



Hill Sheep Event
September 6th 2017
Farm of Patrick Dunne
Glenmalure, Rathdrum,
Co. Wicklow

**This is a DAFM approved Knowledge Transfer
Sheep Event**



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Department of Agriculture, Food and the Marine
An tAire Talmhaíochta, Bia agus Mara



Introduction

We welcome you to today's event on the farm of Patrick Dunne. Patrick operates a sheep and cattle farm with a both hill and lowland sheep flocks. Today's walk will focus on his hill sheep enterprise and some of the changes Patrick is in the process of implementing as part of the Teagasc BETTER farm sheep programme. Patrick joined the programme in in 2015 and since then a detailed farm plan has been drawn up for the farm with the aim of improving the efficiency and output from the flock. Today's walk will focus on four main areas:

- Farm layout and farm
- Flock breeding policy
- Lamb performance and options for finishing hill lambs
- Management of upland vegetation

Each of these stands will provide you with an opportunity to engage with the speakers on a variety of topics, which we encourage you to do. This is a national qualifying event for the Knowledge Transfer Programme and we would encourage participants to ensure they register with the Department of Agriculture, Food and the Marine at the event.

Finally, we would like thank the Dunne family for their continued participation in the Teagasc Sheep BETTER farm programme and opening their farm today.



Farm Details

Farm size

- Hill grazing (commonage - 1/4 share)
- Lowland - 57 ha (~40ha rented)
- Sheep (Lowland and Hill flocks) & beef enterprises (Sucklers)
- Lowland flock started in 2016 with 250 ewes

Hill ewe flock

- 320 Cheviot & 20 Scottish Blackface ewes joined in November 2016
- Ewe flock out wintered on the hill
- Following scanning
 - Singles returned to hill until Mid-March
 - Twins kept on low ground
 - Ewes supplemented from Mid-March until lambing
- Lambing indoors from 1st April onwards
- Strong single rearing ewes and lambs returned to hill at ~ 7 weeks old

Farm Plan

Aim: For hill flock to pay for itself so as to retain BPS and other premia as profit

1. Breeding

- Bottom 25% of ewes (based on BCS) mated with Suffolk rams
- Target to lamb 350 hill ewes
- Lambing from April 10th onwards, outdoors on low ground
- Change flock breed structure

2. Flock Management

- Extend grazing time and numbers grazing on the hill
- Return more ewe's and their lambs to the hill from 5 - 7 weeks after lambing
- Targeted management of lambs from weaning time

3. Hill Vegetation

- Identify management practices to improve vegetation quality on hill

Early stages in farm plan

So far....

- Started buying Scottish Blackface ewes to run alongside Cheviots
- Breeding poorer BCS ewes to Suffolk rams
- Changed from housing Cheviots at scanning to holding ewes outdoors until point of lambing
- Started addressing soil fertility issues on low ground
 - Spread lime, N,P & K in response to soil tests

Flock Breeding

Dunne's Hill Breeding Policy Focused on:

- Building a lower cost flock that can better utilise the hill
- Improving ewe flock performance
- Producing a ewe that can graze for longer on the hill and perform adequately
- Reduce level of inputs for the hill ewe flock
- Improving ewe BCS and health
 - Suspected Toxoplasmosis in the flock last year
 - Lot of thin ewes going to the ram
- Using Suffolk rams on poorer BCS ewes (bottom 25%) to increase output from these ewes

Problems facing the implementation of this breeding plan?

- Ewes rearing poor quality lambs when grazing the hill for long periods of time
- Current input level high but output is low
- Not able to graze the hill properly to maintain vegetation quality

Proposed solution?

Split flock into three groups:

1. Cheviot ewes (1/3)
2. Scottish Blackface ewes (1/3)
3. Cheviot X Scottish Blackface ewes (1/3)

The aim being to improve the Cheviots ewe flock to perform better off the hill (long term plan) while also bringing ewes that can graze the hill and improve flock performance in the short term

Lamb Performance

Lamb Performance in 2017 is summarised in Table 1.

