Animal &
Grassland Research
& Innovation
Programme

Teagasc

Hill Sheep Conference 2015

Sheep Technology Adoption Programme Approved (STAP)

Castlecourt Hotel, Westport, Co. Mayo
Wednesday, 28th January 2015

teagasc
Agriculture and Food Development Authority

Hill Sheep Conference

Teagasc Hill Sheep Conference Programme

18.00 – 18.10	Opening: Peter Leonard, *Regional Manager, Mayo.*
Session I:	Chairman: Peter Young, Irish Farmers Journal
18.10 – 18.40	Options for finishing hill lambs *Prof. Michael Diskin, Teagasc, Athenry, Co. Galway.*
18.40 – 19.10	Feeding of the hill ewe *Shane McHugh, Teagasc, Ballyhaise , Co. Cavan*
19.10 – 19.40	Hill Sheep Marketing – The Mayo Story *Tom Staunton, Sheep Farmer, Tourmakeady, Co. Mayo.*
19.40 – 20.10	**Break – Light refreshments served**
Session II	Chairman: John Noonan, Teagasc, Westport, Co. Mayo
20.10 – 20.40	Maintaining a high standard of health in hill flocks including vaccination and parasite control strategies. *John Fagan, Regional Veterinary Laboratory, Athlone.*
20.40 – 21.10	Profiting from performance recording in a hill flock, *Sam Wharry, Chairman, NSA in Northern Ireland, Carnlough, Co. Antrim.*
21.10 – 21.40	Reducing the losses caused by external parasites *Dr Peter G. Bates, Veterinary Consultant, UK*
21.40 – 21.50	Close Conference: Mr Frank Hynes, Teagasc

Organising Committee:
Philip Creighton, Michael Diskin, Frank Hynes, Michael Gottstein, Ciaran Lynch & Shane McHugh

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 depressed markets for store 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 Nutrition, Flock Health, Marketing and Flock Recording. 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 have, in recent months, increased the number of BETTER Hill farms with the recruitment of farms in South West Cork and Wicklow. The results emerging from on-going studies with finishing of hill lambs in Athenry provides a clear roadmap for increasing the value of the hill lamb. The success of the different producer groups in south Mayo clearly shows what dedicated farm with a clear vision can achieve.

Teagasc is strongly committed to its sheep research and advisory programmes. The expanded BETTER Sheep Farm Programme, the commencement of new studies on genomic selection, in conjunction with Sheep Ireland, mineral nutrition, meat quality is relevant to all sheep producers. Teagasc is also committed to recruit further research to its programme in Athenry. The increased collaboration between Teagasc, UCD, Department of Agriculture Food and The Marine and Sheep Ireland as well as overseas collaborators will be of further benefit the sheep industry.

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 Mullinahone 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 this 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, Shane McHugh, Ciaran Lynch and Michael Gottstein along with Peter Leonard and his staff in Mayo.

Table of Content

Options for finishing hill lambs

Michael G Diskin, Noel Claffey & Frank Hynes,
Teagasc, Mellows Campus, Athenry, Co. Galway.

The Scottish Blackface breed accounts for approximately 22% of the 2.5 million ewes in Ireland. 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 August onwards. In recent years, prices for hill lambs and in particular light hill lambs have been disappointing. This paper briefly examines 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

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 preferences for carcases from 12 to 15kg. While hill lambs meet these weight requirements, demands from these markets have declined in recent years. 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.

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. However, general performance trends are similar with both lowland and hill lambs. Many hill lambs are sold to lowland finishers and reappear in the spring as hoggets.

Performance at grass

Post weaning performance at grass very much depends on quantity and quality of grass available. Results from Teagasc studies would suggest that well grown weaned hill lambs on well managed pasture can achieve approximately 115 g/ day or 0.8 kg / week in early autumn, (August / early September) while in late autumn, (Sept /October) this performance drops to 0.4 kg / week. Growth rate of lambs on hill pastures will be 50% below these levels. Furthermore, if the weaned lambs are very light, less than 25 kg, at this time of year performance will be depressed further.

Options for dealing with hill lambs

A number of options are discussed in terms of their advantages, disadvantages and expected lamb performance

Option 1: Sell at weaning

Advantages:	Disadvantages
Extra grass made available for ewe lambs and breeding ewes	Poor prices for light lambs
Savings on flock health costs	Limited markets
Improved cash flow	Lamb potential not exploited by primary producer

Option 2: Graze and sell at end of October

Requires excellent quality grass and grassland management

Advantages	Disadvantages
Heavier lambs	Less grass for ewe lambs and breeding ewes
Greater sale options	Additional flock health costs
Possibly higher prices	Cash flow?

Expected Lamb performance

August – Mid-Sept: 115g/day or 0.8kg/week
Mid-Sept –End of Oct: 60g/day or 0.4 kg/week
Total liveweight gain: After 12 weeks = 7.2 kg

Option 3: Graze + Supplementary meal feeding at pasture and sell end of October

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

Advantages	Disadvantages
Heavier lambs	Less grass for ewe lambs and breeding ewes.
Greater sale options	Additional flock health costs
Possibly higher prices	Cost of concentrates (€6.30/lamb)
	Cash flow?

Expected Lamb performance

August – Mid-Sept: 155g/day or 1.1 kg/week
Mid-Sept –End of Oct: 100g/day or 0.7 kg/week
6-9kg concentrates required for 1 kg liveweight 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 market at the end of October pay or the additional 4 kg of liveweight.

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

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

Advantages	Disadvantages
Extra grass for ewe lambs and breeding ewes.	Cost of meal
Heavier lambs	Large quantity of meal required
French lamb prices	A long finishing period for light lambs
	Additional flock health costs
	Facilities
	Cash flow?

Expected Lamb performance

Average daily gain: 200g/lamb/day

Feed Conversion efficiency: 6.5-7kg Meal: 1 kg liveweight gain.

Market suitability: 90+% of the lambs should reach French market specification.

The profitability of this is very dependent on the following factors:

- **The market price** or valuation for lambs at weaning.
- **Meal prices.** These can be variable depending on location, quantities, ration composition and whether it can be purchased in bulk or bags. A high quality balanced ration suitable for feeding to finishing male lambs must be used.
- **Lamb mortality**: Ideally this must be kept below 4 %. Starting off with healthy lambs followed with good husbandry is essential.
- **Sale price** of finished lamb. Starting the intensive feeding of lambs in August – September will result in a high proportion of lambs being finished in November-December probably before there is a worthwhile increase in factory lamb prices.

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	Disadvantages
Heavier lambs at start of meal feeding period	Less grass for ewe lambs and Breeding Flock.
Reduced meal requirement	Additional flock health costs
French lamb prices	Facilities
Higher prices in January-March.	Cash flow?
Reduced finishing period	

Expected Lamb performance

Grazing:	12 weeks grazing = 7.2 kg liveweight gain.
Indoors:	Average performance =200g/day.
Feed Conversion Efficiency:	6.5-7kg of meal: 1 kg of liveweight gain
Market suitability:	90+% of the lambs should reach French market specification.

The finishing of lambs is very dependent on the following discussed under Option 4. With this option cheaper liveweight gain is achieved from grazed grass and the quantities of meal required are less. By starting the finishing period later there is a greater probability lambs ben sold in Jan when hogget prices usually

Performance of Hill and Crossbred lambs at Athenry 2013-2014

The performance of Hill and Crossbred lambs at Athenry 2013-2014 is summarised in Table 1. Lambs were kept indoors for the duration of the feeding period and fed a ration comprised of 70% cereals; 15% protein and a UFL of 1.00. Total lamb mortality was 3%.

Table 1. Performance of Hill and Crossbred lambs at Athenry 2013-2014

	Scottish Blackface		Texel x Scottish Blackface	
	Light	Medium	Light	Medium
Starting weight (kg)	24.8	29.1	24.9	29.9
Days on diet	73	61	65	60
Slaughter weight (kg)	39.0	40.4	41.9	43.1
Total meal intake (kg)	89.4	72.6	82.2	77.6
Daily intake (kg)	1.24	1.19	1.26	1.3
Average Daily Gain (g/day)	206	197	277	230
Feed Conversion efficacy (FCE) Liveweight Gain (kg)	6.39	6.80	4.61	5.73
Feed Conversion efficacy Kg meal / Carcass Gain (kg)	12.01	11.82	12.198	12.084
Carcass weight (kg)	17.10	17.60	17.41	19.26
Carcass Conformation % 'U' % 'R' % 'O'	 0% 80% 20%		 20% 80% 0%	
KO%	43.81	43.63	41.60	44.60
% Carcass > 15 kg (French	96		100	

The impact of varying meal prices, factory lamb price and mortality on Margin per lamb is presented in Table 2.

Table 2. The impact of varying meal prices, factory lamb price and mortality on margin per lamb

	Lamb starting Weight (kg)		
	25	30	35
€ 20 increase in meal price	€-2.31	€-1.55	€-1.05
20 cent increase in lamb factory price	€ 3.70	€ 3.70	€ 3.70
1 Percentage point increase in lamb mortality	€ 0.42-0.52	€ 0.50-0.65	€ 0.65-0.80

The impact of changes in meal prices is most significant when feeding lighter lambs and aiming to bring them to "French" weights reflecting the fact that they require larger meal inputs. Increasing factory lamb price has a consistent effect across the different lamb weight ranges. The impact of increased lamb mortality is greatest with heavier lambs reflecting the increased value of a heavier lamb at the start of the feeding period.

Effects of gender (rams vs wethers) and breed (Scottish Blackface v Texel crosses)

Data from an on-going study at Athenry on the effects of gender and breed for a number of important production variables are summarised in Table 3.

