the future.

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EAST SKELSTON, DUNSCORE

This upland stock rearing farm - 70 acres of lowground and 260 acres of rough grazing - carries 220 Blackface ewes and 34 Galloway cows. Flock replacements are purchased as the lambs bred are Greyface Crosses.

The hoggs, costing 74/- per head and weighing 60 lb. (est.) went into the shed on 15th December and came out on 10th April. Only one died out of 56, a death rate of 1.8%.

Housing

Part of the steading was adapted for sheep. The total "out-of-pocket" expenses was £30. Sawdust was used as litter. There is no water in the shed. This is the only case in the study where hoggs went out daily. They were in an adjoining field for some two hours each day.

Feeding and Veterinary Aspects

Home grown oats were sent to a merchant for cubing with a protein concentrate. The daily ration was 5 oz. of concentrate and 1 lb. of home grown hay per head. The number of feeding days, as distinct from shed days, was 112. The hoggs wers dosed twice as a precaution against worms and vaccinated thrice with anti-pneumonia vaccine. There were no disease problems. The hoggs thrived well and the estimated liveweight gain was 5 lb. per head.

Costs and Charges

In the following table the constituents of the concentrate ration have been costed separately.

	Total	Per Hogg
Purchased Feed (14 cwts. @ 29/-)	£20: 6: -	-: 7: 4
Home Grown Feed (6 cwt. oats @ 20/-)	6: -: -	-: 2: 2
(56 cwt. hay @ 9/-)	25: 4: -	-: 9: 2
TOTAL FEED COSTS	51:10: -	-:18: 8
Sundry Livestock Expenses	9: 9: -	-: 3: 5
Labour (46 hours @ 5/6d)	12:13: -	-: 4: 7
Shed Charges (annual share)	1:10: -	-: -: 8
Capital Loss (1 death)	3:14: -	-: 1: 4
TOTAL COSTS and CHARGES	£78:16: -	£1: 8: 8

Number of Feeding Days	112
Total Costs excluding Labour	24/1
Feed Costs per Hogg per Week	1/2
Total " " " " "	1/6 (excluding labour)

Excluding labour, the hoggs on this farm had the same feed and total costs per hogg per week as those at Ardachearnmore. These two farms had the lowest costs per week of the seven farms in the study. There was an average liveweight gain of 5 lb. or 8½%. This represents an average gain of ⅓ lb. per week and a conversion ratio of 8:1.

At East Skelston shed wintering was considerably cheaper than average away-wintering costs.

In-wintering was started in season 1962-63. These hoggs had their first lamb crop this spring. There were only eight eild gimmers out of 50. They were stronger than their out-wintered "sisters" were in 1963 despite the more inclement conditions this spring. As an indication the lambing count for the whole flock in 1964 was lower than in 1963.

In earlier seasons hoggs were on lowground grass and were given 1 lb. of hay per day. Normally 1 cwt. was allowed for the hand feeding period. Thus the cost of feed and veterinary treatments would be in the order of 10/- per hogg. If the grazing is valued at 6d per week the all-in-cost for out-wintering for sixteen weeks would be 18/-, only 6/- less than shed wintering if labour costs are excluded. It is not surprising that the farmer is well satisfied with shed wintering in his particular situation.

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THE GRANGE, TUNDERGARTH

The Grange is an upland stock rearing farm - 160 acres of lowground and 626 acres of rough grazing - carrying 500 Blackface ewes and 50 Galloway cows. The ewes are put to Blue Face Leicester rams and almost all replacements are purchased. This season, 92 lambs were bought and 19 were home bred. They went into the shed on 22nd November and came out on the 5th April. Two died and one was sold during the 136 day period.

Housing

Three bays of a Dutch hay barn were converted into a suitable sheep shed. The shed was on a slope and excavation was required. A ramp was constructed. Wooden slats were installed at a sufficient height to allow room for removal of dung. Water was also laid on. Most of the work was done by farm staff and this cost has not been included. The total "out-of-pocket" expenditure was £240. For costing purposes £180 was charged against sheep and spread over 20 years. Apart from occasional freezing of the water bowls, the shed has proved very satisfactory. Cleaning the shed was estimated to take a day with one man and a tractor.

Feeding and Veterinary Aspects

The daily ration was ½ lb. of concentrate and 1¼ lb. home grown hay. The constituents were maize, flaked barley, bruised oats, locust bean meal and fish meal with minerals incorporated.

