Efficient sheep production in a subsidy free environment – Research from Athenry

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Ireland has 4.26 million sheep, which is the fifth largest flock in the EU 25, accounting for approximately 5% of the total ewe number. In 2005 the output from sheep production was equivalent to €192million which was 3.9% of the Gross Agricultural Output. Since the implementation of the Mid Term Review (MTR) of the Common Agricultural Policy (CAP) sheep production is in the process of transition from an environment in which decisions were often subsidy driven to a market orientated, subsidy free system. With the decoupling of subsidy from farm production and the proposed reduction of tariffs in World trade, it is predicted that the Irish ewe flock will decline by up to 24%. Since the implementation of the MTR of the CAP on January 1 2005 ewe numbers have declined by 7.5%. Sixty eight per cent of flocks have less than 100 ewes with only 11% of flocks having greater than 200 ewes.

Prior to December 31 2004, in the subsidy driven systems of sheep production operated in Ireland, the subsidy received equated to €1.43/kg carcass produced. To achieve a viable income from sheep production in the future producers will have to increase flock size, increase output per labour unit, improve production efficiency whilst at the same time obtaining a higher return from the market place to offset the loss of the equivalent of the €1.43/kg carcass in subsidy forgone. The aim of this paper is to highlight the potential savings, which can be made in the cost of sheep production based primarily on research studies undertaken at Teagasc Athenry.

What is the current output of lamb, and what is achievable?

Weight of lamb carcass output per ewe put to the ram but ultimately per hectare are the major factors effecting margins from sheep production. Recent studies undertaken at Athenry and Knockbeg have reported annual

lamb carcass output of up to 500 kg/ha (Table 1). These high carcass outputs were achieved from a combination of high stocking rate and high weaning rate. Currently a large proportion of flock owners are participants in the Rural Environment Protection Scheme (REPS) which limits potential stocking rate. Recent studies at this centre involving outdoor year round grazing compatible with REPS, have shown that an output of 344 kg lamb carcass per hectare is achieveable (Table 1). Data from the National Farm Survey (Table 1) indicates that the national average output of lamb carcass on lowland farms is only about 197 kg/ha, which is due to a low stocking rate combined with low number of lambs reared per ewe put to the ram. The output of lamb carcass achieved in research flocks in conventional and REPS compatible grass based systems were 150% and 80% greater than the national average.

Table 1. Achieved lamb output at Athenry and the national average output

	Athenry			National Average
	Conventional	Conventional	REPS	
Ewes/ha	16.5	14	10	8.3
Lambs reared/ewe	1.70	1.86	1.78	1.25
Lamb carcass output				
kg/ewe	31.3	35.3	34.4	23.8
kg/ha	494	494	344	197
	(Nolan and McNamara, 2002)	(Flanagan, 2000)	(Flanagan, 2000)	(Kinsella, 2005)

Improving Efficiency

Improvements in efficiency on farms is possible by exploiting changes in genetics, nutrition and management of the ewe flock.

Improvements in genetics

Whilst improvements in efficiency of sheep production due to breeding are slow, the changes are cumulative and permanent. Improvements in genetics are achievable through the ewe and the sire.

Ewe genotype

Weight of lamb sold per ewe joined to the ram is the major factor affecting profitability at farm level. Changing genetics is the cheapest and often the only method available to improve lamb output per ewe. A major study involving 2000 ewes was undertaken at Athenry to evaluate the impact of ewe genotype on lamb output. Eight sire breeds were mated to Scottish Blackface ewes and the female progeny were evaluated to determine the effect of ewe genotype on fertility, litter size and weaning rate (lambs reared per ewe joined to the ram). The results are presented in Table 2. Fertility is the proportion of sheep let to the ram that produce lambs. The Belclare X, Border Leicester X, and Scottish Blackface had the highest fertility whilst the Cheviot X and Galway X had the lowest. The Belclare X produced the highest litter size being 0.41 greater than Scottish Blackface and 0.18 greater than the Bluefaced Leicester X (Mule). The number of lambs reared per ewe put to the ram (weaning rate) provides an overall index of reproductive performance. Choice of ewe genotype altered weaning rate by 0.36 lambs/ewe and, based on 2005 lamb price, the value of lamb sales by €22/ewe put to the ram. The Belclare X produced the highest weaning rate, being 0.16 greater than the mule (€10/ewe), and 0.34 (€22/ewe) greater than the Suffolk X. Currently the national flock consists of 45% Suffolk and Suffolk crosses.