Table 3. Effects of gender (rams vs wethers) and breed (Scottish Blackface v Texel crosses) on lamb performance

	Scottish Blackface		Texel Crosses	
	Rams	Wether	Rams	Wether
Daily intake (kg/day)	1.27	1.28	1.52	1.50
ADG (g/day)	223	205	334	281
FCE (Kg Feed /Kg liveweight gain)	6.53	6.63	4.78	5.64
KO%	44.9	46.4	47.1	48.9
Carcass Conformation Score	2.40	2.6	3.5	3.6
Carcass Fat Score	3.60	4.3	3.2	3.80

Texel cross lambs had higher daily feed intakes, and higher average daily gain (ADG) than Scottish Blackface lambs. The effects of gender (rams vs wethers) on feed conversion efficiency (FCE) and ADG was much more pronounced in the Texel cross lambs but interestingly not in the Scottish Blackface lambs. Kill out % (KO) was lower in the Scottish Blackface lambs and was about 1 to 1.5 percentage points lower for ram lambs compared to wether lambs. Scottish Blackface lambs had significantly poorer conformation than Texel cross lambs with rams lambs of both breed types trending to have poor conformation. Than wether lambs for both breed types were fatter.

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.

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 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. Greater than 90% of male Scottish Blackface

lambs are capable of producing carcasses of > 16kg. To improve the economics of the system the objective should be to maximise the lamb gain from autumn pasture. The latter requires excellent sheep husbandry to minimise lamb loss and maximise lamb performance. It's vital to be able to obtain a quality ration at a competitive price. The ration must be formulated for intensive feeding of lamb.

Feeding of the hill ewe

Shane McHugh,
Teagasc, Ballyhaise, Co. Cavan.

In Ireland the hill ewe flock plays an important role in the overall sheep sector. It has an important role in the maintenance role in many hill and mountainous terrains. The 2013 national sheep census estimates that Scottish Blackface and Cheviot Hill breeds accounts for a total of 791,552 ewes (Table 1). This represents 32 % of the total national ewe population. The hill ewe population is predominately located in the hill areas along the western sea board from Donegal to Kerry, Wicklow, Waterford, Tipperary, Cork and Louth.

Table1. Number of hill ewes declared in 2013 national sheep census

Type	Number
Blackface & Cheviot Ewes	791,552
Blackface X Cheviot Ewes	490,489

The hill ewe flock is predominately bred pure with the main breeding objective to produce replacements for its self and a secondary objective of producing quality crossbred replacements for the lowland flock. Traditionally the latter has been a major contributor to the lowland flock replacements in certain parts of the country. The ram/wether lambs from the hill flock has the potential to be finished on many lowland farms to french carcass weight specification. National farm survey reports indicate that productivity from the hill flock nationally is low and the average number of lambs weaned per ewe put to the ram is about 0.8 lambs. The number of lambs reared per ewe put to the ram is a key driver in the profitability of both the hill and lowland sheep sectors. This paper will examines the role ewe nutrition a hill farm situation and as well as examining different supplementation options prior to lambing.

Effect of ewe live weight and condition

The Teagasc Sheep BETTER Farm Programme has recently quantified the effect ewe condition and weight at mating on subsequent litter size and pregnancy rate in hill ewes. The hill flocks comprised Scottish Blackface ewes. There is a direct relationship between increasing ewe body weight at mating and subsequent litter size see (Figure 1; Diskin and Lynch 2014) As part of the BETTER farm programme great emphasis has been placed on maximising the use of all the available green/field land at crucial times of the year. Before mating and again at lambing the available green land is critical in having feed available to to improve weight at mating and thus

ewe productivity. This is particularly true for ewe replacement, young and light ewes However, this option of using green land will vary between farms (Lynch & Diskin 2014). Once Scottish Blackface ewes exceed about 47 kg at mating there is a significant improvement in the proportion of these ewes that subsequently produce twin lambs (Figure 1). It is clear from Figure 2 that pregnancy rate is optimised when ewes are in a moderate body condition score (Score 3) at mating. Very thin ewes have low pregnancy rates and therefore end up as barren ewes in the subsequent year. Further analysis shows that the majority of ewes which would turn up light and thin are either hogget or old ewes (Lynch and Diskin 2014).

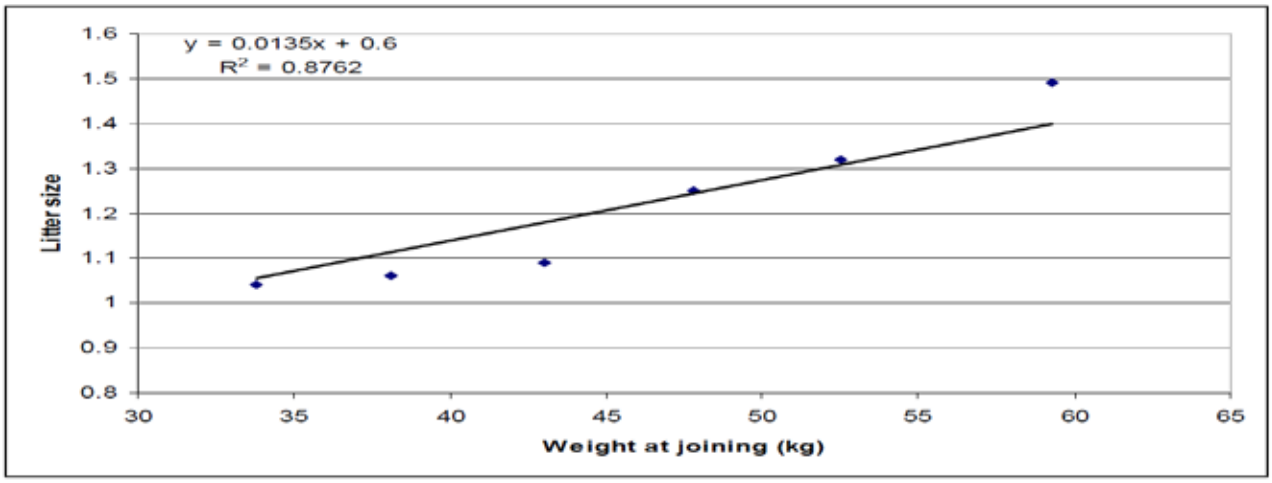

Figure 1.Relationship between ewe weight at mating and litter size in Scottish Blackface ewe

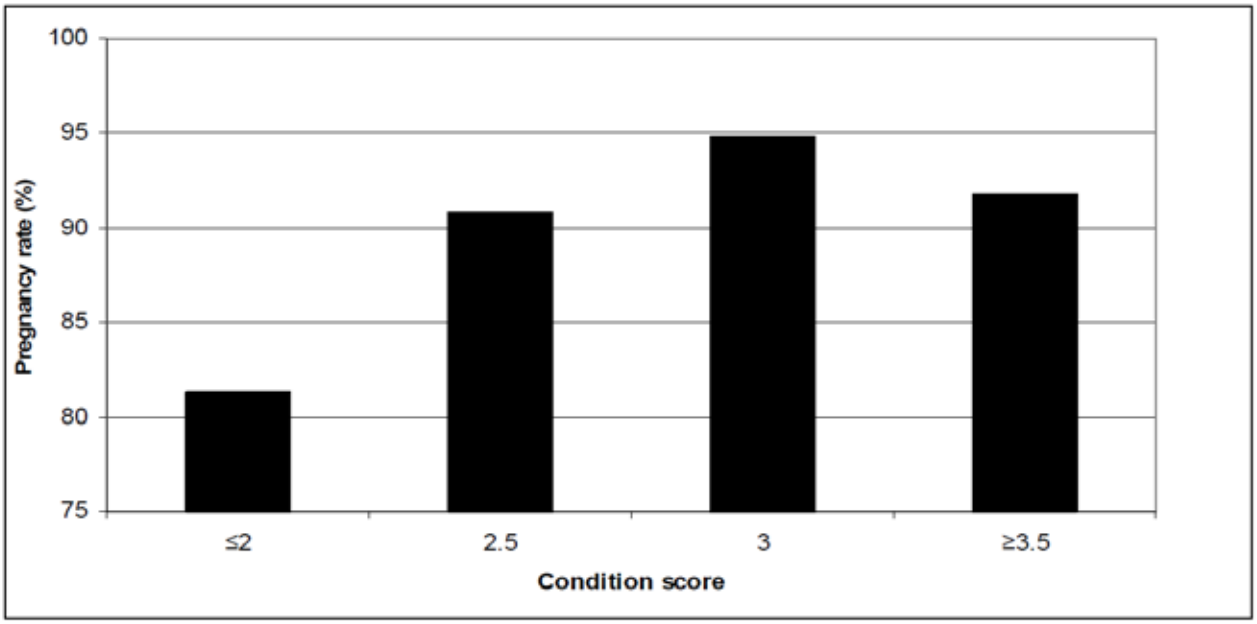

Figure 2. Pregnancy rate of ewes in different condition score at mating on the BETTER farm hill flocks

Management of the hill ewe before lambing

Pregnancy Scanning

Pregnancy scanning is a very useful management tool and is helful in making key decisions with respect to ewe nutrition before lambing. It allows for separation of ewes according to their litter size and also any barren ewes are identified. Ideally scanning should take place between days 50 to 90 of pregnancy.

Separation of ewes

At scanning or eight weeks from start of lambing, ewes should be separated according to their predicted litter size and body condition. On farms where feed supply and quality are poor the condition scoring of ewes may need to take place earlier than eight weeks pre-lambing to avoid body condition loss. In hill ewes any multiple bearing ewes and ewes which are in body condition score of 2 or less (thin) should be separated out for extra feeding prior to lambing. Adequate nutrition of the ewe during pregnancy is of paramount importance to the survival and viability of all lambs conceived. This requires that the increased demands in nutrients in late pregnancy are met from a combination of body reserves, supplementary feed and grazing. In the late stages of pregnancy the energy and protein intake of the ewe should be increased to match the ewes increasing requirements for the developing lambs and for colostrum production. About 70% of the foetal growth takes place in the last 6 weeks of pregnancy (Figure 3).

