Animal &
Grassland Research
and Innovation
Programme

# Teagasc Hill Sheep Conference

## Westlodge Hotel, Bantry, Co. Cork
## Wednesday, 22nd January

teagasc
Agriculture and Food Development Authority

Drinagh

MSD
Animal Health

# Teagasc Hill Sheep Conference

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|---|---|
| 18.00 – 18.10 | Conference Opening Prof Gerry Boyle, Director of Teagasc. |

**Session I**

| | |
|---|---|
| Chairman | Mr. Billy Kelleher, Regional Manager Teagasc West Cork |
| 18.10 – 18.40 | Improving the Productivity of Hill Sheep Flocks |
| | *Mr. Ciaran Lynch, Teagasc* |
| 18.40 – 19.10 | Finishing Hill Lambs |
| | *Mr. Frank Hynes, Teagasc* |
| 19.10 – 19.40 | Sheep Health: Focus on the Hill Flock |
| | *Prof. Michael Doherty, UCD* |
| 19.40 – 20.10 | Break – Light refreshments served |

**Session II**

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|---|---|
| Chairman | Mr. Darren Carty, Irish Farmers Journal |
| 20.10 – 20.40 | Markets for Hill Lamb |
| | *Mr. James Smyth, ICM, Navan* |
| 20.40 – 21.10 | Commonages & Cross Compliance |
| | *Mr. Liam Fahey, DAFM* |
| 21:10 – 21.25 | Prescribed fire as a Land Management Tool in Irish Uplands – |
| | *John Casey Teagasc & Ciarán Nugent, DAFM* |
| 21.25 – 21.40 | Close Conference |
| | *Mr Michael Gottstein, Teagasc* |

## Foreword

The Irish Hill Sheep sector plays an important role in the economic health of rural economies and the maintenance of the natural landscape in many of Ireland's most scenic areas. However, low margins coupled with reduced support payments and diminishing markets for hill lambs has seen the sector decline over the last two decades. This Teagasc Hill Sheep Conference aims to deliver the most up to date information in terms of Genetics, Nutrition, Health, Marketing and Policy. Notwithstanding the physical and land quality issues that operate in the hill areas, it is clear from the results emerging from the BETTER Farm Hill sheep programme that significant improvements in productivity and profitability are possible from relatively small changes in the main drivers of productivity.

Teagasc is strongly committed to its sheep research and advisory programmes. The expanded BETTER Sheep Farm Programme, the recent appointment of a Chief Sheep Specialist and the appointment of a third Specialist will accelerate the transfer of technologies from research to the industry. New Research programmes on finishing hill lambs, meat quality, genetic improvement, in conjunction with Sheep Ireland, grassland science are all very important for the future of the Irish Sheep industry. The increased collaboration between Teagasc, UCD, Department of Agriculture Food and The Marine and Sheep Ireland as well as overseas collaborators will further benefit the sheep industry.

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I would like to express my gratitude to all of the speakers who contributed both oral and written presentations and to you the attendance. The sponsorship of MSD Animal Health and Drinagh Co-Op is greatly appreciated. This booklet collates and summarises a significant body of knowledge on technical issues in sheep production and should prove an invaluable reference to hill sheep producers. I would like to thank all the Teagasc Staff who assisted in with the organisation of the National Hill Sheep Conference and especially thank the organising committee without whose efforts we would not be here today – they are; Michael Diskin, Frank Hynes, Phil Creighton and Michael Gottstein along with Billy Kelleher and his staff in Cork.

# Table of Contents

# Improving the Productivity of Scottish Blackface Hill Flocks

Ciaran Lynch & Michael G. Diskin

Teagasc, Animal & Grassland Research and Innovation Centre, Mellows Campus, Athenry, Co. Galway

## Introduction

The Hill Sheep farming sector plays a vital role in the Irish agriculture and also in the maintenance of delicate landscape. Hill sheep farming is carried out on a diverse range of land quality and farming systems. The 2012 national sheep census estimated the numbers of Scottish Blackface (S.Blackface) sheep on Irish farms (Table 1). A total of 821,130 sheep were designated as S.Blackface accounting for 22.9% of the total sheep recorded in the national sheep census. Scottish Blackface types represent the predominant breed of ewe in hill regions along the western seaboard, extending south from Donegal to Kerry and Cork as well as parts of Tipperary Waterford and Louth (amoung others).

**Table 1.** Number of declared S.Blackface sheep on the 2012 national sheep census

| Type | Number |
|---|---|
| Blackface Ewes | 554,010 |
| Blackface Hoggets | 118,889 |
| Blackface Rams | 14,227 |
| Blackface Other | 134,004 |
| Total Blackface | 821,130 |

Productivity in many if these flocks is typically low. National Farm Survey (NFS) reports would indicate that these flocks on average wean 0.8 lambs per ewe put to the ram. However, with the appropriate management and breeding changes increased productivity and profitability is possible, , Since the first season in the Teagasc BETTER Farm Sheep Programme in 2008/09, the 3 BETTER Farm Hill flocks have increased and successfully maintained a higher level of output (Table 2). This is an example of in the potential in commercial hill flocks. Increasing productivity in hill flocks even in difficult economic years is directly responsible for increased profit at farm level (Lynch et al., 2013).

**Table 2.** Flock productivity on the BETTER farm Hill Flocks

| Variable | 2008/09 | 2009/10 | 2010/11 | 2011/12 | 2012/13 |
|---|---|---|---|---|---|
| Litter size | 1.18 | 1.29 | 1.32 | 1.35 | 1.32 |
| Ewes lambed per ewe joined (%) | 88.2 | 79.5 | 95.9 | 93.5 | 95.4 |
| Lambs reared per ewe joined | 0.96 | 0.92 | 1.1 | 1.1 | 1.1 |

The paper will focus on a number of practical management and breeding changes which increase flock productivity.

**Factors influencing output per ewe**

The importance of improving ewe live weight and condition score at joining on subsequent productivity is not a new concept, nevertheless it is one area that is often adequately addressed at farm level. In both hill and lowland systems output per ewe is the key driver of productivity and ultimately profitability. Ewe output is predominantly determined by a combination of litter size and pregnancy rate, with litter size setting the upper limit. As changing breed change is not a viable or realistic option to increase prolificacy in hill flocks, these flock must rely on improving ewe live weight and condition score to increase litter. The relationship between live weight at joining and subsequent litter size is particularly strong in S.Blackface ewes. Using records from almost 2500 ewe matings records the relationship between ewe live weight at joining and subsequent litter size is presented in Figure 1. As ewe live weight at joining increases so does subsequent litter size. However, it is important to note that ewe weight is limited by the available feed resource on the respective farms, so the potential improvements that can be made will vary between farms.

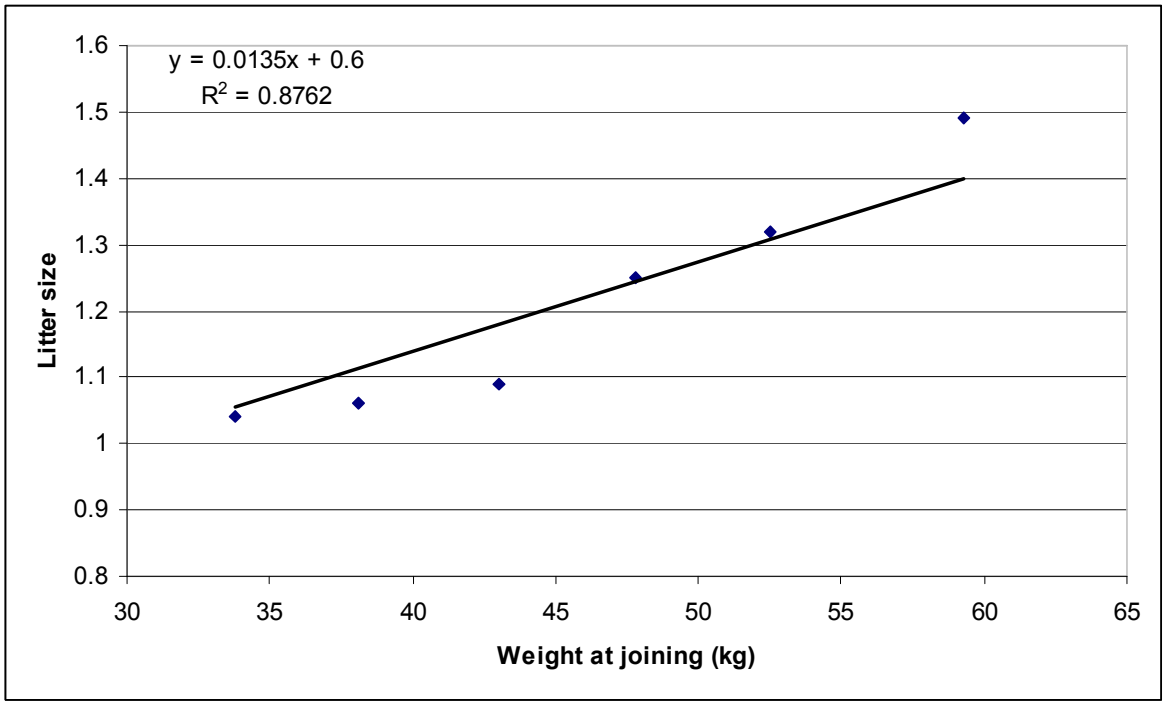


**Figure 1.** Relationship between ewe weight at joining and subsequent litter size in S.Blackface ewes

Given the positive effect of increasing ewe liveweight at joining on subsequent litter size it is, therefore, important to implement a management system to improve this aspect of performance. This was a focus of Teagasc Hill Research farm in Leenane. The data, as summarised in Table 3, provides a genuine example of how improved management can increase ewe live weight at joining over a 7 year period on the farm resulting in increased litter size and ultimately the number of lambs reared per ewe. Following litter size, pregnancy rate is the next key factor and is particularly important in hill flocks. As with litter size, flock management can have a major impact on pregnancy rate. There is a significant relationship between body

condition score at joining and subsequent pregnancy rate. For hill flocks the target condition score at joining is 3 or greater.