The data presented in Table 2 clearly illustrate that total weaning rate can be increased dramatically by changing the ewe genotype. Use of Belclare in the first cross with the Scottish Blackface resulted in an extra 36 and 21 lambs being weaned per 100 ewes put to the ram relative to the purebred Scottish Blackface and Suffolk X, respectively. Furthermore increasing the proportion of Belclare genes in the ewe will increase the weaning rate further. Recent data from Athenry show that a weaning rate of 1.95 lambs per ewe put to the ram is achievable when using purebred Belclare ewes. As the litter size increases the proportion of ewes in the flock producing triplets increases. Some producers wish to avoid triplets, as they believe that they are difficult to finish. Recent data from this Research Centre have shown that lambs reared

as triplets, using appropriate management, only require an additional 14 days to achieve similar carcass weights as lambs reared as twins.

Table 2. Effect of ewe genotype on reproductive performance

Ewe genotype	Fertility	Litter size	Weaning rate
Belclare x S. Blackface	0.94	1.89	1.54
Blue Leicester x S. Blackface	0.91	1.71	1.38
Border Leicester x S. Blackface	0.94	1.60	1.36
Suffolk x S. Blackface	0.91	1.65	1.33
Texel x S. Blackface	0.93	1.58	1.33
Galway x S. Blackface	0.83	1.63	1.20
S. Blackface	0.94	1.48	1.18
Cheviot x S. Blackface	0.86	1.51	1.11

(Hanrahan, 1994a)

Other more recent studies (Table 3) undertaken at this Research Centre have shown that Belclare x Cheviot ewes have increased the number of lambs weaned by 15 and 20 per 100 ewes put to the ram relative to Blue Leicester x Cheviot and Suffolk x Cheviot ewes respectively. The Technology Evaluation and Transfer (TET) project which was initiated in 2001 by Teagasc on 40 sheep units throughout Ireland for a three year period clearly illustrates that flocks which comprised predominantly (but not solely) Belclare X ewes had higher weaning rates of 0.08 and 0.24 relative to flocks which were either Mules or Suffolk X. In recent years there has been interest in the use of the Vendeen breed. A major study was undertaken on a large commercial farm (1140 ewes) by Teagasc to evaluate the effects of Vendeen X and Belclare X ewes on prolificacy. The ewes had been bred on the farm as flock replacements and performance was recorded over a three year period. The data from the study showed that the Belclare X ewes produced larger litters and number of lambs born alive per litter. For the Belclare X and Vendeen X ewes litter size was 2.15 and 1.95 lambs/ewe and number of lambs born alive were 2.00 and 1.81 lambs/ewe respectively. Therefore the major effects of ewe genotype on weaning rate observed in many studies at Athenry have been confirmed at farm level.

Table 3. Effect of ewe genotype on reproductive performance

Ewe genotype	Litter size	Weaning rate
Belclare x Cheviot	1.87	1.62
Blue Leicester x Cheviot	1.78	1.47
Suffolk x Cheviot	1.72	1.42

(Hanrahan, 1997)

Terminal sire breed

Using the payment schemes currently in use by the majority of export meat plants growth rate is the most important characteristic when choosing a terminal sire breed. Increased growth rate enables lamb to be finished earlier, reducing feed costs whilst at the same time avoiding lower prices as the season progresses.