Table 1. Lamb performance in 2017

Birth type	Birth weight (kg)	7 Week Weight (kg)	Weaning Weight (kg)
Single (Lowland)	4.6	14.3	23.4
Twin (Lowland)	4.2	13.6	22.7
Single (Hill)	4.6	16.7	21.4

- Slightly better performance of single (Hill Lambs) at 7 weeks due to all lambs in this group being reared as singles, where as some cross fostering took place in lowland group.
- Single ewe lambs on hill since 7 weeks had an average daily gain of 160 g/day from turnout to weaning
- Since weaning meal introduced to male lambs
- Male lambs averaging 180 g/ day average daily gain since weaning (very satisfactory)

Finishing Store Hill Lambs on Autumn Pastures and on an All Concentrate Diets

Take Home Message

- If good quality autumn grass is scarce or not available, it is advisable to sell the store lambs in August and prioritise available grass and feed supplies to improve the body condition of ewes and ewe replacements.
- If purchasing, quarantine procedures should be followed once lambs arrive on the farm
- Lambs should be vaccinated against clostridial diseases and pasturella, possibly orf (if purchased) and dosed for internal parasites including liver fluke.
- Maximise weight gain from autumn grass. Best liveweight gains are achieved in August to end of October but grass quality must be good and well managed at all times.
- If planning to put lambs on an all concentrate diet prepare a budget in advance.
- If finishing lambs on an all concentrate diet, ensure diet is formulated for this purpose, initially offer 300 g/lamb/day and increase by 200 g/lamb/days every 3 days until full feeding, and continue to offer a small quality of long roughage (hay, silage, or straw). Ensure that lambs have water at all times
- When on a full concentrated feeding, regularly weigh lambs and market as they become fit.
- Differences between different strains of Scottish blackface lambs are small and almost all hill lambs are capable of meeting French market specification.

Introduction

The majority of the hill breeds are bred pure with an emphasis on producing flock replacements for retention or for sale. A proportion of the ewes, particularly in the better hill areas are crossed with either maternal breeds to produce quality replacements or crossed with terminal breed producing lambs for slaughter. Typically the cross bred lamb would be 3-4 kg heavier at weaning than the purebred hill lamb. Profits from these hill sheep enterprises is very much dependant on prices obtained for lambs sold. A large proportion of these lambs become available for sale annually from August onwards. Many hill lambs are sold to lowland finishers and reappear in the spring as hoggets. In recent years, prices for hill lambs and in particular light hill lambs in the autumn have been disappointing. Here we examine the options to improve the marketability and profitability of store hill land cross bred lambs.

Traditionally, Ireland has been relying on the Mediterranean markets including Portugal, Spain and Italy to take the lambs from the hill flocks. In the past, these markets required carcasses from 10kg and upwards, with preferences for carcasses from 12 to 15kg. While hill lambs meet these weight requirements, demands from these markets have declined in recent years. In the past number of years purchasers of store hill lambs in the autumn achieved good margins on these lambs because of good lamb and hogget prices in late winter early spring.

Performance of hill lambs on lowland pastures

In the autumn of 2014 Teagasc purchased Scottish Blackface wether and ram lambs from 5 farms in Mayo, Galway and Sligo area. On arrival lambs were dosed for fluke and worms, and received an 8:1 clostridia and orf vaccinations. Lambs were placed on pasture and their performance measured until December 2015. Interestingly, the performance of the light lambs (<25kg) surpassed the performance of the heavier lambs. This might indicate that there was some compensatory growth in the lighter lambs. From Mid-October to mid-November the performance of all lambs declined to an average of 45g/day. After mid-November daily liveweight gain declined to 0g /day. During the autumn grazing period the performance of ram and wether lambs was similar (Table 2).

Options for dealing with hill lambs

Because of the variability among hills and in the amount of green land available, there is no single option that best fits all hill farms.

Table 2. Performance of Scottish Blackface male lambs on lowland Pastures Athenry 2014

	Lamb Weight Category (kg)		
	<25	25.1-30	>30
Wt on 1 st August (kg)	24.3	27.3	30.5
ADG to 10 th October (g/day)	145	110	104
10 week gain (kg)	10.2	7.7	7.3
Wt 10 th October (kg)	34.9	35.30	38.10

Option 1: Sell at weaning

If good quality autumn grass is scarce or not available, it is advisable to sell the store lambs in August and prioritise available grass and feed supplies to improve the body condition of ewes and ewe replacements.