**Table 3.** Summary of ewe performance at Leenane over a 7 year period

| | | | Lambs per ewe to the ram | |
|---|---|---|---|---|
| **Year** | **Liveweight (kg) at joining** | **Ewes lambed %** | **Born** | **Reared** |
| 1991 | 38.9 | 91 | 0.94 | 0.86 |
| 1992 | 40.4 | 91 | 0.98 | 0.94 |
| 1993 | 40.1 | 91 | 0.99 | 0.97 |
| 1994 | 43.3 | 93 | 1.15 | 1.04 |
| 1995 | 43 | 88 | 1.09 | 1.03 |
| 1996 | 45.2 | 94 | 1.17 | 1.06 |
| 1997 | 44.5 | 91 | 1.19 | 1.12 |

*Adapted from Hanrahan & O'Malley 1999*

Again, using the data collected on the BETTER Farms the effect of body condition score at joining on pregnancy rate is illustrated in Figure 2. There was a 13.5% difference in pregnancy rate between ewes in a condition score of 2 and those that had reached the target condition score of 3. Therefore, this has a major impact on flock productivity.

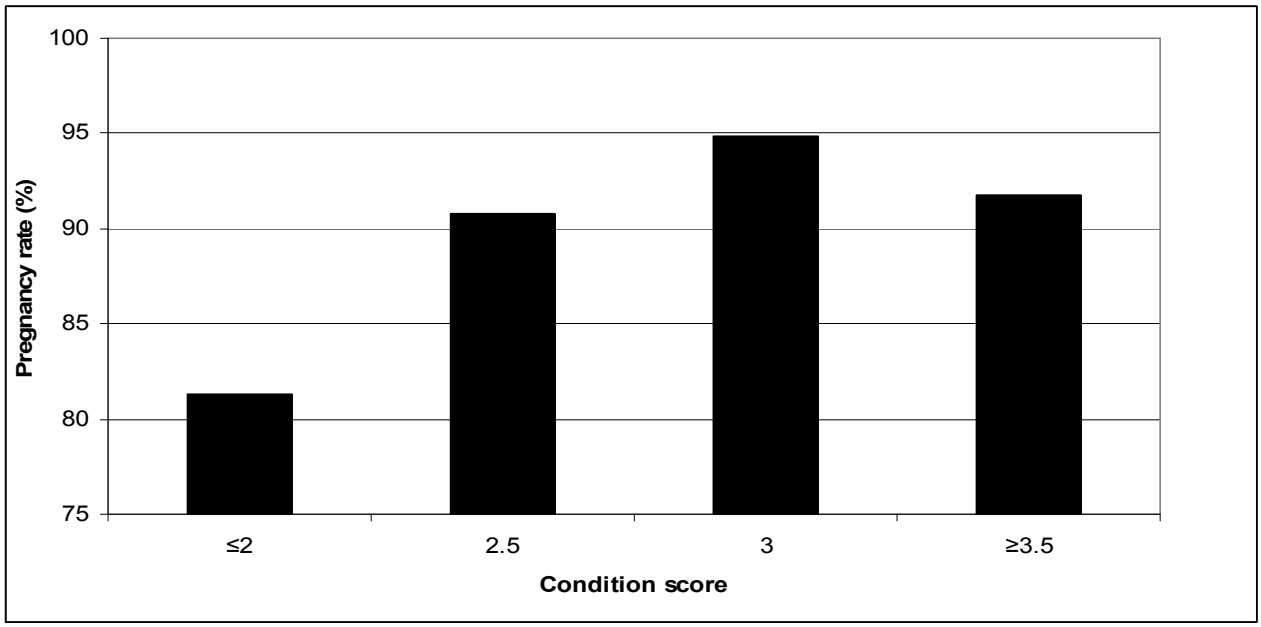


**Figure 2.** Pregnancy rate of ewes differing in condition score at joining on the BETTER farm hill flocks

Another aspect that both live weight and body condition score at joining have a significant effect on mating date and subsequent lambing date. Lighter ewes in poorer body condition will lamb later in the season; this is illustrated in Table 4. This suggests that these ewes in poor condition tend to cycle later and hence conceive later and/or repeat more often. By increasing ewes from a condition score of 2 to the target of body condition score for hill flocks of 3, would result in these ewes lambing 5 days earlier relative to ewes that remained in a body condition score of 2. Data captured on the BETTER Farms over the past number of

seasons would suggest that the majority of issues with the light and thin ewes will generally fall into the 2 vulnerable age categories: 2-tooth hoggets and old ewes. In many cases the latter ewe might have narrowly escaped culling earlier in the season. The 2-tooth hoggets are, in many case, not sufficiently well grown.

**Table 4.** Effect of increasing condition score from a base condition score of 2 on lambing days

| Condition score | Day's lambed earlier |
|---|---|
| + 0.5 | -2.5 |
| + 1 | -4.8 |
| + 1.5 | -5.9 |
| + 2 | -6.3 |

Often the performance of replacements is unchecked until too late in the season. From an analysis of over 20,500 live weight records collected in the Teagasc hill flock in Leenane on S.Blackface sheep, from the age of 6 to 55 months was used to generate growth patterns and from these targets for S.Blackface sheep at specific ages were generated (Lynch & Hanrahan, 2010). These targets are outlined in Table 5.

**Table 5.** Targets for weight at in the autumn at ram joining as a percentage of the mature ewe weight

| Age | Target |
|---|---|
| Ewe Lambs | 61 |
| 18-month | 84 |
| 30-month | 91 |
| Mature | 100 |

*Adapted from Lynch & Hanrahan, 2010*

To account for the difference among hill farms, using absolute live weight targets may not be appropriate. Targets for various age categories are more appropriately expressed as percentage of mature weight – thus accounting for potential inherent differences between flocks and or hill areas. The mature ewe live weight for a flock will be largely influenced by the hill grazing area on which they are managed; there are slight differences due to strain differences that will be discussed in later sections. However, for more difficult hills (similar to Leenane) a target mature ewe weight of 45 kg is reasonable, for hills with greater semi-improved areas the target should be higher, closer to 50 kg or greater depending on the individual farm.

Another issue that was highlighted on the BETTER Farms was the occurrence of ram fertility issues and the management of rams during the mating period. This can have a substantial effect of pregnancy rate and flock output. Potential problems can occur where an individual or a number of rams are either sub-fertile for periods of the breeding season or totally infertile. This risk of infertility or subfertility becomes a much significant issue where batches of ewes are joined with individual rams. In such a single sire mating systems, in theory with good stockmanship an infertile ram should be detected after one cycle because a large number of ewes would be observed repeating. However, this may not always be the case. Equally, a sub-fertile ram may present a bigger issue as they may go undetected for the entire breeding period. Based on recorded data

an example of the effect of using a sub-fertile ram is highlighted in Table 6. In this example, an individual ram (Ram 3) clearly underperformed, however he did successfully mate ewes during each week of the joining period - hence managed to go undetected until the end of the single sire mating period. The risk of ewes being mated by a sub-fertile/infertile ram can be minimised by exposing them to more than one ram during the mating period and rotating rams. If using single-sire mating (i.e. an individual ram with a batch of ewes) is part of the plan it should only be done for a limited period (e.g. 17 days or so), after which group mating should be used.

**Table 6.** Percentage of ewes pregnant by mating (ram) group percentage of these that lambed per week

| Ram used | Ewes lambed within 4 weeks (%) | Week of lambing | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| Ram 1 | 83.9 | 19.2 | 46.8 | 23.4 | 10.6 |
| Ram 2 | 87.3 | 29.2 | 31.3 | 35.4 | 4.2 |
| **Ram 3** | **64.3** | **11.1** | **22.2** | **22.2** | **44.4** |
| Ram 4 | 88.5 | 39.2 | 17.4 | 17.4 | 26.1 |
| Ram 5 | 88.5 | 17.4 | 26.1 | 47.8 | 8.7 |

Similar problems can occur where group mating is used and there is a dominant ram that has a fertility issue so rotating rams is advisable.