Most processors offer bonuses of only 6c/kg for U grades. Assuming a 20 kg carcass, the bonus of 6c/kg is worth €1.20, which is equivalent to either 0.36 kg carcass or the additional weight gain achieved by keeping the lambs approximately 4 days longer on your holding prior to slaughter. However selecting sire breeds for improved conformation is most unlikely to increase the proportion of "U's" by as much as 20%, an increase of this magnitude is equivalent to 1.2c/kg carcass of all lambs marketed. Furthermore it should be noted that breeds with improved conformation characteristics tend to have lower growth rate therefore being older at the point of marketing. Consequently increased feed costs will accrue whilst at the same time lamb price is likely to decline as the season progresses. Therefore whilst conformation is a frequently discussed topic in the industry, the reward is relatively small.

A major study at Athenry has evaluated the effect of nine sire breeds on progeny performance and the data are presented in Table 4. Choice of sire breed altered weaning weight by up to 2.5 kg and days to slaughter by up to 20 days. The progeny of Suffolk rams were heaviest at weaning and earliest to reach slaughter. Relative to the Suffolk, the Charollais and Texel progeny

required an additional 5 and 9 days to reach slaughter weight respectively. Progeny from the other sire breeds, required between 12 and 20 days relative to progeny from the Suffolk to reach slaughter. The Beltex produced progeny with the best conformation followed closely by Ile de France, Suffolk, Charollais, Texel and Vendeen. Beltex had the highest kill out proportion followed closely by Ile de France, Charollais and Texel.

Due to interest within the industry in the Vendeen as a terminal sire breed a further evaluation of the breed, in direct comparison with the Belclare, was undertaken on a large commercial farm (1140 ewes) by Teagasc. At weaning lambs sired by Vendeen and Belclare rams weighed 31.9 and 31.0 kg respectively similar to the differences observed in the large breed study undertaken at Athenry, which concluded that lambs sired by Vendeen and Belclare rams produce carcasses of similar characteristics at the same age.

Recently the Suffolk, Texel and Beltex terminal sire breeds have been evaluated in Northern Ireland (Table 5). Similar to previous work at Athenry, the data from Northern Ireland confirm that relative to the Suffolk, progeny from Texel sires take slightly longer to finish whilst progeny from the Beltex require an additional 22 days to achieve similar finish and carcass weight. However Beltex progeny had improved conformation and increased kill out proportion in agreement with Teagasc data.

Table 4. Effect of terminal sire breed on progeny performance

Sire breed	Weaning wt. (kg)	Extra days to finish relative to the Suffolk	Kill-out (g/kg)	Carcass	
				Conformation [1]	Fat[2]
Suffolk	31.8	-	438	3.3	3.3
Charollais	31.0	5	449	3.3	3.2
Texel	30.6	9	446	3.3	3.2
Beltex	30.5	16	446	3.5	3.3
Ile de France	30.2	20	452	3.4	3.4
Rouge de l'Quest	30.2	12	438	3.2	3.2
Vendeen	30.0	14	445	3.3	3.2
Bleu du Maine	29.4	18	435	3.2	3.1
Belclare	29.3	15	442	3.1	3.3

[1] EUROP scale where E=5, U=4, R=3, O=2, P=1.
[2] 1 = leanest to 5 = fattest

(Hanrahan, 1999)

Table 5. Effect of terminal sire breed on carcass characteristics of lambs slaughtered at Fat class 3

	Sire Breed		
	Suffolk	Texel	Beltex
Weaning weight (kg)	37.5	36.6	34.7
Age at slaughter (days)	156	159	177
Kill out (g/kg)	434	456	459
Carcass characteristics			
Weight (kg)	19.2	19.5	19.4
Conformation[1]	3.0	3.3	3.5

[1] EUROP scale where E=5, U=4, R=3, O=2, P=1

(Carson et al, 2004)

Currently Suffolk and Suffolk X account for approximately 45% of the national ewe flock. Data from Athenry has concluded (Table 6) that when choosing a terminal sire breed for Suffolk X ewes, use of Texel and Charollais rams tends to produce heavier progeny at weaning and which finish earlier relative to progeny from Suffolk rams. This is probably due to reduced hybrid vigour when Suffolk rams are used on Suffolk X ewes.