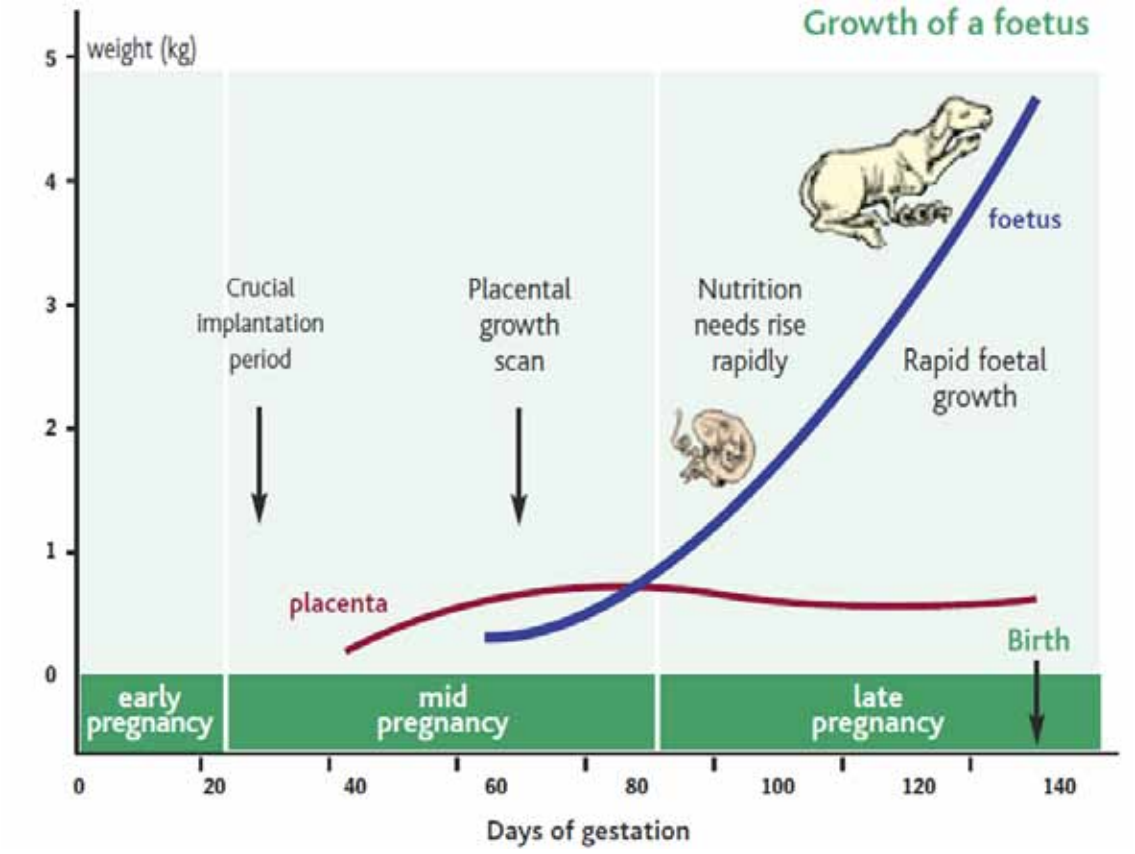

Figure 3. Growth of the foetus. Source Eblex Sheep Manual

Consequences of underfeeding in the last two months of pregnancy:

The consequences of inadequate feeding are outlined below:

- Thin ewes
- Small weak lambs
- Poor supply of colostrum
- High lamb losses
- Poor milk yield.
- Extra labour

The energy and protein requirements for a 50 kg ewe in good condition are outlined in Tables 2

Table 2. Energy requirements for a 50 kg ewe in good condition*

	Dry	Early & Mid pregnancy	6 - 5 wks pre lambing	4 - 3 weeks pre lambing	2 - 0 week pre lambing	2 - 6 weeks Post Lambing
Energy UFL/d	0.67	0.67	0.71	0.85	1.05	1.87
Protein g/day	95	150	112	196	390	300

* assumes lambs gaining 225 g/day post lambing

Options for supplementing ewes

Hill sheep farmers are faced with a choice of feed supplements and very often the decision as to what form of supplementation is based on the limitations of the farm and also the constraints of the farmer eg. work, commitments, accessibility to the hill. The level of supplementation will also be dependent on the quality and amount of forage available on the hill or lowland fields where ewes may be moved prior to lambing.

Concentrate feeds

The range of compound feeds is huge and there are wide differences in quality and price. As a general rule the better the quality the better the value for money. Compounds may be purchased as pellets, cob nuts or coarse rations. The classification of ingredients used in rations in terms of quality is presented in Figure 4.

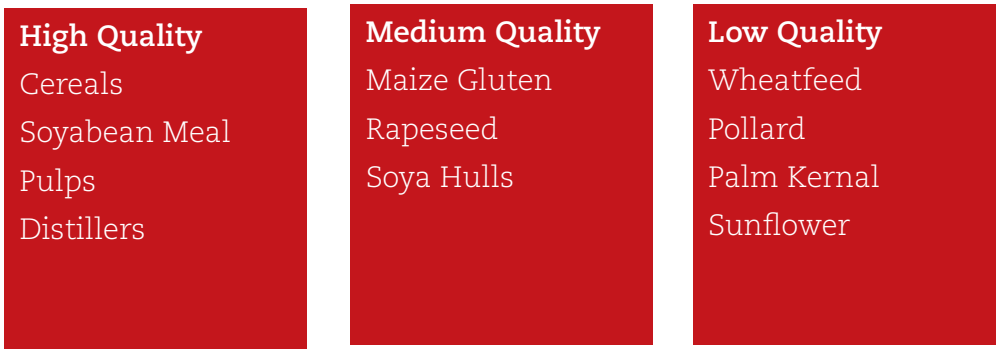

Figure 4. Classification of ration ingredients in terms of quality

These are broken down into high, medium and low quality ingredients. It is important to look at the list of ingredients on every feed label as these are given in descending order of inclusion. If barley makes up the largest part of the compound ration this would be at the top of the list, and with minerals, present in the smallest amounts, are listed at the bottom of the list.

Energy Buckets

Energy blocks/buckets can be useful when feeding in extensive grazing systems. They reduce daily labour requirements and ensure a constant supply of supplementary feeds in difficult conditions. Similar to compound feeds the energy blocks label should be checked to determine the energy content of the feed.

Silage/Hay/Haylage

Conserved forages such as silage, hay or haylage are not always available on hill farms but where fields or lowland is available effort should be made to have some conserved forage available for the feeding of ewes during storms or snow. Quality forage is a useful feed for ewes which are thin or multiple bearing along with a high energy compound before lambing. The quality of forage is very often variable and should be analysed to determine the quality. A concentrate feeding regime should be matched to the fodder analysis.

Table 4. Silage/Hay energy levels

Grass Silage/Hay	UFL (per kg DM)
77%DMD	0.87
72%DMD	0.81
68%DMD	0.76
64%DMD	0.71
60%DMD	0.66
56%DMD	0.61
Good Hay (60 DMD)	0.69
Poor hay (52 DMD)	0.58

Source Hynes 2013

Liquid feeds (Molasses)

Liquid feeds can very useful when feeding in extensive grazing systems. They reduce daily labour requirements and ensure a constant supply of supplementary feeds in difficult terrains. Molasses is high in energy supply but is quite low in protein and, therefore, ewes from three weeks prior to lambing require an additional protein supply with molasses to meet their protein requirements.

Feeding Options and Labour Input

The total cost of feeding hill ewes using different feeding methods are of interest to many hill famers. Vipond, (2012) has examined the labour input required for 3 different feed options for hill ewes.

A 1000-ewe hill flock was fed using:

- 30 block sites (1 block (22.5kg) per 30 ewes/week (110g/day)
- 6 six ball (200 l) Multifeeders for liquid feed allowing 250ml/ewe/day
- A snacker feeding at 3 sites every day giving 280g/day per ewe

The feed blocks are replaced weekly, liquid feed twice weekly and concentrates fed daily. In terms of nutrients supplied, the blocks supplied 12% of a hill ewe's daily energy requirements and the liquid and concentrates both supplied 21% of the ewe's requirements.

Table 3. Costs for different option

Feed Type	Specification	Daily Intake	Frequency feeding	Feed cost (€/t)
Blocks	High energy block	110g	1x week	438
Liquid	Sheep liquid in Multifeeder	250ml	2x week	271
Concentrate Ex snacker	€1250 Logic	280g	7x week	240

Total costs for a 1000 ewe hill flock

David McLaughlin is a participant in the Teagasc BETTER Farmer Hill Sheep programme and his Flock Feeding and Grazing Regime is outlined below:

- January – All ewes grazed on hill except for thin ewes
- February- Ewes fed 2 -3 times per week on the hill at rate of 0.2kg./day of concentrates.
- Mid February - Ewes scanned.
- Twin bearing ewes and any thin ewes removed to lower land
- Ewes with Singles: Fed 2 -3 times per week on the hill at rate of 0.2kg./day with concentrates
- Ewes with twins: Fed 0.2kg./head every second day until March 1st and every day from then until lambing.
- March 1st. Singles are brought to low hill ground, fed every day at rate of 0.2kg./day with concentrates until lambing
- April – Before lambing commences all ewes put on rested grass in fields with no meal

Conclusions

- The hill ewe flock in Ireland contributes to both the maintenance of the hills and provides a supply of store male lambs, ewe lambs, crossbred ewe lambs and ewes to lowland sheep farm.
- There is a direct relationship between increasing the body weight of the hill ewe at mating and her litter size and pregnancy rate. This provides hill sheep farmers with great scope in increasing the number of lambs weaned per ewe put to the ram. The strategic use of all green land available prior to mating and lambing in crucial.
- Pregnancy scanning of hill ewes is an important tool in the management of pregnant ewes.
- Separation of ewes based on litter size and condition score is important. Feeding of these ewes additional feeds prior to lambing will greatly increase the output from the ewes.
- Supplementary feeds should be assessed as regards their energy and protein content. As a general rule the better the quality the better the value for money.
- There are different feeding options available to hill farmers and the best suited to the farmer's conditions and commitments should be selected.