**Use of semi improved/enclosed grazing areas**

In hill farming areas the proportion of semi improved grazing areas is highly variable and in many cases region specific. A survey of hill farming areas in Connemara/Mayo region is presented in Table 7.. This examined the percentage of mowable or arable areas in each region further emphasising differences that exist among hill farm regions.

**Table 7.** Percentage of land including commonage classified as arable/mowable[†]

| Location | % mowable |
|---|---|
| Twelve Bens | 5 |
| Maam | 3 |
| Tourmakeady | 41 |
| Louisburg | 25 |
| Newport | 15 |
| Bangor Erris | 6 |
| Leenane research farm | 7 |

[†] 50% of the farms have commonage Adapted from Nolan 1999

For farms operating with limited semi improved grazing areas the management options for the flock are more restricted. However, there are options to improve the quality of grazing available as discussed in the latter section of these proceedings by Casey & Nugent. Nevertheless, a significant proportion of hill farms

have access to a reasonable amount of greenland to provide options for the type of farming system they can implement. One of the key messages from the BETTER Farm hill flocks focused on the importance of developing a management system on each farm to make the best use of the available resources. As each of the flocks has access to enclosed greenland areas, a plan was put in place for each farm to enable this resource to be used to its full potential. These greenland areas can be used strategically at key stages throughout the year as a feed reserve or to graze particular categories of sheep. During the early autumn period greenland areas can be used to improve ewe live weight and body condition at joining, which as outlined in the previous section, has a major impact on reproductive performance and ultimately ewe output. Where access to greenland is limited, ewes should be drafted onto the lowland areas on the basis of condition with priority given to more venerable categories e.g. light hoggets and older thin ewes. In order to achieve the desired weight gains this will need to occur up to 8 weeks prior to joining depending on the increase in live weight / body condition required.

Designated areas for lambing and subsequent management of twins were a vital tool in improving flock performance. There are a number of factors influencing lamb performance within and across flocks, including, health, genetics and a number of management related aspects. The level of lamb performance can vary greatly between different hill flocks. To illustrate this point we examined 4 years of lamb's performance data from the 3 hill flocks participating in the BETTER Farm Programme. The average birth weight and weight at 14 weeks for lambs on each farm is presented in the Table 8. Although the average weights of lambs produced changed during the years the individual ranking on the farms remained the same i.e. ranking was consistent from year to year. While there were slight differences in birth weight there was a substantial difference (+4 kg) among the farms by the time lambs reach at 14 weeks of age. (see Table 8).

**Table 8.** Lamb Performance on the BETTER Farm Hill Flocks during a 4 year period

| | **Farm 1** | **Farm 2** | **Farm 3** |
|---|---|---|---|
| Birth weight (kg) | 4.1 | 4.4 | 4.4 |
| 14 week weight (kg) | 23.8 | 28.0 | 25.6 |

It is likely that inherent differences in flock management account for some of the variation in lamb performance; however, a large proportion of variation in lamb performance can be attributed to the differences in the grazing environment. In a hill context the amount of enclosed or semi improved land is a key factor influencing lamb performance. In a study by O'Toole (1978) the effect of grazing semi-improved pasture on the performance of hill lambs during the rearing phase was examined. In the study lambs were grazed either for the entirety of the rearing phase (lambing to weaning) on the hill or spent either 21, 56 or the entire period up to weaning of 110 days grazing the semi-improved areas. The results (Table 9) of the study clearly indicate that there was a linear effect of increasing duration grazing the semi improved areas on lamb performance.

**Table 9.** Effect of improved pasture on lamb performance during the rearing period

| Days on improved pasture | 0 | 21 | 56 | 110 |
|---|---|---|---|---|
| Lamb weight (kg) | 20.7 | 25 | 29 | 32.6 |

Adapted O'Toole 1978

The importance of developing a management system to strategically use of the feed resource available on any specific farm, particularly at lambing and surrounding weaning is a key step in improving lamb performance.

**Crossbreeding**

There are a substantial number of flocks that can successfully market S.Blackface lambs and command premium prices for breeding stock. However, in general and beyond producing sufficient flock replacements, too high a level of pure breeding may be hampering productivity and indeed profitability. Crossbreeding may be an option worth considering.The percentage of the flock that can be used for crossbreeding will depend primarily on the level of flock productivity. If we assume that a typical hill flock requires a replacement rate of 24 % relative to number of breeding ewes and even when we allow for 10% of any of the potential ewe lamb replacements to be discarded, it still leaves a substantial parentage of the flock available for crossbred lamb production. Taking these factors outlined into account the influence of number lambs reared per ewe joined on the proportion of ewes required to produce purebred replacements is outlined in Table 10.

**Table 10.** Potential breeding strategies for hill flocks

| Lambs reared per ewe joined | Pure breeding (%) | Crossbreeding (%) |
|---|---|---|
| 0.80 | 66 | 34 |
| 0.85 | 62 | 38 |
| 0.95 | 56 | 44 |
| 1.00 | 53 | 47 |
| 1.05 | 50 | 50 |
| 1.10 | 48 | 52 |

*Adapted Lynch 2012*

Therefore, a flock has the option of selecting the required number of ewes for producing replacements and putting the rest to a crossing sire or like a number of flocks simply taking ewes out of pure bred production after a given number of lamb crops (e.g. 4 lamb crops). In realistic terms it is probably advisable to keep the older ewes in the flock for this purpose.

The potential benefits in terms of lamb performance need to be examined. Using records from 2549 lambs produced from S.Blackface ewes on the BETTER farm hill flocks. These lambs were sired either by S.Blackface rams or by either Belclare or Bluefaced Leicester rams (maternal crossing) or Texel and Suffolk rams. As the breeds were not represented equally on each of the farms they were instead grouped and their progeny was referred to as crossbreds for the purposes of analysis. The results are presented in Table 11. Crossbred lambs were slightly heavier at birth (+0.4 kg), grew faster (+ 25g/day) and by weaning were 3 kg

heavier than their purebred S. Blackface counterparts. Data from a study on 6 commercial flocks in Northern Ireland by Carson et al.,(2011) also found that Texel and Blue-Faced Leicester progeny grew faster up to weaning (+22 g/day) compared to the pure S.Blackface counterparts, this further highlights the increase in animal performance that can be achieved. This difference in performance remains during the finishing period. Preliminary date from an ongoing study on finishing hill lambs being conducted in Teagasc Athenry (Personal comm. Claffey *et al*. 2014) would suggest that crossbred progeny grew 36 g/day faster during the finishing period and had a higher kill out (~1.7%) than their purebred S Blackface counterparts. Therefore, whether finishing the lambs produced on the farm or selling as store lambs there is an advantage in increasing the proportion of crossbred lambs available. Crossbred breeding sales are successfully operated in number of areas where a market has been developed.

**Table 11.** Performance of different lamb types on the BETTER farms

| | **S.Blackface** | **Crossbred** |
|---|---|---|
| Birth weight (kg) | 4.0 | 4.6 |
| Weaning weight (kg) | 24.3 | 27.3 |
| Growth rate (g/day) | 207 | 232 |

However, this it may take a number of seasons to reach its full potential and requires good organisation, sufficient numbers of animal of a similar and consistent type and ultimately commitment from those involved.

**Strain Differences**

Within the S.Blackface breed there are a number of different strains, each with slightly different characteristics and perceived beneficial attributes. During the mid 70's,a study involving almost 1000 S.Blackface ewes was conducted in the Western research centre hill farm in Maam. A total of 6 representative rams from each of the 4 strains of S. Blackface and 6 Wicklow Cheviot rams were used to generate progeny to evaluate the merits of each strain. The results (Table 12) would indicate that the Mayo type, local to the region was the most productive followed by the Lanark type. Higher incidence of lamb mortality for the Wicklow cheviot and Perth type contributed to their lower output. When the data in Table 12. is examined more closely it's important to note the low liveweight at joining and poor overall reproductive performance that occurred as a result. This further highlights the importance adopting a management system to increasing ewe live weight at joining as mentioned previously.

**Table 12.** Comparative performance of 4 strains of S.Blackface and one strain Cheviot ewes

| | | No. of lambs per ewe to the ram | |
|---|---|---|---|
| **Sire Type** | **Liveweight (kg)** | **Born** | **Reared** |
| Mayo Blackface | 35.9 | 0.91 | 0.79 |
| Waterford Blackface | 38.6 | 0.86 | 0.7 |
| Lanark Blackface | 37.2 | 0.87 | 0.77 |
| Perth Blackface | 36.5 | 0.86 | 0.66 |
| Wicklow Cheviot | 39 | 0.81 | 0.64 |

*Adapted Hanrahan 1999*

The performance of the wether lambs produced from the different ram strains was also examined. These lambs remained on the hill and were weaned in early August. Following weaning they were housed and put onto an ad-lib pelleted roughage / concentrate diet. Lambs were selected for slaughter at approximately 30 to 31 kg liveweight. The Lanark type produced the heaviest lambs at weaning with minimal differences detected during the finishing period indoors (Table 13) .