Table 6. Effect of sire breed on the performance of progeny from Suffolk X ewes

	Sire breed	
	Suffolk	Texel
Weaning weight (kg)	33.8	34.2

(Hanrahan, 1994b)

The data from these studies clearly illustrate that when choosing a terminal sire, the only breeds which merit serious consideration are the Suffolk, Charollais and Texel. The other breeds produce progeny which take considerably longer to reach market and with little or no benefit in carcass characteristics. Furthermore, it is of interest to note, that the Belclare breed which was developed for its maternal characteristics resulted in carcasses of similar characteristics to the other breeds and take only 15 days longer to finish relative to the Suffolk, similar to the results of the five of the other eight breeds evaluated. In terms of cost of lamb production, terminal sire breed has a small impact on production efficiency altering the cost of production by about 7c/kg carcass produced, or €1.40/lamb.

Nutrition of the ewe and her progeny

Plane of nutrition can be altered at any stage during the annual cycle of the ewe or during the life-time of the progeny and will have an immediate effect on performance.

Nutrition in late pregnancy

The nutrient requirement of the ewe increases dramatically in late pregnancy due to the rapidly growing foetuses. The weight of the foetus increases by 85, 50 and 25% respectively during the last 8, 4 and 2 weeks of pregnancy. During the last six weeks of pregnancy the energy requirements of ewes carrying singles, twins and triplets increases by 40, 60 and 70% respectively. Currently in Ireland a large proportion of ewes are housed in late pregnancy and offered either grass silage or hay *ad-libitum* as the sole forage. Concentrate supplementation is required in late pregnancy to meet the rapidly increasing nutrient requirements whilst at the same time food intake capacity

is declining. The decline in food intake is due to the rapidly growing foetuses reducing available space within the abdominal cavity for the digestive system and its contents. The level of concentrate supplementation required depends on the forage feed value and the expected litter size.

Forage feed value

The major factors affecting the feed value of grass silage for sheep are digestibility and chop length. The effects of silage chop length on the performance of finishing lambs are presented in Table 7. Reducing the chop length dramatically increased silage intake resulting in improved animal performance as measured by daily liveweight gain and final carcass weight. These data clearly illustrate that chop length has a major effect and that the shorter the chop length the higher the silage intake.

Table 7. The effect of silage chop length on the performance of finishing lambs

	Harvester type			
	Single Chop	Double Chop	Precision	
			Long	Short
Liveweight gain (g/d)	40	53	85	151
Carcass weight (kg)	16.6	18.5	20.0	22.7

(Fitzgerald, 1996)

Digestibility (DMD) is the most important factor affecting silage feed value as it impacts on both the metabolisable energy concentration of the forage and also on its intake characteristics. Increasing silage digestibility increases feed value and reduces the level of concentrate supplementation required during late pregnancy. The impact of silage digestibility and chop length on concentrate requirement of twin bearing ewes during late pregnancy are illustrated in Table 8. Increasing levels of concentrate are required as silage digestibility declines and also as the chop length increases. It can be assumed that the intake characteristics of single chop and big bale silages are similar if ensiled under identical conditions. The data clearly illustrate that silage digestibility and chop length can impact on the quantity of concentrate

required during late pregnancy by up to 400%. Each 5 unit increase in silage digestibility offered during a standard winter housing period improves efficiency of lamb production by 16c/kg carcass through a combination of reduced concentrate requirement in late pregnancy and better nutrition in mid pregnancy which increases lamb birth weight and subsequent performance. (heavier weaning weight and earlier sale date).

Litter size

Litter size has a major influence on the level of concentrate required in late pregnancy. As litter size increases concentrate input must increase to meet additional nutrient requirements. For the 72 and 64 DMD silages in Table 8 concentrate feed levels can be reduced by 11 kg/ewe for single bearing ewes and should be increased by 7 kg/ewe for triplet bearing ewes during the last 6 weeks of pregnancy.