Acknowledgements : The assistance of G.Howard is greatly appreciated.

References :

Hynes F. (2013) Concentrate supplementation of pregnant ewes with an emphasis on late pregnancy nutrition

Lynch C.O. & Diskin M.(2013) Improving the Productivity of Hill Sheep Flocks

Lynch, Cannon, Hynes & Diskin (2013) BETTER farm Hill Open Day

Vipond, J.(2012) Total Supplementary Feeding Costs of Outwintered Ewes SAC

Marketing hill lambs: the Mayo story

Tom Staunton[a], Tom Staunton (Junior)[a], Frank Hynes[b], John Noonan[c]

[a]Toumakeady, Co. Mayo. [b]Sheep Specialist, Animal and Grassland Research & Innovation Centre, Teagasc, Mellows Campus, Athenry, Co. Galway. [c]Teagasc, Newport Road, Westport, Co. Mayo.

Tom Staunton lives in Toumakeady, Co. Mayo on a picturesque location overlooking Lough Mask. With his wife Maura he reared six children; three boys and three girls. Farming has provided the main source of income since Tom took over the family farm in 1980. Income is also supplemented by agri-tourism. Over the past 35 years, much of Tom's time has been devoted to innovative ways of maximising the returns from his business and for other farmers in his community. This he has done through the establishment and active participation in a number of groups through which quality livestock are produced and marketed.

Farming

Tom farms 66 hectares, with 36 hectares being owned and 30 hectares rented. Tom classifies 40 hectares of this land as being average to good quality for the area with the remaining 26 hectares being rough grazing.

Tom keeps 350 Blackface Mountain ewes and 90 replacements. He also has a flock of 20 purebred Bluefaced Leicester ewes which are used to produce rams for sale. When replacements and rams are included this gives a stocking rate across the whole farm of over 7 ewes per hectare. The ewes on the farm are Mayo cross Lanark type. Ewes are usually scanned about 70 days after ram turnout and typically scan at 1.6 lambs per ewe mated. However, the ewes that do not show up as in lamb at that stage are separated and allowed run with a ram for a number of additional weeks. This gives an extra crop of lambs and increases the overall lamb crop for the farm.

Main Farm Enterprise

The main sheep enterprise on the farm is the production of Mule ewe lambs. These are sold at special sales organised in the area. Tom produces well-grown lambs to reach 45-50kg liveweight for the breeding sales in August. They are sold for breeding in their first year and consistently command a premium price. Male lambs are castrated and the wethers are sold as either forward stores or fattened and ready for slaughter.

When it comes to running his sheep enterprise on his own farm, Tom places a major focus on the production of ewes that have lots of milk, giving the lambs the best possible start in life. He takes great pride in the livestock he produces and is happy to stand over his produce. He believes the information that is now available through recording with Sheep Ireland will make it easier for him and other farmers to identify key maternal

Figure 1. Farmers working together to market their livestock is key to maximising returns

traits over the coming years. This will help farmers make better and quicker genetic gain than was possible in the past, especially for pure-bred flocks.

Group Approach

Tom has a strong belief in and has been very much involved in group work for many years. He was a key driving force in the establishment of a number of groups as well as an active and committed participant.

Mayo Male & Grey Face Group

In 1984, Tom became involved in a project which aimed to produce quality productive ewes for lowland sheep farms. The project was supported by the Department of Agriculture and ACOT (now Teagasc). The local Mayo Blackface ewes were mated with Bluefaced Leicester rams to produce Mule lambs. A special sale was organised to sell the female progeny. The initial sales had approximately 100 specially bred ewe lambs. The Department of Agriculture remained involved for four years. After that, the project was handed back to the farmers with the assistance of ACOT.

The reputation of these Mule and Greyface (Border Leicester cross) ewe lambs has grown steadily over the years. Annual sales are now approximately 4,000, including ewe lambs and ewe hoggets. These take place at Aurivo Mart, Ballinrobe on two separate dates during August and September each year (Figure 1.). These sales are recognised all over the country for the high quality of breeding stock that is available for purchase. In 2014, breeding stock were purchased by buyers from 20 different counties throughout Ireland. There are currently 51 members in this group. All of the sheep sold at these sales are

Figure 2. Farmers take pride in the stock they produce and sell through their Group

produced from within this group of farmers and in the local area. Seventy per cent of the members produce and sell ewes lambs with some also selling ewe hoggets. The remaining 30% of farmers sell ewe hoggets that they have purchased the previous year at these sales as ewe lambs.

The Mule/Greyface Group is run by a strong dedicated committee who meet regularly. They use every available opportunity to promote their produce taking sheep for display at shows such as Tullamore, Clonmel and many other shows. They also regularly feature in local and national press as well as local radio. They maintain accurate records of all buyers at sales and these buyers are invited back to the sales organised the next year. This Group celebrated its 30th Anniversary last year (2014) and are proud to be selling a high value product worth a premium of €40 to €50 over their male counterparts.

South Mayo Lamb Producer Group

While Tom's primary enterprise is the production and sale of quality breeding stock, he also produces a significant number of lambs for slaughter. These include the male lambs plus the females that do not make the breeding grade. Tom's concern about farmers not being adequately rewarded for producing top quality lambs led him to join with some like-minded farmers in 1987 to establish the "South Mayo Lamb Producers Group". This Group currently has 186 members. They supply over 12,500 lambs annually. There is an active committee of 12 members who negotiate a deal annually for the members. Through this group, farmers receive a better price through quality bonuses and subsidised transport costs.

Farmers regard this as a very convenient method of selling lamb. Other benefits offered by the Group include negotiated deals on the purchase of concentrate feed and a co-ordinated approach to selling pet lambs.

Mayo Mountain Blackface Group

In 2004 a separate group, "The Mayo Mountain Blackface Group" was set up. This Group was initially setup to provide buyers with a sale that offered substantial numbers of quality Blackface sheep. The sale has grown over the years selling 1800 females at premium prices in 2014. The group has diversified and grown to 240 members in the Group selling 10,500 lambs annually. Areas addressed by the group includes markets for light hill lambs, finding buyers for store lambs for further feeding, selling lowland factory lambs and sales of pure-bred Mayo Blackface females as replacements on lowland and upland farms throughout the country. The Group cooperates with the Mayo-Connemara Blackface ram group established in 1961, where they have their annual sale with the breeding sale on the last Saturday in September. This Group operates under a strong committee of ten members. Similar to the Mule / Greyface Group a premium price is being achieved for breeding stock put through the Group. The Group aims to ensure farmers work together with a common goal of producing quality breeding stock. They strive to promote the Mayo-Connemara Blackface mountain breed as a purebred ewe and as a dam for producing crossbred ewes for lowland farmers.

There is a MALP programme in the area run by Sheep Ireland. This involves farmers from The Mayo-Connemara breed recording programme, the Mayo Blackface Mountain group and non-group members. These are all working together to enhance, protect and improve the native sheep in the region.

Umbrella Group- Lake District Sheep Producers

The three groups identified above operate under one umbrella known as the "Lake District Sheep Producers". This group provides administrative support, with two staff being employed each working 19.5 hours per week giving a total of the equivalent of one full labour unit. This initiative is funded by a Rural Social Scheme (RSA). Furthermore, an office is rented which is funded by farmers in the Group. Tom is confident that this office and clerical support is a major key to the success of the Groups and pays great tribute to the dedicated staff involved.

Key Success Factors

Tom identifies a number of key factors that lead to the success of all three Groups.

- Quality stocks are produced. An emphasis is placed on having ewes in good body condition in the autumn
- Farmers take pride in the stock they produce and are happy to stand by their produce.

- A strong commitment from investors is a must. To ensure this continues, rigorous rules are set out and strongly enforced.
- Each group has a strong committee to drive the activities, leading to approximately 500 farmers being satisfied due to the good service they receive.
- Detailed analyses of each members lambs and what they produce.
- Strong marketing effort, with accurate records being kept on all buyers.
- Regular use of media and other opportunities to promote the produce.
- Keeping abreast with technological changes including having an internet site for all three groups.
- People involved must enjoy the enterprise they work in, if they are to remain committed to it.

The future

Tom identifies a number of key factors that are important on an on-going basis and into the future including:

- Strong leadership by the committees with key people required to drive the groups.
- Innovation is important, with vision to identify new opportunities.
- Mistakes will be made but it is important to learn from these mistakes.
- Members and especially those driving the initiative must not become complacent.
- Focus on constant improvement.
- Treat all members equally.
- Help members maximise production at farm level. To this end the adoption of technology is encouraged at farm level. Strong support from Teagasc in terms of technical events is encouraged and welcome.

New initiatives

Tom identifies a number of key areas that need to be addressed into the future. This includes issues that farmers should deal with at individual farm level, as well as group and industry issues.