**Table 13.** Lamb performance from the 4 strains of S.Blackface rams and one strain of Cheviot

| | S.Blackface Strain | | | |
|---|---|---|---|---|
| | Mayo | Lanark | Waterford | Perth |
| Weaning weight (kg) | 17.9 | 18.8 | 15.9 | 17.3 |
| Slaughter weight (kg) | 31.1 | 31.6 | 29.8 | 30.5 |
| Finishing period ADG (kg) | 0.16 | 0.17 | 0.16 | 0.16 |
| Carcass weight (kg) | 14.5 | 14.1 | 13.4 | 14.2 |

*Adapted Sheehan 1975*

In a subsequent study conducted at the Teagasc Hill Research farm in Leenane, local Mayo type rams were compared to those from the Newton Stewart strain. The effect of sire strain on the performance of their female progeny was compared over 3 seasons. The results are summarised in Table 14.

**Table 14.** Effect of S.Blackface Strain on performance of ewes

| | S. Blackface Strain | |
|---|---|---|
| | Local | Newton Stewart |
| No of ewes joined | 951 | 99 |
| Weight at Joining | 45.4 | 47.2 |
| Ewes Lambed % | 89 | 93 |
| Litter size | 1.31 | 1.33 |
| Lambs reared per ewe Joined | 1.07 | 1.18 |

Adapted Hanrahan & O'Malley 1997

The main differences observed was a significant increase in ewe weight at joining in favour of the Newton Stewart type but with no difference in the number of lambs born. However, the Newton Stewart type ewes had a numerically higher pregnancy rate which contributed to an extra 0.11 lambs reared per ewe joined. This difference was however influenced by a higher incidence of losses that occurred in the local ewe type during those years which was attributed to SPA or jaagsiekte. There was also a strain effect on lamb performance. Lambs sired by Newton Stewart rams were heavier at birth, grew faster and by weaning were 1.5 kg heavier than those sired by local type rams. These results are summarised in Table 15.

**Table 15.** Performance of lambs sired by different S.Blackface Strains

| | **S. Blackface Strain** | |
|---|---|---|
| | **Local** | **Newton Stewart** |
| Birth weight (kg) | 3.5 | 3.7 |
| Weaning weight (kg) | 22.7 | 24.2 |

*Adapted Hanrahan & O'Malley 1997*

The advantage of any individual strain would appear to be for the most part limited with a few exceptions. Based on the recorded studies the main differences between these strains may be confined to visual differences for particular markets or crosses and individual farmer preference. However, the studies would suggest survivability may be a more important issue than lamb performance particularly on harsher hill environments. There may be merit in repeating a number of these studies to confirm any strain x environment interaction or whether the differences in progeny performance have changed significantly over the years.

**Genetic improvement**

In all aspects of livestock breeding there is scope to improve performance/productivity, animal health etc. by implementing a genetic improvement programme. One of the main limiting factors for the S.Blackface breed is the absence of a flock book with parentage information. In 2010 a total of 343 breeders were registered with S.Blackface societies (Gottstein, 2010). Since this list was compiled additional societies/sales were organised. With the development of Sheep Ireland there is now the potential for the national flock to implement a multi-trait genetic improvement programme. With considerable effort from those involved, this has been a developed and expanded over a number of seasons. Currently there are a number of S.Blackface flocks providing data at various levels (see Table 16.) In addition to these flocks there is parentage and production data from the 3 BETTER farm hill flocks included in the sheep database recording.

**Table 16.** S.Blackface flocks recording through Sheep Ireland

| Location | Number of flocks | Data Provided |
|---|---|---|
| Mayo/Connemara | 10 | Parentage & production data |
| Waterford | 4 | Parentage & production data |
| Donegal | 3 | Parentage & production data |
| Mayo/Connemara | 40 | Parentage only |

*Personal comm. Wall & McDermott*

Preliminary data from an ongoing study on the 2 of the hill BETTER farms in. Sligo and Mayo has shown that there is scope to improve performance through sire selection. On each farm 4 rams were used in single sire mating groups to provide parentage on their progeny. Their performance was monitored during 2013. The weaning weights for each sire is presented in Table 17. For the Sligo and Mayo farms there was up to 1.9 and 2.4 kg respectively of a difference at weaning from the progeny of the rams used on each farm. In addition 2 of the rams used on each farm had Euro Star Ratings. The difference between these was positively in favour of the higher indexed ram in both cases. While there is a limited number of sires used the study, the study also suggested that we are currently not capturing the true variation that exists within the S.Blackface breed – hence the need for more animal recording by breeders and greater linkage across flocks. Nevertheless preliminary results are encouraging. The next step is to get a substantial proportion of breeder to commit to helping implement a genetic improvement programme for the S.Blackface breed. In the long term this would be a highly beneficial exercise for the hill sheep sector, however, it cannot occur without the commitment of breeders.

**Table 17.** Performance of progeny from 8 different sires used on the hill BETTER farms

| Farm | Ram used | Eurostar production rating | 14 week weight (kg) |
|---|---|---|---|
| Sligo | 1 | 4 | 22.7 |
| Sligo | 2 | 3 | 22.6 |
| Sligo | 3 | - | 20.8 |
| Sligo | 4 | - | 21.6 |
| Mayo | 5 | 2 | 20.1 |
| Mayo | 6 | 5 | 21.3 |
| Mayo | 7 | - | 22.1 |
| Mayo | 8 | - | 22.5 |

**Conclusion**

There is significant scope for hill flocks to improve productivity at farm level. A key focus should be on improving ewe productivity with careful attention being given to improving ewe weight and condition at joining. Where available, strategic use of semi-improved areas can improve both ewe and lamb performance. For the majority of flocks there is some potential to increase output by exploiting crossbreeding Small

difference been found between individual strains of S.Blackface and there may be some justification to re-examine some of these. Choice of strain in most cases is down to individual farmer preference. A realistic prospect of sustainable genetic improvement of the S.Blackface is now emerging but will require the support of farmers to realise its full potential. For hill flocks as with all farming systems adopting a positive outlook and implementing a plan for the farming system is always important.

**Acknowledgements:** The assistance of A. Kinsella, G. Howard and E.Wall was greatly appreciated.

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# Options for Finishing Hill Lambs

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## Introduction

There are currently almost 2.5 million ewes in Ireland (DAFM, 2012). The Scottish Blackface breed accounts for approximately 22% of these. The majority of these Blackface sheep are maintained on hills or marginal land that is not suited to other sheep breeds or other farm enterprises. 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 September onwards. In recent years, prices for hill lambs and in particular light hill lambs have been disappointing. Indeed, it is often difficult to find a buyer even at a very low price for some of the lighter lambs coming off the hills. This paper will briefly examine the overall market situation for hill lambs in Ireland and will examine at different options to improve the marketability and profitability. The main focus of this paper is on pure Scottish Blackface lambs with some minor references to crosses of the breed.

## Market

There has been a steady increase in sheep numbers in recent years with overall sheep numbers at the end of 2012 up by 16.4% from the end of 2009. This has been encouraged largely by an improvement in prices. Demand from our main markets of France and the U.K. have continued to be relatively strong with some smaller but growing markets from other European countries. However, to satisfy these markets, lamb carcases greater than 15kg are generally required. As far as hill sheep are concerned, in a grass based system it is only lambs from the more productive hill farms with a reasonable amount of lowland that are capable of producing lambs for these markets. 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 carcases from 10kg and upwards, with large numbers of carcases required from 12 to 15kg. While hill lambs meet these weight requirements, demands from these markets have declined in recent years. The data presented in Table 1 outlines the quantity of sheep-meat exports from Ireland to Portugal, Spain and Italy from 2009 to 2012.

**Table 1:** Sheep-meat exports (tonnes) from Ireland to Portugal, Spain & Italy from 2009 to 2012

| | Year | | | |
|---|---|---|---|---|
| **Country** | **2009** | **2010** | **2011** | **2012** |
| Portugal | 1,435 | 636 | 368 | 137 |
| Spain | 190 | 261 | 59 | 74 |
| Italy | 1,574 | 986 | 1,085 | 1,256 |
| Total | 3,209 | 1,883 | 1,512 | 1,467 |

*Source: Bord Bia*

There has been a 54% decline in the level of exports to the three Mediterranean countries, and an 87% decline in the combined Portuguese and Spanish markets. This has been largely driven by the poor performance of the economies of these countries. Indications for 2013 are that the amount of lamb supplied to Portugal and Spain has declined further with a minor increase in demand from Italy. On the positive side, a new market has emerged with significant quantities of light lamb being exported to Tunisia in 2012 and this doubling to 355 tonnes of sheep meat by the end of October 2013.