Protein requirements increase dramatically during the last 4 weeks of pregnancy. Consequently, during this period the crude protein level in the concentrate should be 18% for ewes offered moderate to high feed-value silages. However, for ewes offered low feed-value grass silage or hay the protein level of the concentrate should be increased to 20%.

Table 8. Effect of silage chop length and digestibility on concentrate requirements of twin bearing ewes in late pregnancy (kg/ewe)

Harvester	Silage DMD (%)		
Type	79	72	64
Precision	8	12	20
Single chop / big bale	12	20	30

Concentrate price

Concentrate price can vary dramatically. High quality concentrate can be produced cost effectively by mixing a blend of straights together with a proprietary sheep mineral and vitamin mixture and offered as a course ration. Examples of cost effective high quality concentrate mixtures are presented in Table 9. In late pregnancy good quality protein sources are desirable.

Soyabean is a high quality protein source and should be included in all supplements offered to sheep in late pregnancy. Replacing 5% of barley in these mixes with 5% soyabean meal alters the crude protein concentration by 2%. Concentrate price is very frequently discussed in the sheep industry. However, changing the price of concentrate by €30/tonne only alters efficiency of lamb production by 2c/kg lamb carcass produced.

Table 9. Simple concentrate mixes for sheep

(1)	40% barley, 35% beet pulp, 25% soyabean meal + 25 kg mineral/vitamins (Crude protein = 18%)
(2)	30% barley, 30% citrus pulp, 10% maize gluten, 10% distillers, 20% soyabean + 25 kg mineral/vitamins (Crude protein = 18%)

Grassland management

When all the costs of production and utilisation rate are considered, grazed grass is not a cheap feed to produce. Recent costings (Table 10) clearly demonstrate that whilst grass is the cheapest forage to produce, it is only 6 to 31% cheaper than ensiled forages. For example, maize when grown under the complete-cover plastic mulch system can now be produced and fed to farm animals at a similar cost to grazed grass. Furthermore, three cut silage only costs 16% more than grazed grass.

Table 10. The relative costs of forage production (all production costs including land charge)

Forage	Cost (€/t DM consumed)	Relative Cost
Grazed grass	104	100
3-cut silage	121	116
4-cut silage	136	131
Fermented whole crop	126	121
Maize - no plastic	134	129
- plastic	110	106

(after Keady et al, 2002)

In mid season fat lamb production, the forage component of the diet consists primarily of grazed grass. Additional feeds offered if required, are likely to be concentrate (€260-350/t dry matter) which is 300% or 690% more costly than grazed grass when all grass production costs or cash costs are included respectively. Consequently it is essential to increase daily performance from grazed grass to reduce production costs and enable lambs to finish earlier whilst avoiding price falls in the market due to late finishing. At Athenry many studies have been undertaken on achieving the optimum level of performance from mid season flocks whilst at pasture. During the grass growing season daily grass growth rates vary dramatically. For example, typical grass growth rates for March, April, May, June, July, September and October is 10, 40, 90, 50, 60, 30 and 20 kg DM/hectare per day respectively. At the same time the demand of the flock varies as the lamb grows pre weaning, whilst post weaning ewe requirements decline. At Athenry, sward height has been used to manage grassland. The impact of sward height on lamb performance pre weaning and post weaning are presented in Tables 11 and 12 respectively. Increasing sward height to 6 cm during the pre-weaning period increased animal performance. However increasing sward height had no further beneficial effects on animal performance. However lax grazing pre weaning resulted in swards which had stemmy, low-digestibility herbage later in the season and consequently poor lamb performance post weaning. Increasing sward height to 9 cm in the post weaning period increased animal performance. From the numerous studies undertaken at Athenry the target sward height to achieve optimum levels of performance are 5 cm, 6 cm, 7 cm, 8 cm and 9 cm in the months of April, May, June, July and August and September respectively. Also to maintain good performance at pasture it is essential to practice an effective parasite control regime.