Advantages:

- Extra grass made available for ewe lambs and breeding ewes.
- Savings on flock health costs
- Improved cash flow

Disadvantages

- Poor prices for light lambs
- Limited markets.
- Lamb potential not exploited by primary producer

Option 2: Graze and sell mid-November

This requires excellent quality grass and grassland management. Usually lambs fail to perform for the first 2 weeks after going onto new pasture or are purchased in.

Advantages

- Heavier lambs
- Greater sale options
- Possibly higher prices

Disadvantages

- Less grass for ewe lambs and breeding ewes.
- Additional flock health costs
- Delayed cash flow

Expected Lamb performance

August – end Sept: 115g/day or 0.8kg/week

1st Oct – Mid Nov: 60g/day or 0.4 kg/week

Total live weight gain: After 12 weeks = 7.2 kg

This option would apply to purchasers of store hill lambs. Where lambs are being bought for autumn grazing it is important that they are purchased early in the autumn to maximise the gain from grazed grass.

Option 3: Graze + Supplementary meal feeding at pasture and sell mid-November

This also requires excellent quality grass and grassland management + meal feeding (300g/lamb/day) by trough

Advantages

- Heavier lambs
- Greater sale options
- Possibly higher prices

Disadvantages

- Less grass for ewe lambs and breeding ewes.
- Additional flock health costs
- Cost of concentrates (€6.30/lamb)
- Delayed cash flow and cash to purchase meal

Expected Lamb performance

August – End Sept: 155g/day or 1.1 kg/week

1st Oct – mid Nov: 100g/day or 0.7 kg/week

6-9kg concentrates required for 1 kg live weight gain.

Total gain after 12 weeks = 11kg.

The direct cost of the meal consumed per lamb will vary from €6.30 per lamb (€250/ tonne) to €8.82 (€350/ tonne). The key question is will the extra liveweight gained (expected to be about 4 kg) by the lamb more than covered by price obtained for the lamb in November.

Option 4: Finish lambs on all-meal diet after weaning

This essentially requires housing the lambs and finishing them on an-all meal diet.

Advantages

- Extra grass for ewe lambs and breeding ewes.
- Heavier lambs
- French lamb prices

Disadvantages

- Cost of meal
- Large quantity of meal required particularly for light lambs
- A long finishing period for light lambs
- Additional flock health costs
- Facilities
- Delayed cash flow and cash to purchase meal.
- Lambs finished before price rise in spring.

Option 5: Graze for a period followed by finishing on all-meal diet

With this option the lambs are grazed until end of October or even longer when kept at a low stocking rate. During this period lambs would be expected to gain on average about 7-10 kg if grazed on very good quality grass. At the end of grazing period lambs would be housed and finished on an all meal diet. This is in fact the system that is followed by many lowland farmers. Store hill lambs are purchased in the autumn and grazed on grass until December.

Advantages

- Heavier lambs at start of meal feeding period
- Reduced meal requirement
- French lamb prices
- Higher prices in January-March.
- Reduced finishing period

Disadvantages

- Less grass for ewe lambs and Breeding Flock.
- Additional flock health costs
- Facilities
- Cash flow?

Performance of Scottish Blackface and Texel X Scottish Blackface lambs on an all concentrate diet (Study1)

In recent years, Teagasc at Athenry have conducted a number of studies on the finishing of wether and ram Scottish Blackface and Texel cross Scottish Blackface store lambs on an all concentrate diet. The ration fed was 70% cereal ration with 15% protein and a UFL =1. The diet was formulated for this purpose and contained 0.5% ammonium chloride to mitigate the risk of urinary calculi. The ration was initially offered at 300 g/lamb/day and increased by 200 g/lamb/days every 3 days until full feeding was achieved. This usually took 12-14 days. A small quality of silage (400g/day wet weight) was offered to lambs. The performance of light and medium Scottish Blackface and Texel cross lambs are summarised in Table 3.