**Hill Lamb Performance**

There is much evidence that the performance of pure Scottish Blackface lambs in terms of liveweight gain, feed intake and feed conversion efficiency is lower than that of lowland lambs or from hill lambs crossed with lowland breeds (Carson et al. 2001; Diskin and Claffey, 2014). However, general performance trends are similar with both lowland and hill lambs.

**Performance at grass**

Post weaning performance at grass very much depends on quantity and quality of grass available. Well grown weaned hill lambs on well managed pasture can achieve approximately 115 g/ day (Nolan et al. 2003). This was consistent with earlier work by AFT (1984) who reported that well grown weaned hill lambs on well managed pasture can achieve approximately 0.8 kg / week or 114 g/d in early autumn, (August / early September) while in late autumn, (Sept /October) this performance will drop to 0.4 kg / week. Lynch & Hanrahan, (2009) found similar performance on hill farms involved in the Teagasc BETTER farm programme. Growth rate at this time of the year on the hills will be below this level. Furthermore, if the weaned lambs are very light, less than 25 kg, at this time of year performance will be depressed further.

**Forage plus concentrates**

Annett and Carson (2011) fattened lambs on 3 forage based diets. Lambs were offered 0.5 kg concentrates plus ad-lib access to grazed grass, maize silage or precision-chop grass silage. The lambs finished on the grass based diet, under good grazing conditions grew faster than those finished on the diet including grass silage (116g/day live weight gain vs. 85g/day). Furthermore, due to the high intake characteristics, maize silage was superior to grass silage for finishing lambs indoors. Growth rate on the maize silage plus concentrates was 105g/day live weight gain vs. 85g/day on the grass silage plus concentrates. They argue

that growth rate of lambs fattened on 0.5kg concentrates plus ad-lib forage is approximately 50% of the levels reported for similar lambs finished on concentrate diets.

**Silage for fattening lambs**

If considering fattening lambs on a combination of silage and concentrates a word of caution is required. The data presented in Table 2 outlines the effects of silage quality and concentrate level on lamb performance. This work was conducted on lambs of lowland breeds. The data presented demonstrates that medium quality silage of 70% DMD makes very little contribution to lamb carcass gain. It is clear from the figures that daily carcass gain increases with increasing level of concentrate. Furthermore, if concentrates are purchased at a cost of €250 per tonne (possible in late 2013 and early spring 2014 by buying straight ingredients and home mixing) margin over feed also increases with the proportion of concentrate in the diet.

**Table 2.** Effects of silage type and concentrate level on lamb performance

| **Treatment** | | **Carcass gain (g/d)** | **Margin over feed (c/d)** |
|---|---|---|---|
| Silage | **Concentrate (kg/d)** | | **Carcass price €4.50 Concentrate price €250/T** |
| 75 DMD | 0.2 | 74 | 19 |
| | 0.5 | 85 | 18 |
| | 0.8 | 114 | 26 |
| 70 DMD | 0.2 | 14 | -3 |
| | 0.5 | 62 | 12 |
| | 0.8 | 86 | 16 |
| Concentrate | Ad-lib | 157 | 33 |

Source: Keady, (2012)

Keady's (2012) concluded that medium feed value silage of 70% DMD has no role in finishing store lambs. Using silage to fatten lambs should only be considered if top quality silage which is greater than 75% DMD is available. However, of the silage samples analysed for Teagasc clients in 2013, the average DMD was 68.6% with an average protein content of 11.6% (Kavanagh (2013). DMD values ranged from 52% to 80%. These results include samples from all enterprises throughout the country. The silage analysis results for 2012 show that silage quality was significantly below this level (Kavanagh, 2012). Therefore, only a very small proportion of Irish farms produce silage that is above 75% DMD. Given that hill sheep farming is generally practiced on marginal land, it is unlikely that hill sheep farms will produce silage greater than the average, let alone of the high quality required for lamb fattening.

Carson, et al. (2001) fattened pure Scottish Blackface lambs and various cross breeds on either of two diets. One was a high forage diet with 80% of the diet in the form of silage and the remaining 20% being a concentrate. The second diet was a low forage diet with 20% in the form of silage and the remaining 80% being a concentrate. The silage fed was good quality of over 77% DMD. The trial started at weaning time

with the Scottish Blackface lambs weighing approximately 28 kg live weight and the cross bred lambs ranging from 31 to 33 kg live weight depending on breed. All lambs were slaughtered at approximately either 38 kg or 46 kg liveweight. The lambs finished on the low forage – high concentrate diet had a higher intake, greater liveweight and carcass gains, more efficient food conversion ratio and had a greater kill out proportion. Furthermore, they took on average 64 days less to take to slaughter weight. The Scottish Blackface lambs on the low forage high concentrate diet grew almost two and a half times as fast (197g/d vs. 80g/day liveweight gain and 102g/d vs. 41g/d carcass gain) as their counterparts on the high forage diet, Therefore, it is unwise to attempt to fatten hill lambs on a silage based diet without firstly having the silage analysed and then should only be considered if the silage is top quality.

***All Concentrate diets***

Diskin and Claffey, (2014) fattened Scottish Blackface lambs and crosses of the Scottish Blackface breed on an all concentrate diet. This diet consisted of 60% cereals at 15% protein. Lambs were also offered approximately 100g of silage / per head/ day as a roughage source. Performance data from these lambs are presented in Table 3. It is clear from the data that pure Scottish Blackface lambs and crosses of the breed can be fattened in a relatively short period on high concentrate diets.

**Table 3.** Performance of pure Scottish Blackface lambs and Blackface cross lambs fattened on an all concentrate diet (preliminary results)

| Breed | Start Liveweight (kg) | Liveweight gain (g/day) | Carcass gain (g/day) | Slaughter Liveweight (kg) | Carcass weight (kg) | Kg feed (Fresh wt) per kg Liveweight | Kg feed (Fresh wt) per kg carcass | KO % |
|---|---|---|---|---|---|---|---|---|
| Pure Scottish Blackface | 29.5 | 202 | 105 | 41.4 | 17.67 | 5.21 | 9.82 | 42.7 |
| Blackface cross | 31.4 | 248 | 136 | 44.1 | 19.53 | 6.63 | 11.95 | 44.4 |

Source: Claffey & Diskin (2014)

The pure Scottish Blackface lambs grew at a rate of 202g/day. Carson et al. (2001) achieved similar growth rates of 196g/day, on a diet comprising of 20% silage, on a dry matter basis. Farmers generally have major concerns about the performance of hill lambs of less than 25 kg. On the Diskin and Claffey trial, these lambs grew at the rate of 203g/day liveweight which was no different from the lambs with a greater initial liveweight. Furthermore, 98% of all Scotch Blackface lambs achieved a carcass weight of greater than 15 kg and 96% of carcasses were classified R on the EUROP grid with the remaining 4% classified as O grade. Preliminary results also indicate that all of the pure Scotch Blackface lambs slaughtered had a fat score of 2 or greater (Diskin and Claffey, 2014). This data suggests that even light hill lambs of less than 25kg

liveweight can be successfully fattened to acceptable carcass weights of greater than 15kg on an all concentrate diet.

Sheehan and Lawlor (1974) achieved performances ranging from 170 to 200g/day live weight gain. This was with young lambs ranging from 6 to 12 weeks old and with initial live weights ranging from 16 to 21 kg at the start of the trial, with finishing weights of the order of 31 to 32 kg. Lambs with an initial live weight of 20 kg and fed on a high quality ration based on maize grew at a rate of 170 g/day liveweight and had a feed conversion ratio of 6 kg dry matter per kg live weight gain (approximately 7 kg of concentrate fresh weight per kg live weight gain) (Sheehan and Lawlor, 1974). This may appear to be a relatively low food conversion ratio. However, carcass gain was very satisfactory with these lambs on the maize diet. They had a conversion ratio of 9 kg dry matter / kg carcass gain, approximately equivalent to 10.6 kg concentrate fresh weight / kg carcass gain. This is comparable to the performance achieved by Keady (2012) with lowland lambs fattened on ad-lib concentrates.

Sheehan and Lawlor (1974) also fattened lambs on various other concentrate diets. However, liveweight gain, carcass gain, and feed conversion ratios both on liveweight and carcass basis were poorer with all diets than on the maize based diet. This supports the opinion that when fattening lambs on concentrates, ration quality is critically important. With concentrates costing €320 / tonne, and 10.6 kg concentrate needed for 1 kg of carcass gain, it costs €3.39 in feed costs to put on 1 kg carcass. When a lamb achieves a target of over 15 kg carcass with adequate level of fat cover and thereby qualifies for the higher price bracket (French type carcass), it then becomes profitable.