The hoggs were vaccinated against pneumonia and drenched for worms. They also received a Vitamin D vaccine. From a health aspect there was no noticeable trouble. The death rate was 1.8%. The farmer was disappointed, however, with the general lack of growth. Although the hoggs were not weighed, he was of the opinion that they had not gained significantly in weight over the season.

Costs and Charges

	Total	Per Hogg
Purchased Feed (65 cwt. concentrates)	£90:10: -	-:16: 9
Home Grown Feed (160 cwt. hay)	72: -: -	-:13: 4
TOTAL FEED COSTS	162:10: -	£1:10: 1
Sundry Livestock Expenses	9:14: -	-: 1: 9
Labour (68 hours @ 5/6d)	18:14: -	-: 3: 6
Shed Charges (Annual share of conversion)	9: -: -	-: 1: 8
(Annual cleaning)	4: -: -	-: -: 9
Capital Loss* (due to deaths)	4:10: -	-: -:10
TOTAL COSTS and CHARGES	£208: 8: -	£1:18: 7

* Allowing for one sold.

Number of Feeding Days		136
Total Costs excluding labour	=	35/1
Feed Costs per Hogg per Week	=	1/6
Total " " " " "	=	1/10 (excluding labour)

This was the first season of in-wintering. Formerly the hoggs went to a low-ground farm from mid October to 1st April. In 1962-63 the charge was 41/- per head plus 1/4 for haulage. Two hoggs died. The veterinary costs were 1/- per head less as no pneumonia vaccine was given. Excluding time and travelling costs to visit the hoggs once a month, the average cost per week in season 1962-63 including medicines was 1/9d per hogg as against 1/10d in the shed excluding labour. In addition there would be some cost for the three weeks in the autumn before the hoggs were housed. Again it is clear that shed wintering was no cheaper. It remains to be seen whether the shed wintered hoggs will do as well or better as breeding ewes. It is the practice at Grange to hand feed the ewe flock from mid February to lambing. There should be no trouble in getting the gimmers to eat next spring.

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ACHNACONE, APPIN

The hill at Achnacone is typical of many of the poorer type grazings in Appin and elsewhere in Argyll. It extends to 2175 acres, 75 of which have been improved with lime and slag, and the lowground to 35 acres. The breeding stock comprises 400 pure Blackface ewes, 130 cast ewes for crossing and 50 hill cows. There are very few commercial farms in the country where so much effort has been usefully devoted in finding the optimum system of in-wintering ewe hoggs in relation to their subsequent breeding performance on the hill.

In co-operation with the College Adviser for North Argyll, the first trial was undertaken in 1957-58 and continued for the next four seasons. A complete breeding cycle has been observed from in-wintering as hoggs to casting as ewes. A final report* was issued in 1963.

Housing

A well ventilated, concrete-floored shed, formerly used as a piggery, was available. In the first season raised slats were installed in some pens. The remainder were bedded with sawdust and a little hydrated lime. Slats were found to be unnecessary at a spacing per hogg of not less than twelve square feet. This could be reduced in a drier climate. In the next four seasons some six hundred hoggs in all were wintered on the solid floor without any foot troubles.

Feeding

Several types and weights of ration were tried. The most satisfactory scale has been hay or silage ad lib. plus ½ lb. of a "concentrate" of two parts crushed oats, (or similar cereal) two parts maize meal and one part decorticated groundnut meal with mineral and vitamin additive.

Type and quality of hay was a significant factor. Meadow hay was eaten more readily than good quality "commercial" hay. On many hill farms good meadow hay is often in short supply as it is at Achnacone. The ration than has been ½ lb. of hay; ½ lb. of concentrate and ½ lb. of beet pulp fed dry. Beet pulp proved helpful in countering digestive disturbances which an imbalance between roughage and concentrate may cause.

The above rations give an average liveweight gain of approximately ¾ lb. per head per week. The aim is to get a liveweight increase during housing of around 10 lb. which is considered the optimum condition for the quality of hill grazing on this farm.

* Field Trials and Demonstrations, 1962. West of Scotland Agricultural College, March 1963.

Fish meal, partly to replace groundnut meal, seems advantageous. The practical mineral need of the ewe hogg is above the theoretical.