On farm initiatives

At farm level much progress can be made by improving grassland management. Mineral imbalances such as cobalt deficiency need constant attention. Many farmers have sheep sheds on their farms that are used for relatively short periods each year. These sheds could be used effectively to deliver a financial return by fattening store lambs indoors on concentrates. Recent research work at Teagasc, Athenry provides good guidance on what is achievable. These lambs could well be home produced lambs that are usually sold as stores, or they may be lambs bought in as stores for further feeding. Labour is always an issue on sheep farms. Farmers should address this by improving fencing

and providing proper sheep handling facilities. Schemes such as TAMS provide great opportunities and farmers should take advantage of them.

Industry Initiatives

Better dialogue between farmers and the meat industry, including processors, supermarkets and other customers is necessary as farmers need greater certainty regarding the price they expect for the product they produce. Greater diversification and product development to make lambs meat more attractive to younger consumers is required. Opportunities to exploit niche markets must be explored. Research is required to explore the effects of different diets on meat quality. Greater co-operation between lowland and hill sheep farmers and cattle farmers is required with greater potential to exploit available grass for fattening lambs.

Concluding Remarks

Income from hill sheep is low, especially where the amount of available lowland/ grassland is limited. Much work is needed to maximise the output from these limited resources. However, by maximising output through careful management and with all the sheep industry working together the future can be much brighter. for everyone

Maintaining a high standard of health in hill flocks including vaccination and parasite control

John Fagan MVM MRCVS,
Senior Research Officer, Regional Veterinary Laboratory, Athlone.

Acute liver fluke

Liver fluke is a major disease of sheep here in the west of Ireland, and continues to cause significant losses in flocks especially when sheep are brought off the hill. In a regional veterinary laboratory on a bad year for fluke, the first losses from acute fluke will be seen in late August/early September. In the case of acute fluke the fluke larvae travel through the substance of the liver causing significant haemorrhage and blood loss. The animal becomes anaemic, slow in the walk and in some cases drops dead. The sudden deaths usually occur following the rupture of the capsule of the liver associated with bleeding. These problems don't usually occur in ones or twos but in multiples. So, if sheep deaths start to occur from early September producers should be suspicious of fluke. It's wise to confirm the suspicion by having a post mortem examination done by your local veterinary surgeon or regional veterinary laboratory. If the condition is confirmed the producer now needs to consider what appropriate action to take. It's wise to discuss the situation with your veterinary surgeon or advisor who knows your farm well. The flock comrades must be dosed with a fluke dose that kills early immature fluke larvae. [Remember that not all fluke doses are the same, some only kill adults which is useless in the early autumn when there are only larvae present in the sheep, while some kill larvae down to about 2-3 weeks old. ***So make sure that you use the right dose at the correct dose rate.]***

What about the land they are on, are there wet spots, pools or areas where the snail that carries fluke larvae can live? Have you got drier ground anywhere that they can be put on and be exposed to less fluke larvae? If so, put them on it. If not, you have to remember that once the sheep go back on the land after dosing that they continue to pick up fluke larvae at the same rate as before dosing. So, on a wet year you are in for very frequent dosing, i.e. once a month. (In fact during those very wet years e.g. 2012, there were farms in parts of Ireland that with all the dosing in the world you could not keep sheep alive on.) Right, now you have had your outbreak, confirmed as liver fluke, gave the right dose and moved the animals, so everything will be fine. Well, maybe not, if some sheep had livers so badly damaged that it caused them to die there'll be more in the flock with varying degrees of damage to their livers. The trouble won't end over- night. Even with a very efficient dose some more deaths

may occur. The liver damage already done will continue to cause problems if the damage is significant. Some of these sheep will thrive poorly and may even die weeks or months later. We have seen lambs in the laboratory that died the spring after an outbreak of acute fluke that had occurred in the previous autumn. In these cases the livers tried to repair but there was too much damage done. In addition further complications can occur – sheep with damaged livers may be more susceptible to twin lamb disease, salmonellosis, Black disease or may not have enough milk for their lambs.

Chronic fluke

Not all fluke that occurs in sheep is acute fluke disease i.e. caused by larvae, chronic fluke also occurs which is caused by adults. In these cases infestation levels will be lower, the fluke larvae will mature and settle in the bile ducts and produce eggs which will be passed in the faeces and can be detected in a laboratory test. In general by December of any year the fluke can have matured and be passing eggs. If you have scouring sheep, poor thrive, some with a swelling under their chins check out the fluke situation. Faecal examinations are useful at this time to detect eggs. Dosing and moving will apply as previously and it's still advisable to use a drug that kills immature fluke. If you house sheep, dose 6 weeks after housing with a dose that kills early immature fluke ie < 6 weeks.

Recommendations for fluke treatment are as follows:

- Outwintered sheep on a "flukey" farm - doses in November, Feb, April.
- Outwintered sheep on a very "flukey" farm – dose monthly September onwards.
- Housed sheep - dose 6 weeks after housing with a dose that kills early immature fluke ie < 6 weeks.

In summary liver fluke is a serious disease causing significant losses in sheep flocks, and farmers need to be constantly vigilant. Get as much information about the fluke status in general and also on your farm (factory reports). Get advice from veterinarian and/or advisors. Devise a plan suitable for your farm for that year. Review the plan each year.

Resistance to flukicides

What if after dosing you observe that sheep continue to die without any improvement, could there be resistance to the drug present. So far in Ireland, we have only seen resistance to one drug, but that drug is the most effective against immature fluke (where it works) This leaves producers in a very difficult situation. Our advice would be to try to minimise the amount of doses you need to use, by other measures (drainage, fencing, keeping cattle rather than sheep on the most 'flukey' parts of the farm. **We would also recommend that you regularly check that your dose has worked by checking a dung sample for fluke eggs. If it hasn't worked you need to consider if a flukicide resistance problem exists on your farm.**

Dept of Agriculture Laboratories don't offer routine dung testing services, but the Animal Health Ireland website lists those private labs that offer these services:
See:http://animalhealthireland.ie/ckfinder/userfiles/files/20111018%20Parasite%20DiagLab%20Web%20list%20(Final).pdf

Rumen fluke

You will have heard talk about rumen fluke and may have wondered about it. Our experience, based on laboratory observations, was that during the wet years it caused significant problems which were caused by the larvae. Deaths in sheep and cattle from a severe scour were recorded. Once it was correctly diagnosed the response to treatment was quite good. Since 2012 the position is that we see rumen fluke eggs in many faeces samples but don't associate significant disease problems with them. This is because it is considered that in light infections the adult form of the parasite doesn't cause disease. **However, if you get a laboratory report of rumen fluke eggs in your sheep faeces, if they are scouring and haven't responded to** treatment for liver fluke or worms treat them for rumen fluke**. *There are no specific recommendations to prevent rumen fluke other than keeping sheep out of high-risk parts of the farm, as for liver fluke.***

Gastro-intestinal worms

In the hill farming situation gastro-intestinal worms must be considered when lambs are brought to lowland parts of the farm. Dosing of the lambs will be required if they are grazing on lowland pasture. In general, the stocking rates on hills are too low for lambs to pick up significant burdens, but every farm is different, and if there are pockets of grass pasture on your hill pasture, these may be heavily grazed, and may be a focus of infection with worms.Where lambs have grazed on lowland, the advice would be to dose lambs a month after they have been brought down to lowland ('green land'). And after that, the number of doses will depend on the level of challenge by parasites and the performance of the lambs. Remember that lowland pasture, which is of key value in finishing hill lambs is also the key area for worms, and if there is an option to rotate silage ground and pasture, this will reduce the challenge.

Remember also that if anthelmintics are used too often, it will encourage the selection resistant strains of worms and the doses will stop working. This is becoming an increasing area of concern, and there are farms where this is now a serious problem. Sometimes these farms are now having problems with two of the wormer classes. To keep this nightmare scenario at bay, consider some simple measures to retain susceptible worm strains on your farm:

- Do worm egg counts regularly – you may be able to defer a dose and pocket the saving
- Dose a few days after moving lambs to clean pasture, or dose them a few

days before they leave 'dirty' pasture
- Don't dose the best-thriving lambs (they clearly don't have a worm problem and will seed the pasture with non-resistant worms)

There are many other aspects to this – see http://www.scops.org.uk/ for a lot more information on keeping resistance to wormers at bay.

Pasteurella

Another issue that we in the laboratory over the years associate with hill lambs is outbreaks of pasteurellosis after they have been moved onto lowland farms. Usually about a week after arriving on the farms sudden deaths start to occur which can be very frequent for a few weeks. After diagnosis by post-mortem examination and subsequent vaccination the problems usually stop a week or 10 days later. It's a situation that could have been prevented if the vaccination had been carried out before the movement. The multivalent clostridial vaccine with the Pasteurella component is the best vaccine to use to prevent both clostridial and pasteurella deaths.

Clostridial diseases

Clostridial diseases like liver fluke are a constant threat to sheep. We see pulpy kidney disease in lambs from about 4 weeks old. Clostridium sordellii is a more recent finding which affects the stomachs of lambs from about 3-4 weeks of age and results in deaths. In older sheep a liver condition called black disease results in deaths especially in "flukey" years – it is carried in from the soil by the fluke. Other clostridial diseases that cause sheep/lamb deaths are braxy and malignant oedema, lamb dysentery. Vaccination is a wise course to follow and if you decide to carry it out include the Pasteurella component. In general this involves an initial course - two shots 4-6 weeks apart followed by a yearly booster of ewes 4-6 weeks before lambing to boost immunity in lambs. Lambs may be vaccinated from 3 weeks of age.

Swayback

Swayback is a condition in lambs that causes the loss of power in the hind limbs and results from copper deficiency. Most of the cases we have seen over the years were in lambs from hill farms. Also some of the lowest blood coppers we have seen were also from hill sheep. So it's wise to check out the copper status of your sheep by having bloods or liver tissue tested. Remember that copper is a toxic element and over-supplementation can lead to poisoning. Talk to your vet or advisor about this and make sure that you supplement correctly.