**Kill Out %**

There is some degree of variation in expected kill out percentage from lambs fattened on different diets. Diskin and Claffey (2014) found pure Scottish Blackface lambs had a kill out percentage of 42.7% with this rising to 44.4 for the cross breeds (Table 3). Carson et al. (2001) achieved a kill out of 43.8% with pure Scottish Blackface lambs killed at fat class 3 with the cross bred lambs having a higher kill out proportion. Annett and Carson (2011) found kill out percentages of 44% for hill lambs finished on concentrates and maize, 44.8% for lambs finished on concentrates and grass and 45.2% for lambs finished on concentrates and grass silage. Sheehan and Lawlor (1974) had kill out percentages from 47 to 48 % with pure Scottish Blackface lambs weaned at 6, 9 and 12 weeks and, fattened on a range of concentrate diets and killed at approximately 32 kg liveweight.

**Which finishing system to chose**

The information outlined in Table 4 summarises the feed requirements and costs of three systems for finishing hill lambs in the autumn / winter period. These systems are, an all concentrate diet, concentrates plus grass, and finally concentrates plus high feed value grass silage.

**Farmer Options**

With limited options for light lambs, it is important to examine what farmers can do to make those lambs more marketable.

**Light Lamb Options**

While demand for light lambs has declined in recent years, there is still a limited market available for lambs ranging from 12-15 kg. This is either from the Mediterranean market, albeit at a reduced level or for diced meat in the U.K. market. Unfortunately, the price paid in this weight range throughout the year is considerably below that paid for carcasses of 16 kg and above. These lambs need to be reasonably well fleshed and need a minimum liveweight of approximately 30kg. Some options for lambs of various weights are examined below:

**Table 4.** A comparison of three systems for finishing hill lambs in the autumn / winter period (to gain 15 kg liveweight)

| | Finishing system | | |
|---|---|---|---|
| | All concentrate | Concentrates + Grass | Concentrates + grass silage |
| Expected Daily liveweight gain (g/d) | 200 | 115 | 85 |
| Days to gain 15 kg LW | 75 | 130 | 176 |
| Concentrates consumed | 78 | 65 | 88 |
| Forage required | 6.6 kg silage * | 104 kg grass ** | 88 kg silage * |
| Concentrate cost (€320/T) | 24.90 | 20.08 | 28.16 |
| Forage cost (est.) | 1.12 | 7.28 | 14.96 |
| **Total feed cost** | **€26.02** | **€27.36** | **€43.12** |
| Other factors to consider | Shed availability<br>Fixed costs<br>Health issues | Fixed costs<br>Health issues<br>Poor weather<br>Grass wastage<br>Alternative use for grass<br>How late in the season<br>Longer finishing time | Silage quality<br>Shed availability<br>Fixed costs<br>Health issues<br>Longer finishing time |

* Silage valued at €0.17 / kg DM

** Grass valued at €0.07 / kg DM

**A light hill lamb weighing 20 kg live weight**

One option is to sell this lamb as a store lamb.

Alternatively, another option is to use concentrates to take this lamb to a 32kg live weight aiming for a 13 - 14 kg carcase. A budget for this, whereby the costs involved and the likely returns at different prices is presented in Table 5. It is clear that in the current economic climate, with poor demand and subsequently poor price, using a high cost system to produce a light carcass is not an attractive option.

**A hill lamb weighing 25 kg live weigh**

As above, one option is to sell this lamb as a store lamb. Another option is to feed to reach 32 kg and slaughter for the light market. The budget would be similar to above with feed costs reduced by about half as only 7 kg live weight gain is required. A third option is to use concentrates to take this lamb to 42kg live weight aiming for a 17 - 18kg carcase. A budget for this, similar to the budget prepared above for the lighter lamb is presented in Table 6. As the store lamb is heavier than in the previous example, it is reasonable to bring this lamb to a heavier live and carcass weight. By doing so, the lamb will qualify for the higher priced market. Every effort should be made by farmers to have their store lambs at least 25 kg by weaning time in late summer. The store lamb is subsequently much more attractive to buy.

**Table 5.** Costs and returns for feeding a 20 kg hill lamb to reach 32 kg live weight on an all concentrate diet

| | € | € | € | € |
|---|---|---|---|---|
| **Selling price (€/kg carcass weight)** | | **3.60** | **3.80** | **4.00** |
| Lamb Value – 13.76kg carcass (32 kg LWT @ 43% KO) | | 49.53 | 52.28 | 55.04 |
| Costs: | | | | |
| Meal: | | | | |
| Initial 2 weeks : 6kg @ €320 / Tonne | 1.92 | | | |
| Finishing period : 84kg @ €320 / Tonne ** | 26.88 | | | |
| Vet., dosing, hoof care, vaccines | 2.00 | | | |
| Mortality | 1.50 | | | |
| Other variable costs | 1.00 | | | |
| Total Variable Costs (see note below) * | 33.30 | | | |
| Fixed costs | 3.00 | | | |
| Total Costs | 36.30 | 36.30 | 36.30 | 36.30 |
| Value of 20 kg hill lamb in Autumn + Margin | | 13.23 | 15.98 | 18.74 |

** Expected liveweight gain – 170g/day, for 70 days, consuming 1.2 kg concentrates daily

**A hill lamb weighing 35kg live weight**

As above, one option is to sell this lamb as a store lamb. Another option is to slaughter the lamb for the light market as above. If the lamb is reasonably well fleshed and has been reared on grass to-date it will probably kill out at about 14.5 kg carcases. At a price of €3.80/kg the carcass is worth €55.00. A third option is to use concentrates to take this lamb to 45kg live weight aiming for a 19 - 20kg carcase. A budget for this, similar to the budget prepared above for the lighter lamb is presented in Table 7.

**Table 6.** Costs and returns for feeding a 25kg hill lamb to reach 42kg live weight on an all concentrate diet

| | € | € | € | € |
|---|---|---|---|---|
| **Selling price (€/kg carcass weight)** | | **4.60** | **4.80** | **5.00** |
| Lamb Value – 17.9 kg carcass (42 kg LWT @ 42.7% KO) | | 82.34 | 85.92 | 89.50 |
| Costs: | | | | |
| Meal: | | | | |
| Initial 2 weeks : 6kg @ €320 / Tonne | 1.92 | | | |
| Finishing period : 90kg @ €320 / Tonne ** | 28.80 | | | |
| Vet., dosing, hoof care, vaccines | 2.50 | | | |
| Mortality | 2.00 | | | |
| Other variable costs | 2.00 | | | |
| Total Costs (see note below) * | 37.22 | | | |
| Fixed costs | 3.00 | | | |
| Total Costs | 40.22 | 40.22 | 40.22 | 40.22 |
| Value of 25 kg hill lamb in Autumn + Margin | | 42.12 | 45.70 | 49.28 |

** Expected liveweight gain – 200g/day, for 85 days, consuming 1.05kg concentrates daily

**Table 7.** Costs and returns for feeding a 35kg hill lamb to reach 45kg live weight on an all concentrate diet

| | € | € | € | € |
|---|---|---|---|---|
| **Selling price (€/kg carcass weight)** | | **4.60** | **4.80** | **5.00** |
| Lamb Value – 19.2 kg carcass (45 @ 42.7% KO) | | 88.32 | 92.16 | 96.00 |
| Costs: | | | | |
| Meal: | | | | |
| Initial 2 weeks : 6kg @ €320 / Tonne | 1.92 | | | |
| Finishing period : 52kg @ €320 / Tonne | 16.64 | | | |
| Vet., dosing, hoof care, vaccines | 2.00 | | | |
| Mortality | 1.50 | | | |
| Other variable costs | 2.00 | | | |
| Total Costs (see note below) * | 24.06 | | | |
| Fixed costs | 3.00 | | | |
| Total costs | 27.06 | 27.06 | 27.06 | 27.06 |
| Value of 35 kg hill lamb in Autumn + Margin | | 61.26 | 65.10 | 68.94 |

** Expected liveweight gain – 200g/day, for 50 days, consuming 1.05 kg concentrates daily

*In tables 5, 6 and 7 a*nimals housed on straw will have additional associated costs.*

**Conclusions**

A decline in demand for light hill lambs in recent years has led to poor prices being paid for these lambs. However, through careful management, value can be added to these lambs. Every effort should be made,

through planned grassland management to maximise weaning weight. There are then a number of options open to deal with these well grown weaned hill lambs. They can be sold directly for slaughter for the limited light carcass market, they can be sold as stores for further feeding by the purchaser, or they can be successfully fattened by the producer on a high concentrate diet to achieve the French type carcass of greater than 15kg.

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**Management of Commonages and Agri Environment Schemes**

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## Introduction

Agri-environment schemes such as REPS and AEOS compensate farmers for income forgone or costs incurred as a result of participating in an agri-environment scheme. REPS was introduced in 1994 and at its peak in 2007, there were 60,000 farmers in REPS. When REPS 4 closed in 2009; there were approximately 30,000 farmers in the scheme. A total of 1,000 of these farmers completed their 5 year contract at the end of 2012 with a further 12,000 completing their contracts in 2013. The vast majority of the remaining 17,000 farmers will have completed their REPS contract by the end of 2014. The average REPS payment in 2013 was €5,400 In terms of AEOS, there are approximately 20,000 farmers across AEOS 1, 2 and 3. The AEOS 1 scheme started in September 2010, with AEOS 2 commencing in September 2011. AEOS 3 commenced in May 2013. The average AEOS payment in 2013 was €3,200.