A general and serious health upset always occurs if the "concentrate" is not introduced very gradually. It is now started at 2 oz. per day and stepped up appropriately throughout the season to a peak of some 14 oz. then tailed off prior to turning the hoggs out. The above figure of ½ lb. is the weighted average over the feeding period.

Introduction to the shed environment was carefully managed as was conditioning for the return to the hill.

Veterinary Aspects

The health of the hoggs has been remarkably good. Each season the death rate was well under 2%. Routine anthelmintic control is practised and precautions taken to ensure that hoggs are free of foot rot infection prior to housing. The hoggs are vaccinated against louping ill but not against pneumonia. Only two of three isolated cases of pneumonia were recorded during the trials.

Technical Advantages

The risks of a bad winter are eliminated. The death rate at the hogg stage is much lower than that of hoggs wintered on the hill. By altering the scale of feeding, hoggs can be grown to a size suitable for the particular hill and when numbers are short, small hoggs can be made into better gimmers than by normal out-wintering methods. A higher proportion of ewes can be drafted at five years instead of at six.

There is no significant difference in the behaviour pattern from that of ewes out-wintered as hoggs. No difficult "teaching" period is required if the flock has to be hand fed during hard weather.

In the spring the timing of release to hill can be regulated depending on the season. Hoggs are not dumped on the hill on 1st April when grazing for ewes is in short supply.

The general aim has been higher production from the existing ewe numbers rather than an increase in the breeding flock size.

Costs and Charges

This depends on the length of the feeding period. At the level of ration stated earlier, cost of feed for a period of 4½ months would amount to 28/- to 30/- per hogg or 1/7d per week approximately. Labour, shed charges and the cost of any outdoor grazing would have to be added before a true comparison could be made with away-wintering costs.

For the present study, costs were available for 1963-64 and partial costs for the previous season. This winter, medium quality silage was fed instead of hay. The approximate daily consumption was 3 lb. per head. The reason for the five-week shorter period in the shed in 1963-64 was that the hoggs were held on inbye land whereas the previous season they were housed straight off the hill.

	1963-64		1962-63	
No. of Hoggs Out	108		92	
Housed	22/1/64		10/12/62	
Out	20/4/64		13/ 4/63	
No. of Feeding Days	90		124	
Average Cost per Hogg Out				
Purchased Feed (59 lb.)	£-:16: 4	(76 lb.)	£1: -: 4	
Home Grown Feed (2⅓ cwt. silage)	-: 7: -	(1 cwt. hay)	-: 9: -	
TOTAL FEED COST	1: 3: 4		1: 9: 4	
Sundry Livestock Expenses (a)	-: 4: 8		-: 4: 8	(c)
Labour	-: 4: -		-: 3: -	
Shed Charges (b)	-: 1: 2		-: 1: 2	
Capital Loss (2 deaths @ £5 p.h.)	-: 1:10		-: 1:10	(c)
TOTAL COSTS and CHARGES	£1:15: -		£2: -: -	
Total Costs excluding labour	31/-		37/-	
Cost of Feed per Week	1/10d		1/9d	
Total Costs per Week	2/9d		2/3d	
" " " " (excluding labour)	2/3d		2/1d	

(a) Two vaccinations, worm dosing and cobalt bullet.

(b) Cost of conversion was not significant but 2d per hogg has been allowed. Cleaning shed between seasons was estimated at 1/- per hogg.

(c) Assumed to be the same as this season.

Over an equal time period the cost of feed on the hay ration was slightly cheaper and 6d per week cheaper when all costs were included.

The normal duration of away-wintering is 26 weeks. Charging grazing at 6d per week from 1st October until the hoggs were housed increases the total inclusive cost to 42/- per hogg in 1963-64 and 44/6 in 1962-63. Excluding labour the equivalent figures are 38/- and 41/6d. Assuming an away-wintering charge of 38/-, haulage at 4/- and veterinary precautions as above at 4/8d, it would appear that the shed wintering system was cheaper each season. The difference was not great, however, and it is clear that, if hoggs had to be housed four weeks earlier, say by 10th November due to hard weather, the extra cost of feed alone (7/-) would eliminate the margin.

This presupposes, however, that away-wintered hoggs would have the same death rate and that they would be in similar condition when they came home on 1st April. This is the kernal of the matter! In this respect it is the author's opinion that the flexibility of the shed method as practised on this farm outweighs any slight extra cost. There is no profit in saving 5/- at the hogg stage if it means a poorer breeding sheep for the next five seasons.