Cobalt deficiency

Another element that you may have to supplement with is cobalt – all of the soils around here are cobalt-deficient. If you're having poor thrive, loose wool and scouring in lambs in early autumn consider supplementing with cobalt. Laboratory tests for liver cobalt only

are available. Oral supplementation will show a response if it's required. Make sure it is given at the recommended rate. Get advice. Remember if your sheep need cobalt, then they need it often – bigger doses risk toxicity, and its not stored in the body. **So dose with the correct amount, and dose frequently is the prescription here.**

Tick-borne diseases

Two tick-borne diseases, tick pyaemia and louping ill, are other conditions that we regularly see in the laboratory and are associated with hill sheep. Tick pyaemia occurs when lambs are infested with ticks and the tick bites lead to abscess formation in the body. When these abscesses occur in the spinal canal a loss of power in the hind limbs occur (similar to swayback, but in older lambs) is seen. Louping ill (often called 'Tremble' in the west – a good description of one of the clinical signs we see in affected lambs) is a virus condition of the brain which causes nervous signs and diagnosis is by post-mortem examination. If you have sheep showing nervous signs talk to your vet. Treatment to control the ticks is the usual course to follow if you have a problem. (Refer to Peter Bates' paper).

Abortions

Abortions in a sheep flock should be investigated if the rate of abortions goes above about 3% of the flock. (Background abortions may occur in up to 3% of pregnant ewes without there being any specific infectious cause involved.) Toxoplasmosis and enzootic abortion of ewes (EAE) are the two most common causes of abortion outbreaks in sheep. Both are controllable by vaccination but a specific diagnosis is necessary. If a high rate of abortions is occurring in your flock consult to your veterinarian about getting samples to the laboratory for investigation. **Make sure you bring fresh clean afterbirths as well as the foetus.** Blood samples from the ewes can also be submitted to help making a diagnosis.

Profiting from performance recording in a hill flock

Samuel Wharry
ARAgs, *Harphall, Carnlough, Co.Antrim. BT44 0HG. Northern Ireland.*

We farm about 500 acres along with 160 acres of common grazing at Harphall in the southern Glens of Antrim. The farm runs from about 50ft above sea level to just over 1000ft, so as you can guess it's pretty steep. We have about 50 acres of field ground, 150 acres of inbye grazing, and about 300 acres of rough grazing and heather moorland. The sheep stock currently consists of around 560 ewes and 200 dry hoggets, with 150 retained for replacements, and 50 sold on contract to a local young farmer, James Davison. This year we have entered into a share farming partnership with James, which will result in total ewe numbers increase to 850 over the next 3 years, with the farm at Harphall providing hill grazed, maternal type replacements for the entire flock. The present system consists of 160 ewes, which are part of AFBI's hill sheep crossbreeding trial work, 120 Blackface ewes are bred pure to provide replacements, both for themselves and for the crossing flock of 120 Blackface ewes which are crossed to Lleyn tups. A small flock of crossbred ewes are kept on the lower ground and currently crossed to a Belclare sire to produce replacements for James' farm, where they will be crossed to a terminal sire, at the moment the Sufftex. Both these flocks will be increased in the coming years.

My aim since I started farming has always been to enjoy as good a lifestyle and farming career as I can. To do this I have four basic objectives, firstly, to maximise subsidy payments to my farm, as a friend in Scotland always says, "I don't care where money comes from, so long as it comes to my farm." Secondly to increase productivity, whilst thirdly reducing labour, and finally and very importantly to produce a product which I can be proud of, whether it is a finished lamb for the factory or a breeding ewe moving on to another farm. As I've got older I've added another and perhaps more important objective as I think that it is vital that I improve my sheep's ability to look after themselves at least as quickly as my ability to look after them drops.

So what are the biggest problems with our sheep flocks and what can we do to help solve them. Low fertility especially amongst younger ewes, and poor mothering ability combined with small slow growing lambs are probably the most common complaints directed at hill sheep, and lame ewes are the bane of every sheep farmer's life, whether they are hill or lowland. In our own situation we decided that the best way to improve our flock was to record and cull problem sheep and to only breed from ewes which

had proven that they could perform on our farm and under our management. Obviously, the purebred Blackface ewes are the cornerstone of the entire flock, as all the breeding stock is descended from them, so we consider it vital to work on improving the mothering ability and production efficiency of these ewes as this will have long term benefits for the entire flock. The further up the breeding chain we go the more ruthless we become in removing sheep which give us problems. We will be scanning in the next few days, and any empty ewes will be culled, similarly, any ewes not rearing a lamb at the end of lambing will be culled, and any ewes which give problems, or are poor mothers will be recorded and culled when their lambs are reared. When we first started with this policy, about 12 years ago, our replacement rate rose alarmingly, luckily it was at a time when breeding stock was relatively cheap, and since we were breeding our own replacements, I took the view that I might as well keep a ewe which gave me no hassle and reared a good lamb, rather than some "bimbo" which looked pretty but looked after herself rather than her lambs. As time has gone on we have found that we have less hassle every year, and less sheep to cull, despite becoming less tolerant of problem cases, and we are now back to selling most of our ewes as good genuine cast ewes, which have gone through their lives without giving any trouble, and go on to rear two or three more crops of lambs on better farms.

Signet rcording scheme

Our pure Blackface flock has been recorded through the AHDB Signet Sheepbreeder Service since 1997, and since 2006 we have been using an across breed analysis, which allows us to compare our ewes individual performance with other flocks in the scheme across the whole of the UK. This has been a great boost to identifying the best genetics across the whole Blackface breed, and has helped to speed progress for all recording flocks.

The Signet scheme produces seven Estimated Breeding Values (EBVs) based not only on the animal's own performance, but also on the performance of all it's recorded relatives within the scheme. (Table 1) These seven traits are used to produce an overall performance index, which is a useful quick guide to an animal's breeding potential.

Table 1. Outline of Estimated Breeding Values (EBVs)

EBV	Brief Explanation
8 Week Weight	Potential growth from birth to 8 weeks of age, largely dependent on mother's milking ability.
Mature size	High figures will increase mature size
Litter size	Potential to increase prolificacy of female replacements
Maternal ability	Higher figures indicate better maternal traits of daughters (i.e. better milkers and mothers)
Scan weight	Potential growth to scanning at 20 weeks old. Higher figures will result in heavier carcasses at the same fat class.
Muscle depth	Measured by ultrasound scanning. Higher figures indicate deeper loin muscle.
Fat depth	Lower or negative figures indicate lower fat levels and leaner animals

When we originally started using Signet recording, it was mainly to maintain the size and conformation of our Blackface flock. We probably didn't pay enough attention to maternal traits, but as the first 4 or 5 years are really only spent building up information on your sheep, it probably wasn't that important. As information on our ewes built up, and our accuracy levels improved as the figures became more robust, we started to discover that the ewes which were giving problems at lambing time, and rearing our poorer lambs, almost invariably had lower EBVs for maternal and 8-week weights.

So what sort of figures should we be looking for when we are selecting replacement stock tups. In our own case we now prefer to use individual EBVs rather than just the index. We place particular emphasis on the Maternal EBV and the 8-week and Scan weight EBVs looking for sheep which are at least in the top 10% of the breed for these traits, to try and breed ewes who will be good mothers and produce high growth rate lambs. We look for Muscle depth and Litter size EBVs which are above average, as muscle is important, both for conformation in wether lambs, and as a store of energy to carry ewes through the winter period. Whilst we don't want litter size to get too high, (the last thing I want is triplets) lower figures can show a tendency in that bloodline for too many barren ewes especially in my experience in Blackface ewes. As we feel that our ewes are big enough we try not to get our mature size any higher, although this tends to happen naturally with higher scan weight EBVs. As long as growth traits are good we are quite happy with slightly positive fat depths as again we want ewes which can retain condition over winter, and considering the price of concentrates, the last thing we want is big, lean wether lambs, which we have to pump with meal to try and finish.

Benefits of recording

So is it all worth it? Many sheep farmers claim that they just haven't got time for all the hassle of tagging lambs and recording parentage at lambing time, but I would contend that I would much prefer to spend my time doing this rather than getting lambs a suck, or trying to persuade some stupid brute with no maternal desire to accept her own lamb, which she is determined she doesn't want. We all have ewes which get on with the job of producing two good lambs, and making a decent job of rearing them year after year, without attracting any attention to themselves, and we all have those which give trouble, have little colostrum and don't want to know about their own lambs. I don't think there is any doubt as to which one we should be keeping our replacements from, but if you aren't recording, can you really be sure that flashy looking ewe lamb isn't a big single that you had to haul out of a ewe in the early hours of the morning or that it's not from a long line of flashy looking, but lousy mothers. Recording for maternal traits is certainly a long term strategy, but it is amazing just how quickly progress can be made, just by identifying and culling problem ewes from the flock, and this progress is cumulative, so as long as you are using recorded tups, selected for the traits that are important to you, to breed replacements, then each generation should be superior to the last. This last point is vital, there is absolutely no point in recording and selecting superior sheep in your own flock if you then go out and source your tups from unknown sources where you have no idea of the management or treatment of the flock you are buying from. In our own case we now buy all our stock tups privately off farm, mostly from recording flocks in Scotland, who are members of the Maternal Sheep Group. This is a group of commercial sheep farmers across the UK, who concentrate on breeding sheep which are "fit for purpose" rather than looking pretty and winning shows. I prefer to buy older tups 3 or 4 shear, partly because they have proved that they can survive for that long, and partly because the fact that they have lambs on the ground vastly improves the accuracy of their EBVs and helps to improve the linkages between our own flock and others in the Signet scheme, and so helps the accuracy of our own figures.