The Texel cross lambs had higher performance than the Scottish Blackface lambs, had higher intake and were more efficient converters of ration to liveweight gain and had better carcass conformation. Almost all lambs reached French market specification. In a subsequent study (Study 2) lambs were purchased at the end of July and grazed for period during the autumn and then housed and finished on an all concentrate diet. These lambs were heavier when placed on the all-concrete diet. Diet and feeding arrangements were similar to Study 1. Lamb mortality in this study was 1 lamb from 200 or 0.5%. Results are summarised in Table 4.

Rams lambs of both breed types had a higher daily gain and were more efficient converters of ration to liveweight gain than castrated wether lambs. As expected rams lambs had lower killing out rates, particularly Scottish Blackface ram lambs. Scottish Blackface lambs had significantly poorer conformation than Texel cross lambs with ram lambs.

Table 3. Performance of light and medium weight Scottish Blackface and Texel cross Scottish Blackface when finished on an all concentrate diet.

	Scottish Blackface		Texel x Scottish Blackface	
	Light	Medium	Light	Medium
Starting weight (kg)	24.8	29.1	24.9	29.9
Days on full diet	73	61	65	60
Total meal intake (kg)	89.4	72.6	82.2	77.6
Daily intake (kg)	1.24	1.19	1.26	1.3
ADG (g/day)	206	197	277	230
FCE	6.4	6.8	4.6	5.7

Liveweight gain (kg)	14.2	11.3	17.0	13.2
Slaughter weight (kg)	39.0	40.4	41.9	43.1
Carcass weight (kg)	17.1	17.6	17.4	19.3
Carcass Conformation				
% 'U'	0%		20%	
% 'R'	80%		80%	
% 'O'	20%		0%	
KO%	43.81	43.63	41.60	44.60
% Carcass > 15 kg (French		96		100

Table 4. Performance of heavy Scottish Blackface and Texel X Scottish Blackface lambs on an all concentrate diet.

	Scottish Blackface		Texel X	
	Ram	Castrate	Ram	Castrate
Start weight(kg)	36.9	36.0	40.8	41.2
Final live weight(kg)	46.3	43.8	54.1	52.9
Days on full diet	36	36	36	36
ADG (g/day)	255	218	364	315
Total Gain(kg)	9.2	7.8	13.1	11.3
Daily feed intake(kg)	1.42	1.41	1.66	1.63
FCE	6.29	7.08	4.73	5.51
Carcass weight (kg)	20.65	20.47	25.60	25.82
Kill out (%)	45.0	47.1	47.0	48.1
Carcass fat score (1-5)	3.22	4.21	3.04	3.77
Carcass grade (1-5)	2.57	2.57	3.72	3.68

At carcass weights of 20.5 kg, the carcasses from Scottish Blackface lambs were becoming over fat. This would suggest that when finishing Scottish Blackface wether lambs on an all concentrate diet the target carcass weight should be not more 18.5-19 kg. Rams lambs can be brought to a heavier carcass weight without becoming over fat.

Comparative performance of Cheviot, Mayo-Connemara, Lanark and Perth type males lambs

Teagasc have recently undertaken to examine the performance of Cheviot, Mayo-Connemara, Lanark and Perth type male lambs when finished on an all-concentrate diet. All lambs were castrated. Preliminary results are presented in Table 5. The performance of the Cheviot lambs,

measures as average daily gain (ADG), was significantly higher than the 3 Scottish Blackface breed types which were all similar. The Mayo-Connemara Scottish Blackface had a similar kill out percentage (KO %) to the Cheviot lambs. However, both Cheviot and Mayo-Connemara Scottish Blackface lamb types had significantly higher KO% that the Lanark and the Perth types. Mayo-Connemara Scottish Blackface bred type tended to be fatter and have poor conformation that the other 3 breed types which were all similar. Data on feed conversion efficiency are not yet available. All lambs were deem suitable for the French market and achieved premium price.

Table 5. Comparative performance of Cheviot, Mayo-Connemara, Lanark and Perth type males lambs on an all-concentrate diet.