Brigadier Stewart's summation of his experiences over seven years is given verbatim.

"The results are similar to those expected from well out-wintered hoggs of comparable type and there has been no significant difference in their behaviour as breeding sheep.

The stock has improved in every way but it was poor at the start.

It is not claimed that the method is superior to good out-door wintering, only that it offers an alternative."

Shed fattening of Blackface lambs has also been under observation for the past three seasons. In view of the amount of data involved, it was decided to publish a final report on these trials as a separate paper which is in course of preparation

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GOOSEHILL, SANQUHAR

Goosehill is a stock rearing farm of 300 acres of which 70 acres are rough grazings. The stock carry is 300 Greyface ewes producing Suffolk cross lambs and 62 beef cows.

The 58 lambs, housed on 16/10/63, were the poorest of the lamb crop. They would not have been economically saleable at that time. They were born in March and April, speaned in September and grazed on hay aftermath until going into the shed. They had never been hand fed.

Housing

The lambs were housed in two converted byres. The demolition of the stalls was done by farm staff and such cost has been excluded. The total "out-of-pocket" cost of conversion was £60 approximately. To cover occasional repairs and renewal of wood this sum was spread over 20 years in the costings. Hay was fed outdoors twice a day on a concrete forecourt. Time for feeding and cleaning the concrete area accounts for the rather high figures of man and tractor hours.

Feeding and Veterinary Aspects

It must be emphasised that this was the first season and was, to that extent, experimental. The ration was bruised barley with fish meal and hay. The per head allowance of concentrate varied over time but hay was always ad lib. For the first two days the lambs got good quality hay which they ate readily. On the next two days they were offered ¼lb. of barley per head. The lambs appeared to prefer the hay. Subsequently they were allowed free access to barley in self-feed hoppers inside the sheds. By the end of the first week a number of lambs were scouring badly and after the first death, barley was discontinued on veterinary advice. Effected animals continued to die for a week after the barley was withdrawn. In all, seven died in the first fortnight. Post mortem findings indicated severe digestive disorders due to excess barley consumption. A possible contributory factor was some slight heating of the home-grown barley in the hoppers. Over the whole feeding period there were eleven deaths, eight of which were definitely due to digestive causes.

Following the setback, a number of lambs were given a proprietary urea additive with their hay. There was no significant increase in the consumption of hay and the lambs appeared to lose weight. Hard hay stems were not eaten. After a few weeks this trial feeding was discontinued and those lambs were put back gradually on to the same limited barley intake as the others. The top daily allowance of barley was around 1½ lb. per head

Other veterinary treatments are listed in the costs table. There were no foot-rot problems on the sawdust litter.

Stock Numbers and Output

IN			OUT		
(16/10/63)	58 @ 81/- p.h.	£234:18:-	(15/1/64)	31 sold	£233: 1:11
	GROSS OUTPUT	129:12:11	(3/3/64)	16 "	131: 9:-
		£364:10:11		47	£364:10:11

The average weight of a random sample of 13 was 81 lb. valued at 1/- per lb. The fat hoggs were sold on the farm to the meat trade. The average prices including deficiency payment for the two batches were 150/4 and 164/4 per head respectively. The death rate was 19.0%.

Costs and Charges

In the following table the per hogg divisor is the number which survived. Thus the cost of inputs to the date of death for those which died is included.

Costs and Charges

		Total	Per Hogg
Purchased Feed	(7 cwt. Fish Meal)	£24: 7: -	£-:10: 4
Home Grown Feed	(46 " Barley @ 22/-)	50:12: -	1: 1: 6
	(65 " Hay @ 9/-)	29: 5: -	-:12: 6
TOTAL FEED COSTS		£104: 4: -	£2: 4: 4
Sundry Livestock Expenses			
Pulpy Kidney Vaccine	£1:13: -		
Thibenzole	3: 7: -		
Formalin	1:10: -		
Urea Supplement	-:10: -		
Litter	-:10: -	7:10: -	-: 3: 2
Labour (115 hours @ 5/6d p.h.)		31:13: -	-:13: 6
Tractor (13 " " 4/3d p.h.)		2:15: -	-: 1: 2
TOTAL DIRECT COSTS		146: 2: -	3: 2: 2
Shed Charges			
Annual Share of Conversion Costs	£3: -: -		
Cleaning	3: -: -	6: -: -	-: 2: 6
TOTAL COSTS AND CHARGES		£152: 2: -	£3: 4: 8
GROSS OUTPUT		£129:13: -	£2:15: 2
LOSS		£ 22: 9: -	-: 9: 6

After charging all expenditure there was a loss of 9/6d per hogg fattened. If labour costs were omitted on the grounds that the wage bill was unaffected by the presence of hoggs, there would be a profit of 4/- per hogg.