In our own flock we have certainly seen the benefits. We no longer possess an adopter crate, and in the past five years we have only had a couple of ewes which rejected their own lambs.(needless to say they are no longer with us). Last year (2014) we turned out a batch of 94 Blackface ewes with pure and crossbred twins, 188 lambs, and at 8 weeks old we weighed 185 of them. The ewes were checked once a day for tetany, but otherwise they were left to get on with rearing their lambs, which they did. I believe that this is the most important criteria that we should be using to judge our sheep. I listen to friends who are Blackface breeders saying that we need to breed wild sheep which have their

heads up in the air, showing themselves off, but whilst they may look very well in the sale ring in autumn, but, in my opinion, they are simply searching for an escape route. I have yet to see a ewe which looks well running off down the field leaving you standing with a lamb, and likewise a very plain ewe can look very impressive standing stamping her foot over her lamb, or better still coming into the pens with a good set of twins behind her in August.

From 2007 until 2010 QMS (Quality Meat Scotland) in conjunction with the Meat and Livestock Commission and Signet undertook a four year study on six hill and upland farms with various breeds across Scotland to compare the progeny of daughters of High Index tups with those of Low index tups and as a control "Farm Choice" tups which were selected by the participating farmers by eye only. Across the six farms they recorded nearly four thousand lambings, and they found that the value of the High Index tups averaged approximately £11/ ewe more than the Low Index, and £5/ ewe more than the Farm Choice tup. Whilst some of the Farm Choice tups performed reasonably well they were extremely variable, is that something which you are prepared to risk? I know that on a farm like mine with 560 ewes there is a potential extra return of £6160/ year. I think it is too big a chance to take.

Hillsborough Management Recording Scheme (HMRS)

Since it became available in 2005 we have been using the Hillsborough Management Recording Scheme for our crossing Blackface ewes. This is a free service offered by the Agri-food and Biosciences Institute in Northern Ireland. Our crossing ewes are primarily used to produce our own replacements for our Lleyn X Blackface flock and would be mainly lower index, or ewes which don't conform as well to breed type. We find it a fairly simple scheme which requires only a minimum of time and effort from the farmer. At birth all lambs are tagged and their parentage recorded, along with a simple tick box score for lambing difficulty and milking and mothering ability. The lambing books are returned to AFBI at Hillsborough, and that is it for recording until weaning time, unless a ewe has a particular problem such as mastitis or footrot which can be noted in the recording book. At weaning the lambs are weighed and from this information a list of ewe lambs, ranked in order of their suitability as replacements is produced. The final choice is still down to the farmer. If I don't like it I don't have to keep it, but knowing that a lambs dam had an awful lambing, or was a lousy mother can make it look a lot less attractive to keep as a ewe. This service is now available electronically, where the information can be entered into your Psion handheld computer and the various calculations performed by your recording programme, allowing you to have instant access to all this information. No doubt we will eventually get to this stage, but for computer illiterates like myself it is comforting to have something written on a book, as at least I'm sure I can still find it.

Future developments

So what does the future hold? There are a host of new developments becoming available to us as sheep farmers. Faecal egg count EBVs are already available to allow breeders to select sheep for worm resistance, and Signet are conducting research into producing EBVs for ewe longevity and what information we need to record to measure lamb survivability. SRUC (Scottish Rural University College) are conducting interesting research into TSTs (Targeted Strategic Treatments) on Blackface and Lleyn lambs at Kirkton Farm in Perthshire where electronic tags and computer programmes are used to decide whether lambs are reaching their expected growth rates, and only those which are not are dosed. In this way they have identified ewes which are capable of high levels of production without the need for expensive treatments. Sheep Ireland, with the Ovigen research project, is now at the forefront of using DNA technology to drive forward sheep recording. Genomic recording like this has the potential to identify high performing sheep which are resistant to various diseases from a simple blood test, but in order to benefit from all this we still need a large population of sheep which are well recorded so that we can have a robust sample to test this technology on. We need more sheep farmers, and especially tup breeders to get involved in performance recording, and if we are to make real progress we need the various bodies offering recording schemes to co-operate and share information so that we can develop EBVs which go across breeds and across borders.

In the meantime what can we as hill sheep farmers do to make our flocks more productive and our lives easier. Well in our own flock we intend to continue to use both the Signet scheme on our purebred ewes and the HMRS scheme on our crossing ewes to maintain and continue our progress in increasing productivity whilst reducing labour. We will be concentrating more on health traits to increase efficiency, and I think that we have a long way to go yet in improving our management of both growing and utilising grass to provide two decent incomes for both James and myself from the farm. Of course it isn't necessary for every farmer to get involved in recording themselves. They can benefit simply from buying recorded tups which are strong in the traits that they want to improve in their own flocks. There are many ways for hill farmers to benefit from recording, whether it is something as simple as ear notching ewe lambs out of good mothers to keep as replacements, or tagging problem cases for future culling, through to getting involved in performance recording schemes, the ethos of breeding for easier care is fairly simple. It is to record and cull problems for an easier future.

Reducing the Losses Caused by External Parasites

Peter Bates
Veterinary Medical Entomology Consultancy (VMEC).
Email: Pgj.bates@ntlworld.com

External parasites (Ectoparasites) inhabit the skin and fleece of sheep, seriously affecting their welfare and production. A number of ectoparasites infest sheep in Ireland, and can be broadly divided into two main groups: a) those that spend their entire lifecycle on the sheep (Permanent Ectoparasites), prevalent during the winter months (e.g. scab mites (*Psoroptes ovis*) and chewing lice (*Bovicola ovis*)) and b) those that complete their lifecycle off the sheep (Semi-Permanent Ectoparasites), prevalent in during late spring, summer and early autumn (e.g blowfly larvae (*Lucilia sericata*) and ticks (*Ixodes ricinus*)). For hill farmers the three main ectoparasites are scab mites, chewing lice and the ticks. Hill sheep can also be affected by blowfly strike, but this is more prevalent when the sheep are taken off the hill and graze in-bye.

Chemical control of sheep ectoparasites

It has been estimated that sheep scab costs Britain as a whole £8 million per year, in Scotland £5.1 million and Wales between £2.3 and £5.6 million. A large proportion of these costs are due to the cure of existing infestation and preventing the introduction of disease, rather than the effects of scab itself. If sheep scab was controlled these costs would be dramatically reduced. If scab was eradicated they would stop completely!

For most sheep farmers the current control of ectoparasites relies on the use of chemical ectoparasiticides. The control of semi-permanent ectoparasites is generally pro-active, routinely timed to the parasites behaviour and farming practices: e.g. tick control generally takes place during late spring/early summer when ticks are abundant and young lambs are turned out onto infested grazing and blowfly control generally takes place June/July when blowflies are abundant and the risk of strike is high. However, the control of permanent ectoparasites such as scab and lice is generally on a reactive basis taking place once the parasites have taken hold in the flock. This non-strategic control strategy can result in the overuse or misuse of the few existing scab/lice treatments.

The use of diazinon dip products via non-validated/non-authorised methods of application (e.g. showers) has the potential to generate OP resistance in mite populations. The overuse of Macrocyclic Lactone (ML – doramectin, ivermectin, moxidectin) injections for scab control has the potential to generate resistance in non-target parasites,

particularly gut worms and scab mites themselves. There are also the negative economic effects of the excessive meat withdrawal periods (MWPs) on the marketing of finished lambs.

The development of diazinon or ML resistance in the scab mite and/or the widespread development of ML resistance in gut worms would be a disaster for the Irish sheep industry. The control of scab, lice and ticks must be more strategic in order to maintain the efficacy of the current ectoparasiticides and protect the Irish sheep industry. This control strategy should include a number critical control points.

Eradicating existing scab and lice

Initially if a flock has an existing chronic scab or lice infestation it would be necessary to eradicate this from the flock. If the flock does not share grazing with any other flock at any time of the year this is possible.

Firstly, the parasite needs to be professionally identified by a veterinary surgeon and the correct treatment advised. It is fundamentally important that an ectoparasiticide controls the parasite identified. MLs are not effective against lice. Consequently, if an ML injection is administered to control a louse infestation it would not only fail but could select for resistance in the gut worm population. Synthetic pyrethroid (SP) based pour-ons are not effective against scab mites and their misuse may select for SP resistance in an actual louse infestation and possibly select for SP resistance in blowfly larvae and/or ticks. They have been incriminated in developing SP resistance in scab mites in Britain. These misuses of ectoparasiticides would not only be a waste of time, but would be costly, as a correct ectoparasiticide would then have to be purchased and administered and the flock would also have to suffer unnecessary (and relatively long in the case of ML injections) meat withdrawal periods. Veterinary cost would be negligible compared to the effects and costs of misdiagnosis.

All sheep on/off the main holding should be treated at a convenient/cost-effective time. Winter is ideal, with the lowest number of sheep on the holding (less ectoparasiticide used), MWPs are more tolerable and sheep in full fleece are ideal for plunge dipping. Treat with a product (and application method) advised for the control of the identified parasite and always follow the manufacturer's instructions. For plunge dipping calibrate the dipbath, make the wash up correctly, mix, dip for one minute, replenish according to the manufacturer's instructions, wear personal protective equipment (PPE) and dispose of the used wash in an authorised way that protects the environment. For ML Injections, weigh all sheep to be treated, calculate the dose for heaviest sheep, inject by correct method (s/c or i/m), do not mix treated and untreated sheep and move treated sheep to new housing/grazing if product does not offer protection.

Keeping scab and lice out.