	Breed type			
	Cheviot	Mayo-Connemara Scottish Blackface	Lanark Scottish Blackface	Perth Scottish Blackface
Weight at Start (kg)	29.5	29.9	29.0	28.9
Days on diet	62	62	62	62
ADG (g/day)	226	191	200	202
Final weight (kg)	42.6	40.9	41.4	41.5
Carcass weight (kg)	19.2	18.3	17.8	17.7
Kill out (%)	45.0	44.7	43.0	42.5
Conformation score	2.5	2.2	2.5	2.6
Fat Score	3.0	3.3	2.9	2.8

Shearing of lambs

Results from a study just completed in Athenry recorded no effect of shearing of the lambs at the start of the indoor feeding period had no effect on average daily gain, feed intake feed conversion efficiency or final carcass weight. Not surprisingly kill out percentage was 1.2 percentage points higher in shorn lambs. Based on these results there is no benefit to shearing lambs at start of indoor feed period. If contemplating shearing of hill lambs it is probably best to do it in August.

Variation in lamb performance

A significant feature of all of the recent studies at Athenry has been the observed significant variation in the liveweight performance of lambs on an all concentrate diet. Much of this variation in performance is directly related to the intake of concentrate feed by the lamb. Lambs with high intakes of 1.8-2.0 kg per day will perform at close to 450-500 g per day while lambs eating less than

1 kg per day will perform at about 100 g per day. Therefore, in any group of lambs there is going to be a mixture of low and high performing lambs. To avoid lambs becoming overweight and over fat it is vitally important to weigh lambs on a regular basis particularly as they approach slaughter weight.

Management of Upland Vegetation

Grazing uplands at a sustainable level is the ideal management for farming and biodiversity. Intervention to rejuvenate overgrown vegetation should only be considered if it is the plan to follow this with a sustainable grazing programme. A combination of control options may be required. Consultation with the National Parks and Wildlife Service (NPWS) is necessary if carrying out work (Activities Requiring Consent) in Natura areas. A study to identify Best Management of Upland Habitats in County Wicklow was carried out by Tubridy et al (2013). Some of the plant species that may require control in upland areas, discussed in the study are outlined below.

Purple moor grass (*Molinia caerulea*)

Purple moor grass is often called white grass in Wicklow; fedget grass in parts of Kerry; meelic from its habitat marsh place or milic in Irish; and by its Irish name Fionán. It can dominate large areas of blanket bogs. The name purple moor grass comes from the purplish tinge of the plants early in the season. According to the Grasses of Ireland (2012), *Molinia* grasslands can be recognised by the shiny look of a mountain on a windy day and were considered valuable, compared to the reddish coloured vegetation that indicated a dominance of cotton-grass, which had a lower rental value. Purple moor grass grows in tussocks and at the end of the growing season, an abscission layer at the base of the leaves similar to deciduous trees, results in the leaves breaking (Feehan et al., 2012) Where grazing levels are low, the leaves shed in autumn build up producing a dense litter layer. This has the potential to smother out other species; hence it is important to prevent such a dense layer from building up. Cattle are more likely than sheep to eat purple moor grass. In addition to grazing levels, timing of grazing is critical for the sustainable management of this species. Purple moor grass has a high grazing value, but only in spring and early summer, where after digestibility drops off quickly. Dead material remaining over the winter has negligible nutritional value and is relatively indigestible. Good examples of Purple moor grass dominated habitat will contain other plant species, a habitat for the rare and protected marsh fritillary butterfly (*Eurodryas aurinia*) or potentially nesting sites for wading birds. Poor examples of this habitat will be dominated by purple moor grass to the exclusion of most other species. Abundance of this species tends to be associated

with a reduction in cattle grazing or too frequent burning. As purple moor grass is a fire tolerant species, burning exacerbates the problem.

Bracken (*Pteridium aquilinum*)

Bracken dominated areas are poor for farming and biodiversity in general and tend to harbour ticks. Bracken is toxic to animals MAFF (1984), and spores contain carcinogens. The presence of bracken also increases the rate of soil or peat erosion. A reduction in cattle grazing and particularly hot frequent fires can enhance the growth of bracken. Asulam (Asulox) is a selective herbicide for the control of bracken. Applied in mid-July to mid-August, it is very effective in killing bracken (average of 98% reduction). A follow up treatment in the second year may be required. Asulam kills all species of ferns and some other plants which may be of importance. Asulam did not gain EU approval in 2011 and consequently DAFM (as well as the UK authorities) have issued an emergency approval each year since, for the control of bracken in upland areas, for a limited time period (120 days each year). This 120 day period usually commences around June. It is hoped that by 2018 a full (new) authorisation will be in place, when Asulam gets EU approval. Until then the only option is the emergency approval route.