Performance of Sale Batches

From the record sheets and sample weighings it was possible to make a fairly close assessment of the performance of the two sale batches, assuming that the average daily consumption of feed per hogg was the same in each batch. The casualty hoggs and their cost have been excluded in this table.

	Batch I	Batch II
No. of Hoggs	31	16
Live Weight @ 16/10/63 (lb.)	86	76
" " at slaughter (lb.)	96 (15/1/64)	99 (3/3/64)
" " Gain (")	10	23
" " " (%)	12	30
Weight of Concentrates (lb.)	85	153
Conversion Ratio	8.5:1	6.6:1
No. of Feeding Days	92	140
Live Weight Gain per Week (lb.)	.76	1.15
Cost of Concentrates/lb. L.W.G.	2/2d	1/6d
Selling Price per lb. liveweight	1/7d	1/8d
" " " " deadweight	3/3d	3/5d
Killing Out Percentage	48	48
	PER HOGG	
Selling Price	150/4	164/4
Less O.V. @ 1/- per lb.	86/-	76/-
OUTPUT	64/4	88/4
Less Concentrate Cost	21/6	38/3
Balance over Concentrates	42/10	50/1
Less Hay	10/-	14/6
Balance over Feed Cost	32/10	35/7
Less Veterinary Costs	3/-	3/-
	29/10	32/7
Less Labour	11/1	17/11
	18/9	14/8
Less Shed Costs	2/6	2/6
PROFIT per Hogg	16/3	12/2

Comparing the two, the later sold batch did much better technically and better financially up to the point of charging labour. They went into the shed 10 lb. lighter and came out 3 lb. heavier after a seven weeks longer feeding period. The live weight gain per week was over 1 lb. compared to $\frac{3}{4}$ lb. They fetched 2d a lb. dead weight more than the January sold batch. It is generally said that heavier lambs feeding alongside lighter lambs will consume more food daily. If this be so, then, because of the original assumption, the foregoing results are weighted in favour of batch I.

Perhaps the most interesting point about the figures for both groups is that the surviving hoggs did leave a profit in view of the severe checks to growth rate early in the feeding period. In other words the death rate, and inputs up to the date of death, have a very important bearing in the final financial result of the whole trial. The total cost of the 11 dead sheep @ 81/- p.h. plus some £13 for concentrates and hay was in the region of £58-more than sufficient to wipe out the profit margin on the hoggs which were sold.

Weight Data

The following table summarises the weight of the random sample of 13 hoggs.

Date:-	16/10/63	1/11/63	30/11/63	3/1/64
Average Weight (lb.)	81	83	89	93
Range (lb.)	54 - 106	57 - 111	67 - 112	74 - 113
No. which lost weight between weighings	-	4	1	4

Only 1 hogg (98 lb.) lost weight (6 lb.) over the period from 16/10/63 to 3/1/64. Over the same period the 6 lightest hoggs at the beginning showed an average gain of 25%; the 7 heaviest only 8%.

lb.	6 Light Hoggs	7 Heavy Hoggs
Average Weight on 16/10/63	67	93
" " " 3/1/64	84	100
" " Gain	17	7
Range in Gain	4 to 25	(-) 6 to 15
Average Gain per Week	1.49	.61

Although it was not possible to identify the weights of the sample lambs from the slaughter records, it is clear both from the sample weighings and the batch data that on this farm the lighter Down-cross hoggs did better.

Summary

If labour costs are included, there was an overall loss due to the heavy death rate. Ad lib feeding of barley early in the trial was the main reason for the loss. In view of the unfortunate feeding record, hoggs which survived did well. If labour costs are excluded, the lighter hoggs fed over a longer period were more profitable. Hay and urea additive alone was not a success. Many valuable lessons were learned from this, the first season of hogg fattening.