Commonage lands form an important part of the farming enterprises of many farmers, particularly along the west coast. They also form an important part of the local environment from the point of view of bio-diversity, wildlife, amenities and economic returns e.g. tourism. There is a substantial risk of land abandonment as under-grazing become more of a problem. Under-grazing leads to an increase in ineligible land under Direct Aid and Agri-Environment Schemes and leads to risk of financial corrections being imposed by the EU Commission. It is vital, therefore, to maintain the commonages in GAEC (Good Agricultural and Environmental Condition), or where there is under-grazing, to return the habitat to GAEC.

The farming of commonages lands has a long tradition in Ireland. It is by its very nature a complex area. In the vast majority of cases, however, commonage shareholders work well together on a co-operative basis. Each year approximately 4.7 million hectares of eligible land is declared by applicants under the Direct Aid and Agri-Environment Schemes. Of that area, in excess of 330,000 hectares of commonage lands are declared – representing 7% of the total area declared. In 2012, almost 15,000 applicants declared commonage lands – equivalent to 11% of scheme applicants.

Commonage lands in Ireland are mainly situated along the western coast, in particular, in Donegal, Mayo, Galway and Kerry. The areas of commonage lands in these counties, as is illustrated below; comprises of almost 71% of the total commonage land declared. (Mayo: 84,000 ha; Kerry: 54,000 ha; Donegal: 51,000 ha; Galway: 45,000 ha). Commonage lands include both upland and lowland grazing habitats. However, these lands have been used mainly for the maintenance of sheep flocks. Cattle are also grazed in some commonages as are other animals such as the Kerry Bog Ponies.

The experience to-date since the Single Farm Payment was introduced in 2005 is that there is a growing problem of commonage land being abandoned by farmers. This is not good for the environment, as these areas lose the specific characteristics as natural habitats for flora and fauna. In addition, the creeping ineligibility of these lands under the Single Payment Scheme and other Direct Payment Schemes poses a significant risk to the State in view of the risk of financial corrections being imposed by the European Commission. There was also a need to replace the now outdated and no longer valid Commonage Grazing De-stocking Plans, which were drawn up in the late 1990s to deal with the then over-grazing problem arising from the level of sheep maintained on the hills to maximise farmers' payments under the coupled Ewe Premium Scheme. While over-grazing is still an issue in some known areas, the main problem facing us is the under-grazing of commonages. A variety of reasons have led to a problem with under-grazing:

- Introduction of decoupled payments (SPS) in 2005.
- Age profile of farmers with commonage lands.
- Low market returns – resulting in reduced livestock numbers.
- More attractive returns from off-farm income during the Celtic Tiger era.

**Reason for Review**

There was an opinion that a number of commonages throughout the country were now reaching a situation where they were undergrazed.

- Sheep prices had improved and there is a renewed demand to increase hill sheep numbers.
- Off-farm employment has decreased significantly with a resultant increased interest by the younger farmers.
- Requirement under EU Regulations to manage the hills in such a manner as to be maintained in Good Agriculture Environment Conditions (GAEC).
- Danger of burning where undergrazed has become an issue in recent years.

The objective of the current review of commonages is to ensure:

- That the lands are maintained in Good Agricultural and Environmental Condition (GAEC).
- That the sustainable stocking of all commonage land is achieved.
- Those sheep farmers who may have been destocked in the original CFP can once again increase sheep numbers subject to NPWS stocking rates for each of the commonages.
- Within a number of years all commonages will continue to be maintained in GAEC, are being sustainably managed and farmed and are contributing both locally and nationally in terms of the environment, tourism and biodiversity.

During 2012, DAFM in conjunction with the National Parks and Wildlife Service (NPWS) engaged with all the main farm organisations on setting out a roadmap to ensure that the approx 400,000 hectares of commonage claimed annually by farmers on their SPS continued to remain eligible for Department Scheme Payments. This was in the context of the National Parks and Wildlife Service updating the stocking levels for all commonages which had a CFP. This involved setting an overall total minimum and total maximum stocking level in ewe equivalents (EE) for each commonage to ensure that the commonage was sustainably grazed and to ensure that it remained eligible for Department Scheme payments. The overall total minimum and maximum EE translates into an individual minimum and maximum based on the number of shares and claimants on the commonage. The main differences from previous CFP are:

- The minimum/maximum only applies to the commonage. There is no link with privately owned lands.
- The historic link with ewe premium quota numbers is broken.

**Future Schemes**

Future agri-environmental schemes offer the opportunity for claimants with commonage land to receive slightly higher payments than a non – commonage farmer where the land is collectively managed. While not all claimants on the commonage would have to be signed up to the collective management plan, it is proposed a baseline of in the region of 60 – 70% participation would be reasonable. While details on a new agri-environmental scheme within the next RDP has yet to be finalised, higher payments for commonage land managed with a collective management plan offers an opportunity for active claimants to increase their EE numbers on the commonage over and above their individual minimum and maximum levels once they are within the total minimum and maximum figures for the commonage and are managed in accordance with the collective plan drawn up by the claimants on the commonage.

**Issues**

While naturally, there will be reservations from both farmers and farm organisations on any approach towards collective management of commonages as it also means collective responsibility for all actions carried out on the commonage, the alternative is that commonages in some cases continue to be undergrazed. The risk of undergrazing over multiple years is that eventually these commonages will not be considered to be maintained in GAEC ruling them out of Department scheme payments. The Department will be allowing a lead in time to allow farmers to adjust their EE numbers to comply with each claimant's individual minimum and maximum EE figures within the context of the total minimum and maximum EE for the commonage.

**Conclusion:**

The whole purpose of collective management of commonages is to ensure that these commonages continue to remain eligible for Department scheme payments for the benefits of the claimants on the commonages. Taking all of these matters into account, it is the Department's aim is to ensure that a practical solution is reached, which will ensure that the current farmers actively farming these lands are protected; that the land is maintained or returned to GAEC and that the requirements of the governing EU Regulations are met. This can best be achieved by working with the farmers directly managing the lands, relevant State Agencies, the farming organisations and all other interested stakeholders. It will not be an easy task but it is achievable if we all work in a co-operative basis.

**Prescribed fire as a land management tool in the Irish uplands**

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## Introduction

Despite a notorious reputation for generally mild and moist weather, Ireland has experienced an increasing problem with wildfire incidence in recent years. Between 2000 and 2009, an average of 3500 /annum wildfire incidents were recorded annually by fire and rescue services, and this peaked at over 6800 incidents in 2010. A wildfire is any uncontrolled fire in combustible vegetation that occurs in the countryside or a wilderness area. Wildfire differs from a prescribed fire by its extensive size, the speed at which it can spread out from its original source, its potential to change direction unexpectedly, and its ability to jump gaps such as roads, rivers and firebreaks. The causes and contributory factors to wildfire development are complex, and involve geographic, climatic, demographic and socio-economic elements. Changes in agricultural practice and demographics in upland areas have resulted in less intensive grazing regimes, greater fuel accumulation and increased frequency and severity of wildfire incidence. There is a strong correlation between the timing and location of wildfire patterns and agricultural burning, traditionally associated with extensive grazing practices in upland areas and along the western coast of Ireland. The term prescribed or controlled burning is used to describe the planned and deliberate use of fire as a land management tool during the current legally permitted period from the 1st September to the 28th February, under the Wildlife Act 1976 & the Wildlife (Amendment) Act 2000.

## Context

Types of incidents range from small unattended outdoor fires to more serious extensive wildfires involving thousands of hectares of upland vegetation. Forest losses associated with these fires are usually between 350 and 500 hectares destroyed annually, but may be in excess of 750 hectares in bad fire years where suitable weather conditions permit. Both 2010 and 2011 were considered to be catastrophic years for fire by Irish standards, with over 1,500 hectares of forest lost in both years, and up to 25,000 ha of open land burned over in each of these years. Wildfires consume more than just forests and bogland. They damage our lands, our farm infrastructure and our grazing potential. They threaten the safety of our most delicate ecosystems and habitats, and the flora and fauna that

live in them. In 2013, 75% of the burnt area detected in Ireland by the European Commission was located within Natura designated land (European Commission, 2013). Fires destroy investments in forestry that are earmarked as future raw materials, pension and college funds, future timber exports, economic potential and jobs. They directly threaten the homes and safety of communities who live in fire prone areas, and rob our communities of vital emergency service response capabilities. Wildfire incidents in Ireland also kill, and as many as 10 people are known to have died in connection with wildfire incidents since 1996, the majority of whom were involved in agricultural burning activity.