Glyphosphate is a non-selective herbicide and therefore kills all plants it contacts. It may be used with a weed wiper to target bracken early in summer before plants get too tall to operate in. A second application may be needed in order to control all the bracken plants, including those that were too small at the time of the first application. Cutting/crushing can be useful in getting rid of bracken. It needs to be carried out twice per year, in late June and in Early August, each year for 3 years. On upland sites, because of nesting birds, cutting is not allowed until after the 31st August, so this method alone will not be an option.

Burning in general, speeds up the spread of bracken as the rhizomes are better able to withstand fires than more shallow rooted plants such as heather. But burning does break the dormancy of the rhizome and removes the build-up of decaying bracken plants. This method should only be used as a pre-treatment to other methods such as herbicide application.

Heather (*Caluna vulgaris*)

Where heather is present, the ideal situation for farming and biodiversity is a mosaic of heather and grassland with a good distribution of heather of all ages. If the age distribution is too skewed towards old heather and all grassland areas are lost to a full stand of heather, this is not good for farming or biodiversity. Prescribed burning, in patches, of tall strong heather is recommended, in accordance with the DAFM Prescribed Burning Code. Burning is only recommended when followed with sustainable levels of livestock grazing. Mechanical cutting of heather can be used to

make fire breaks and fire control lines for prescribed burning at a later date. For effective fire breaks, vegetation must be cut immediately prior to burning or the cut material removed before burning commences. Vegetation takes about eighteen months to rot down to be suitable as a fire break, if not removed. Cutting out lines of heather can facilitate the planning of patchwork burning.

Gorse / Furze / Whins (*Ulex europaeus*)

Mechanical control of gorse involves the physical removal of the bushes with an excavator, including the roots. This removes existing plants, but others grow back from seed. Bushes are usually heaped in mounds and burned or left to rot. This causes a lot of disturbance to the soil and may not be desirable or allowed on upland or SAC areas. Follow-up treatment is often necessary. Mulching with either a tractor- or excavator-mounted machine chops the plants down to ground level, leaving stumps behind. There are no plants to dispose of, as they are mulched up, but regrowth from the stumps usually occurs, and plants also grow back from seed. Cutting and stump treatment involves cutting the bushes as low as possible and painting the stumps with a suitable herbicide (Glyphosphate or Grazon 90) immediately to kill the roots. Cut plants have to be removed and heaped in mounds for rotting away or burning. Cutting is usually done using a chainsaw and is quite labour intensive, but may be an option on smaller areas of mature growth. There is no regrowth from treated stumps and with no ground disturbance, seed germination is minimised.

Herbicides can be used to kill mature gorse plants and there are a number of products available. Glyphosphate is non-selective and will kill all plants underneath, while selective products only kill gorse and allow other vegetation underneath to establish. There is still a lot of woody material left behind that takes a long time to rot away. Apply during active growth, generally early summer and ensure the entire plant is saturated. Use a suitable surfactant (wetting agent) to increase herbicide uptake. Herbicides can be used to control new regrowth following any control method. Regrowth is easier to kill and should be treated approximately 12 months after initial control. A selective herbicide for gorse should be used to avoid non-target competing plants. Feehan (2013) discusses the burning of gorse, which kills the above-ground stems and leaves entirely if sufficient heat is generated, though gorse seeds germinate with great ease in the bare ground under bushes that have been burnt. Burning is not recommended if the bushes are young as it will stimulate the growth of a forest of young shoots at ground level or from the bases of the stems. As gorse gets older the stems can be as much as 0.3 metre across, and it becomes less able to produce adventitious buds from the base if it is cut or burnt. Burning is a more effective way of clearing mature bushes over fifteen years old. Gorse regenerates prolifically from the seed bank after a fire, and ideally should be kept under control by grazing. The young fresh regrowth which follows burning is very sensitive to

herbicides. Repeated burning without follow-up treatment can lead to a dense carpet-like infestation. The best time to burn is between September and November, avoiding the bird-nesting season and also avoiding January-February which results in increased seed germination.