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SHALUNT, ROTHESAY

Shalunt is a stock rearing farm of 646 acres, of which 96 acres is lowground, at the eastern end of the Kyles of Bute. The numbers of stock carried are 260 Blackface ewes, 60 Greyface ewes and 60 hill cows.

Housing

On the 28th October, 31 shott Blackface lambs, average weight 54.3 lb., were brought into a court used for cattle and occasionally for pigs. The alterations needed for sheep were negligible. Sawdust was used as litter.

Feeding and Veterinary Aspects

The basic ration was bruised barley, oats, fattening nuts and a Rowatt supplement in the ratio of 8:2:4:1 by weight and $\frac{1}{4}$ to $\frac{1}{2}$ lb. of hay. The daily consumption of concentrates varied from 2/3 lb. to $1\frac{1}{3}$ lb. per head. Hay had to be rationed as it was found that at levels above $\frac{1}{2}$ lb. the hoggs tended to eat fewer concentrates.

During the 124 day period two hoggs died (6.4%), one from barley poisoning in the first month. As a consequence the daily allowance of concentrate was not increased until the third month of fattening. The farmer attributes the disappointing conversion ratios to this holding period. There was no trouble from foot rot or pneumonia.

Stock Numbers and Output

IN		OUT	
31 @ 50/- p.h.	£77:10:-	26 sold	£109:8:-≠
GROSS OUTPUT	44:10:-	3 retained @ 84/-	12:12:-
	£122:-:-		£122:-:-

≠ Net of commission and haulage.

The total direct costs were £63:10/- giving an overall loss of £19 or 13/1 per hogg. If labour costs are excluded the loss is reduced to 7/5 per hogg. The overall conversion ratio was 9:1. As the hoggs were sold in five different batches, however, the per hogg averages are of limited interest.

Performance by Batches

The following table summarises the five sale groups. Here the value and cost of the two casualties has been excluded.

Batch	Date of Sale	No. of Hoggs	No. of Days	Wt. In lb.	Wt. Out lb.	Wt. Gain lb.	Dead Wt.	Killing Out %
I	30/12	4	64	56	61	5	25	41
II	8/1	2	73	66	78	12	33	42
III	3/2	5	99	59	75	16	30	40
IV	17/2	6	113	55	71	16	28	39
V	7/3	9	132	50	65	15	28	43

Apart from batch II which was consigned to the slaughter house in Rothesay, the fat sheep were sold on the hoof in Paisley auction market. The difference between the live weight on the farm and at Paisley can be as high as 4 lb. per head. This loss of weight in transit is an important consideration for island producers.

Batch	I	II	III	IV	V
Live weight Gain per Week (lb.)	.55	1.15	1.13	.99	.80
Conversion Ratio	11:1	6:1	7:1	8:1	10:1
Average Selling Price*	85/2	113/5	98/9	68/8	80/-
Opening Value	50/-	60/-	50/-	50/-	45/-
Gross Output	35/2	53/5	48/9	18/8	35/-
Concentrate Cost	16/-	18/3	26/9	30/8	33/-
Balance over Concentrates	19/2	35/2	22/-	(-)12/-	2/-
No. of Hoggs	4	2	5	6	9
Total Balance	76/8	70/4	110/-	(-)72/-	18/-

* Net of haulage and commission but including deficiency payment. Group IV were sold on a day of sluggish demand.

It is clear from both tables that batch II and III were the most satisfactory on almost all counts; IV failed to cover concentrate costs and V did not leave a sufficient margin to cover fodder costs.

As in the previous case study, the wide variation in performance between hoggs of the same breed, of approximately the same age and fed on the same ration is most marked. The ability to convert a predominantly barley ration into mutton appears to be a highly individual function.

Although there was an overall loss in the shed fattening experiment of approximately £19, certain advantages accrued through having fewer hoggs on lowground grass in the winter. The Greyface flock had less competition from shott Blackface lambs. In 1963-64, 30 Blackface hoggs were kept outdoors 15 of which were graded in December at 94/- per head. The remainder went to "springing". In 1962-63 all shott hoggs (50 were kept outside and were supplementary fed in the spring and on 15th April went to hired grazing for two months at 6/- per head per month. They were not fit to grade until after clipping time. The selling price ranged from £5 to £8 per head.