Once scab or lice are eradicated from the flock, plans must be place to keep it out. These scab/lice prevention plans must be included in a Flock Health Plan (a flock health plan does not need to be complicated see *Moredun Foundation News Sheet. Vol 6, No3, August 2014*).

All scab starts as a small, sub-clinical lesion. Sheep with sub-clinical lesions look perfectly normal and would not be suspected of being infested, as can sheep with sub-clinical louse infestations.

Studies have shown that 70% of scab outbreaks are the result of animal movement. These movements can be "unintentional" (passive) through infested stray animals mixing with an uninfested flock (34%) or "intentional" – buying/selling of stock already sub-clinically infested at the point of sale/ purchase (36%). Sheep can also be infested while in transit, with residual mites/lice in lorries or trailers that have previously transported clinically infested sheep.

Passive introductions of scab and lice can be prevented in flocks that do not share grazing. Fences should be well maintained, effective in keeping sheep in and out. If possible double fencing should be employed (1m apart). However, this is not always possible and can be costly. Electric netting is mobile and can provide an effective temporary solution. Ensure all gates are securely locked. Many cases of scab have originated from "well minded" people introducing infested stray sheep to an un-infested flock!

Prudent purchasing

In a closed flock with well-maintained fences you should never have a problem with scab or lice – they can only be introduced through an infested sheep! The overall health status of all purchased sheep should be considered, other unwanted diseases such as EAE, MV, CLA, OPA, CODD, Orf, roundworms, fluke etc can also be introduced through incoming stock.Whenever possible stock should be seen before purchase – reject the whole batch if one animal presents with signs of itching/scratching. Enquire about their disease history and ask to see the medicines records – when were they last treated and with what! Tups must be purchased early and quarantined before introducing to the ewe flock. Use dealers with caution!

Scab or lice can be introduced through a single sub-clinically infested sheep or a group of infested sheep and the clinical signs of disease may not appear for weeks, months or even years after their introduction. Initially these sub-clinical lesions progress slowly allowing mite numbers to increase until sufficient to pass onto other sheep (or be deposited in the environment). Contact sheep in turn may develop scab, initially sub-clinical, progressing to clinical disease presenting with clinical signs. In turn these sheep will pass mites onto other sheep and so on. In addition to active

transfer via sheep to sheep contact, mites may also be deposited in the environment allowing for passive transfer to sheep that come in contact. Scab mites and lice can both survive off the sheep for 17 days and still be infestive to other sheep.

Eventually the number of sheep presenting with the clinical signs of scab warrants veterinary intervention. At this point between 5% and 60% sheep can be infested, with lesion areas ranging from 1.0cm^2 to total body cover (> 4000 cm^2). This can be a single lesion or multiple lesions that eventually coalesce forming one large lesion. The majority of lesions occur in an area from the neck, over the withers to the mid back, extending over the forelegs to the axillae (armpits). By this time it may be too late severe economic damage may already been done and there is a significant welfare issue.

Scab can be a costly problem, through:-

Veterinary Costs	Diagnosis
Ewe, ram, lamb mortality	Secondary bacterial infections, hypothermia, loss of body condition.
Fallen Stock	Cost of disposal
Replacement Stock	To replace fallen stock
Reduced tupping rate	Belly/groin lesions irritate tup, back lesions irritate ewe.
Infertility	Scrotal infestations.
Low birth weights	Ewe pre-occupied with irritation – reduced feeding.
Reduced growth rate	As above plus reduced milk production.
Cost of treatment	Medicines, labour, dipping contractor, training, dip disposal, frequency of treatment.
Lost market opportunities	Long meat withdrawal periods, lambs in poor condition.
Extra Feed	For fattening lambs or ewes in poor condition.
Leather	Reduced quality/condemned
Wool	Loss of wool clip
Lost Time	Other jobs postponed.
Buildings and Fences	Damage through excessive rubbing.
Legal Costs	Sheep Scab Order (1997).

These losses have been estimated (for a hypothetical lowland flock) to be:

- 25% increase in lamb mortality.
- Lamb finishing time increased by two weeks.
- Additional lamb creep feed for two weeks.
- Cost of treatment (single injection of doramectin).
- Value of wool clip reduced by 50%.

This equates to an overall potential profit of + €6.825 (+ £5.25/ewe) reduced by - €24.492 (- £18.84) to give an overall loss of - €17.641 (- £13.57/ewe).

Quarantine introduced stock

36% of scab is introduced to a flock through intentional animal movements, stock introduced or returning to the main holding. These may be new stock purchases (including tups), stock on loan (mainly tups), stock returned from market, stock moved to another grazing owned by the same keeper (away from the main holding), stock moved to another grazing owned by another keeper (winter grazing, "on tack", "agisted"). These sheep may have come in contact with scab mites or lice. Quarantine all stock entering/re-entering the main flock – assume all have scab. Quarantine facilities must be fit for the job, stock entering/re-entering the main flock can range from a few tups on loan to several hundred newly purchased store lambs or ewe replacements. Apply Integrated Parasite Control, use the quarantine guidelines described on the Strategic Control of Sheep Parasites (SCOPS) website ((www.scops.org.uk), covering other parasites that may be introduced to the flock. The SCOPS Quarantine Guidelines consist of 3 Steps.

Step 1.	**Treat** – using monopantel (Zolvix™) or derquantel + abamectin (Startect™) based anthelmintic for worm control. Plus. Moxidectin 1% Injection (Cydectin Injection™) for scab control (this will also control ***Psoroptes*** mites in the ear).
Step 2.	**Quarantine** – on hard standing for 24/48 hrs to allow eggs from unexposed worms to be voided before the anthelmintic takes effect.
Step 3.	**Turnout** – to "dirty pasture" (cydectin protects against scab in environment for 28 days) – no direct contact with other sheep.

Disinfestation of pens and transportation

Scab mites and lice can live off the sheep for 17 days and remain infestive to sheep and can be deposited in/on the fabric of stock housing (particularly where stock is overwintered), market pens, transport lorries/trailers, fencing (particularly in wool and scab) and anywhere infested sheep rub or scratch. The risk of residual mites or lice can be reduced by leaving transporters, trailers or pens that have come in contact with infested sheep empty for a minimum of 21 days. If this is not possible steam cleaning can be effective as can the use of disinfectants (2.5% sodium hypochlorite – gives 100% kill after 7 hrs). The use of dilute sheep dip is not recommended due to the human/environmental safety issues.

Contractors and visitors

Visitors to the holding (scanners, shearers, veterinary surgeons) may be carrying residual mites or lice picked-up from previous farm visits. Enquire if they have effective decontamination procedures on leaving a farm. If this is not sufficient it may be necessary to supply your own protective clothing and shearing hand pieces, combes, cutters and moccasins. Washing combs and cutters in boiling water or alcohol will also be effective in killing scab mites and lice.

Common grazing

The above strategies generally apply to closed flocks, not mixing with any other flock at any other time of the year. Sheep scab and lice can be embedded on a hill grazing, particularly where there are

more than on flock sharing the grazing and is generally sub-clinical. This may be due to the endemic sheep breed (scab mites have difficulty infesting hill sheep with open fleeces and there is some evidence that they are naturally resistant), many ewes may have had scab before and subsequent infestations will be subclinical, mite virulence – some strains of scab mite have very low virulence, taking a long time to establish disease/present with clinical signs. Sheep scab is a form of allergic dermatitis, the sheep allergic to the mite faeces and the severity of the scab related to the immunity of the individual sheep to the faeces. Tick borne diseases such as Tick Borne Fever (TBF) suppress the immune system and thus may render sheep scab sub-clinical.

Control on common grazings involves application of the closed flock principles for incoming sheep and sheep in-bye, as described above. On the common grazing itself there must be the cooperation of all commoners to eradicate scab and lice, particularly regarding frequent common clearances (keeping sheep off for 21 days). During this time all feral sheep must be treated or killed and all flocks should be treated with a product that offers long term protection (against residual mites on brambles etc) such as plunge dipping in diazinon or injections with moxidectin, before turn-out back onto the common grazing. However, history shows that scab eradication on a common grazing can be difficult – all it takes is – "one bad apple!"

Tick control

Hill grazings can also be infested with ticks, the commonest being *Ixodes ricinus* – the sheep tick). It has been estimated that over 300,000 hill lambs die each year due to ticks and tick-borne diseases. Added to that the large number of lambs stunted and crippled by lamb pyaemia and louping ill. Ticks can also be vectors of human diseases such as lyme disease and tick-borne encephalitis (TBE).

Unlike scab mites and lice, ticks (and tick borne diseases) are endemic to the grazing and they are difficult if not impossible to eradicate. This is primarily due to the fact that ticks do not feed exclusively on sheep, using a wide range of mammalian hosts for a blood meal in order to complete their lifecycle. Tick suppression is possible, although studies have shown that the use of SP pour-ons over 3 years specifically for tick control, did not reduce the incidence of tick borne disease (TBF/Lamb Pyaemia) significantly.

Chemical control involves plunge dipping in diazinon and the use of synthetic pyrethroid pour-ons. These should be used alternatively to prevent the development of resistance to either ectoparasiticide. Ticks require dense moisture-retentive vegetation in order to survive when they are off the sheep. This can be rough grazing, moorland, heathland, woodland and longer, ungrazed grass (particularly around fences). Ticks can therefore be controlled through the burning/cutting of bracken and other dense vegetation that harbours the small mammals and birds fed upon by the larval ticks.

Contact Details:

Head Office: Teagasc, Oak Park, Carlow, Ireland
Tel: +353 59 917 0200
Fax: +353 59 918 2097
Email: info@teagasc.ie

www.teagasc.ie

Modern Printers: 056 7721739

MSD

teagasc
Agriculture and Food Development Authority

Mullinahone Co-op