**Fire as an agricultural tool**

Fire has been used for centuries to effect desired changes in vegetation conditions; enabling rapid removal of unwanted, dead or older, less productive vegetation from land, and creating favourable conditions for new growth for pasture or game cover. Fire is a powerful but dangerous tool, in the right hands and with the right application prescribed fire can enable rapid and cost effective treatment of unwanted vegetation; but fire needs to be used with skill and understanding if it is not to do more harm than good. Ultimately, the benefits of burning to the land must justify the effort and level of risk involved. Poorly planned or executed burning will cause long-term damage to soil and upland hydrology or hasten unwanted vegetation change that will in turn reduce productivity in livestock enterprises. Uncontrolled and inappropriate burning of land leads to the destruction of already fragile habitats and wildlife. Most importantly, burning under unsuitable conditions leads to dangerous wildfire incidents. Safety and consideration for neighbours and wider communities must therefore be paramount in planning and implementing safe, responsible controlled burning operations. This is especially so, given the generally negative image of fire as a management tool in the minds of the public, and some policy makers.

**Why burn vegetation?**

Most land burning practice now relates to extensive pasture management for sheep, and limited upland beef enterprises. Burning of upland pastures, often dominated by *Molinia caerulea* (purple moor grass, fionán grass) and *Calluna* and ericacious heathers is primarily undertaken to improve grazing conditions through the removal of accumulated coarse, dead and woody material from the target vegetation. On heather dominated sites, the aim of fire is to reverse the growth phase of heather to encourage the development of new succulent shoots, as well as reducing overall vegetation height. Typically, this is attempted through the application of infrequent large burns, often in dry conditions, with little regard to the condition of fuels or likely intensity of the resulting

conflagration. The nature, extent and frequency of land burning, and the habitats in which this activity occurs are contentious issues and impact on overall land productivity. Reconciling the differing objectives of farming, conservation, public recreation, forestry, requires a clear understanding of each of these objectives and respective perceptions. A number of pilot wildfire interagency groups have been established in order to discuss how the burning of mountain vegetation can be done in a safe way while working within the legislative framework that currently exists. Participants to date include the ICSA, the IFA, Teagasc, An Garda Síochána, Local Authorities, Fire and Rescue Services, the National Parks and Wildlife Service, the Forest Service, and Coillte. There is a very strong emphasis on cooperation between the landowners and state agencies as well as developing a shared understanding of the issues and opportunities to work together.

**Prescribed burning**

Prescribed burning can be defined as the controlled application of fire to a predetermined area, at a specified time of day and season, and under specified weather and fuel conditions, so as to ensure that the intensity, rate of spread and extent of spread of the fire meet planned land management and treatment objectives, and comply with legal, environmental and social constraints. In implementing prescribed burning operations, careful planning and preparation ensures that these specific treatment objectives can be achieved, without causing wildfire outbreaks that may put lives and property at risk. To this end, the Department of Agriculture, Food and the Marine has produced Codes of Practice for Prescribed Burning, to assist land managers in the safe use of fire. This guide should be consulted by anyone wishing to use fire as part of their land management activity. With safety considerations foremost, land managers must consider what the desired outcomes of burning will be, in terms of vegetation treatment and transition. In most cases, the objective will be to maintain or favour heather species, over less beneficial species such as *Molinia,* to provide the maximum level of nutrition, throughout the year. Such an approach will also have significant benefits in terms of maximising habitat values and minimising potential fuel values of these species.

**Managing heather species**

Heather species require careful management where burning is concerned, if burned too frequently they will die off, and if burned too infrequently they will deteriorate in terms of quality. *Calluna* often shows a slow initial regrowth response following burning. The aim of heather burning is to interrupt the natural life cycle of the plant in order to retain young heather shoots which are nutritionally superior to old heather for grazing animals and bird species such as Red Grouse (*Lagopus lagopus*) – a priority conservation species which

depends entirely on heather for all dietary and habitat requirements. If heather is not managed it takes on a very dishevelled appearance and eventually breaks down in patches and dies after about 25-30 years. By this stage, heather is of very little value for grazing animals and birds. The most productive heather moorland is one with a patchwork of heather at different stages of maturity. Prescribed heather burning as a management strategy should encourage new growth to sprout from existing heather plants, remove dead material and recycle nutrients.

Heather can usually be burnt once it has reached a height not less than 30cm (approx 12 inches). Care is required in stands of tall (rank) heather to maintain flame length within manageable limits. This is the key to successful application of fire. The presence of large amounts of coarse fuels in large woody plants brings the risk of difficulty in controlling the intensity and behaviour of such fires, and the risk of fire escape and degeneration to wildfire status. Over-hot fires will cause long term soil damage. Burning in damper weather conditions may alleviate these issues somewhat but it is preferable and safer to treat taller heather mechanically using a flail or swipe mower, where terrain permits. Some patches of heather (and other heathland vegetation) should be allowed to remain and grow to over 40 cm (about 16 inches) to increase structural diversity and provide havens for wildlife. The aim is for such areas to cover 10% or more of the overall land area. Mixed heather/grass communities should be managed with a preference for heather conservation over grasses as the objective, preventing the encroachment of less nutritious coarse grasses such as *molinia,* and maintaining site productivity.

***Molinia*** *Molinia, Juncus* and other grass species will burn easily and rapidly when dead in spring, and can dry out to flammable condition in a short time following rain where wind conditions permit. A coarse grass, *Molinia* has colonised many upland areas thanks to improper burning techniques and the consequent decline of heather populations. It can be very problematic for fire control due to its propensity to spread burning windborne fragments in windy conditions. While *Molinia* is highly digestible, and provides suitable summer grazing, its limited growing season (May-August) provides inferior grazing nutrition during winter months. This means that maintenance of optimally aged and structured *Molinia* and heather cover is vital to successful winter grazing opportunities, even at a lower nutritional quality (Grant and Maxwell, 1988). Thus any management regime should attempt to achieve a reduction of the dominance of *Molinia* in the vegetation mosaic and an increase in dwarf shrubs, especially *Calluna*.

***Gorse***

As a shrub species, gorse incursion onto extensive pasture lands may pose difficulties in many areas. Gorse species are problematic for prescribed burning due to their highly flammable and unpredictable nature as fuel, particularly European Gorse. Additionally, as a fire adapted species, burning stimulates gorse seed to

germinate, and will result in greater spread of gorse at the expense of more preferred species for grazing or game management. Prescribed burning of extensive areas of gorse should be avoided in the absence of suitable preparation and installation of effective control lines. Ideally, alternative mechanical methods should be used to grub or mulch stands for long term effective control, subject to agreement with NPWS/DAFM as applicable in designated or REPS areas. Where small isolated patches of Western (low) Gorse exist within a matrix of grasses and heather, it may be possible to treat these patches with fire more intensively, having first burned off the other fuels in the normal fashion.

**Bracken**

Like gorse, bracken (*Pteridium aquilinum*) poses a serious challenge to management by prescribed fire. Bracken spread will be further stimulated by burning, and controlled burning of dead bracken is notoriously problematic**,** due to its high flammability. As such, bracken should not be controlled using fire. With the recent delisting of Asulam as an approved herbicide, the use of chemical control for bracken is now also severely restricted. Where bracken is an issue for grazing management, alternative prescribed grazing or mechanical control measures should be employed.

**Other species**

Other species usually favoured following burning are *Eriophorum vaginatum*, *E. angustifolium* (bog cotton) and *Vaccinium myrtillus* (bog myrtle*) and Deschampsia* (wavy hair grass). Studies of vegetation canopy structure have shown that, even with the exclusion of the main grazing herbivores, *Calluna* will not re-establish itself as the dominant species until several years after burning (McFerran and McAdam, 1995). Such a mosaic has the potential to increase in farm enterprise productive capacity, through interactions between vegetation communities and livestock utilisation and can also result in benefits to ecosystem development and the control of potential fuel accumulation.

**Conclusions**

- There is increasing recognition of the role of fire as a potentially positive land management tool. Changes in agricultural practice and demographics in upland areas have resulted in less intensive grazing regimes, greater fuel accumulation and increased frequency and severity of wildfire incidence.
- There is a strong need to bring upland areas back into active/productive management, which balances agricultural objectives with conservation and habitat management objectives in a sustainable manner. In this context, traditional controlled burning techniques and traditions need to be updated to fit within the modern landscape.

- Modern hill farmers have a responsibility to conduct land burning activity in a manner which maximises the benefits to their farming enterprise while minimising risks to the land and the communities around them. Therefore, a thorough knowledge of fire and its influence on vegetation under different conditions is essential to carry out necessary prescribed burning operations effectively and safely.
- A high degree of cooperation between landowners, and between landowners and other concerned stakeholders is also required. Local level fire inter-agency groups, such as those operating in counties Cork and Kerry provide a suitable forum for discussion and platform for improved cooperation, training and knowledge transfer.
- Landowners are strongly advised to seek NPWS advice on habitat and conservation issues during the planning phase and to notify the Fire Service of the intention to burn on the day of burning. Landowners seeking to burn land are obliged by law to notify in writing the owners of forestry within one mile of the planned burn, and similarly notify the Gardaí of their intention to burn.

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