In conclusion, although this first year's results were not good, the farmer is of the opinion that shed fattening has possibilities on his farm particularly in the wider context of lowground sheep husbandry.

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FERLOCHAN, BENDERLOCH

Ferlochan is a 400 acre stock rearing farm of which 60 acres is arable land. The breeding stock comprises 290 Blackface and Greyface ewes, 12 beef cows and a small poultry unit.

This was the first year in which hogg fattening was attempted. The 30 sheep involved were the "dregs" of the 1963 lamb crop. For the best, 45/- had been offered in November while the worst were probably not worth more than 10/- per head. An average value of 30/- per head has been assumed for these shott Blackfaces. The average weight was 45 lb.

Housing

A wooden lean-to poultry house with a solid floor was used. Water had to be carried. The litter was sawdust and hydrated lime. The shed cost £50 in 1963 and for costing purposes this was spread over 20 years and shared equally between poultry and sheep.

Feeding and Veterinary Aspects

From being housed on 20th December to the end of January the daily concentrate ration was approximately 1 lb. per head. The constituents were equal parts by weight of bruised oats, barley and wheat with 11% locust bean added; thereafter, 2 lb. per day of equal quantities of oats, barley and maize with 8% fish meal. Only a few bales of hay were consumed; not more than 2 cwt. in all.

Prior to housing the hoggs were dosed with Minel. No other veterinary precaution was taken. There was no pneumonia but minor foot complaints were noted. The major health factor was digestive imbalance. The introduction to concentrate feeding was not gradual enough and two of the 26 hoggs died in the second week. To counteract this setback the remainder were turned out during the day for a time. This access to a grass park was very beneficial and there was no further trouble. Four more hoggs were housed at the end of the second week. The overall death rate was 6.7%.

Output

IN			OUT		
(20/12/63)	30 @ 30/-	£45: -: -	(8/4/64)	21 sold store @ £5 p.h.	
	GROSS OUTPUT	81: -: -		5 " " "61/- "	£116: -: -*
				2 retained at £5 "	10: -: -
		£126: -: -			£126: -: -

* Net of commission and haulage (85/-)

The difficulties involved in selling small numbers of fat sheep in the Oban area were such that the farmer had to sell through the store ring. The average weight of the bigger lot was 81 lb. per head; the smaller, 62 lb. per head. The effect of this on the price received per head is very significant.

Assuming a 45% killing out percentage the average dead weight for the two groups would have been 36 lb. and 28 lb. respectively. The F.M.C. price per lb. for these weight groups on the week of sale was 3/7¾d and 3/8¾d for Grade A; Grade B, 2d less per lb. Assuming an overall average of 3/6d, the average fat price for the 21 heavier hoggs would have been 126/- or 26/- higher than the store price realised. For the 5 lighter hoggs the corresponding figures are 98/- and 37/-. Solely because of this marketing aspect, the producer lost some £34 worth of output or 26/- per hogg sold.

Costs and Charges

The divisor is per hogg fattened, i.e. 28. No tractor work was entailed. The length of the feeding period was 110 days.

	Total	Per Hogg
Purchased Feed (48 cwt. concentrates)	£63:18: -	£2: 5: 8
Home Grown Feed (2 cwt. hay)	-:18: -	-: -: 8
TOTAL FEED COSTS	64:16: -	2: 6: 4
Sundry Livestock Expenses (a)	2: 4: -	-: 1: 7
Labour (55 hours @ 5/6d)	15: 2: -	-:10: 9
Shed Charges (share)	1: 5: -	-: -:11
TOTAL COSTS and CHARGES	£83: 7: -	£2:19: 7
Number of Feeding Days	110	
Average Live Weight Gain (lb.)	32	
Average Live Weight Gain per Week (lb.)	2.04	
Cost of Concentrate/lb. L.W.G.	1/5d	
Conversion Ratio	6:1	

(a) Lime, Mineral Licks and Minel.

To the nearest shilling the total cost per hogg finished was 60/- or 49/- excluding labour.

The gross output totalled £81 or 58/- per hogg. Thus, the loss was 2/- per hogg. If labour costs were excluded, there would be a profit of 9/- per hogg. Had they been graded, there would have been an outright profit of around 24/- per head or 33/- excluding labour.

Considering the initial quality of the hoggs, the check to growth early in the feeding period and, above all, the fact that they were sold perforce in the store market, these shott Blackface lambs did remarkably well.

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