Table 11. Effect of sward height on lamb performance in May and June

Sward height (cm)	Liveweight gain (g/d)
4	267
6	306
9	315

(Grennan and O'Riordan, 1996)

Table 12. Effect of sward height on lamb performance post weaning

Sward height (cm)	Liveweight gain (g/d)
5	115
7	141
9	162

(Grennan and O'Riordan, 1996)

Creep feeding

There is a lot of interest in creep feeding lambs presumably with the intention of finishing lambs earlier. The response to creep feeding depends on grass availability. At Athenry a number of studies have been undertaken to evaluate creep feeding and the results are summarised in Table 13. Creep feeding increased weaning weight regardless of sward height. However, it should be noted that creep feeding 300 g concentrate per lamb per day on the low swards resulted in the same level of performance as lambs grazing the high swards with no creep feed. Therefore creep feeding replaced good grassland management. Lambs offered 300 and 600 g creep/day consumed 30 and 50 kg concentrate respectively. For lambs which were offered creep feed, 14 kg concentrate was required to produce each additional 1 kg of carcass weight which is a rather poor food conversion ratio. Creep feeding reduced age to slaughter by 28 days. However increasing grass height from 5 to 6 cm reduced age at slaughter by 13 days, half the effects of feeding 32.5 kg creep/lamb.

Whilst creep feeding enables the animals to be drafted at a younger age and also most likely at a higher price, the question often asked is does it pay? Assuming market price conditions that prevailed in 2004 and 2005 lamb price declined from €3.54 in early July to €3.10/kg carcass in late October, the period when the majority of mid season fat lamb is marketed. The effect of creep feeding on carcass value of the March born lambs relative to the carcass value of lambs receiving no creep, using the prevailing market prices of 2004 and 2005, and allowing for the cost of creep consumed by the lambs at concentrate prices ranging from €150 to €325/t is presented in Table 14.

The data clearly illustrates that regardless of grass height, offering creep to lambs, which enabled slaughter at a younger age did not cover the cost of the creep within a concentrate price range from €150 to €325/t. It is also observed that increasing sward height from 5 to 6 cm increased carcass value by €2.50/head. Whilst no allowance has been made for the additional grass required to feed the lambs without creep feed, the grass cost will have little impact on the economics of production. Many sheep farms in Ireland are moderately stocked which enables greater production for grass at little extra cost. Prior to slaughter, 40 kg lambs consume approximately 1 kg grass DM/head per day, consequently requiring an additional 27 kg DM to finish. Whilst the total cost of grass production is €104/t DM (Table 10) the cash cost is €44/t DM. Consequently, the additional grass required without creep feeding would cost €1.18. Even allowing for grass cost, creep feeding concentrate at a cost greater than €175 does not break even. Furthermore the producer requires additional returns to cover the cost of purchase of feeders, concentrate storage and labour. Also if lambs are fed creep to finish early, the producer must establish what, if any, is the opportunity cost of the grass remaining? It is concluded that creep feeding mid season lamb does not give an economic return.

Table 13. Effect of creep feeding and sward height on lamb weaning weight (kg)

	Creep feed (g/lamb per day)					
	Low sward height (5cm)			High sward height (6cm)		
	0	300	600	0	300	600
Weaning weight (kg)	31.4	34.3	36.9	33.7	36.7	37.5
Drafted at weaning (%)	7.3	20.7	42.8	20.4	41.2	53.7
Age at sale (days)	167	140	125	154	126	118
Creep intake (kg)	0	32.5	52.9	0	27.5	46.0

(Grennan and McNamara, 2005)

Table 14. Effect of creep feeding on carcass value (€) of March born lambs, after cost of creep, assuming market conditions of 2004/05 relative to lambs receiving no creep at two sward grazing heights (€/carcass)

	Sward height (cm)			
	5		6	
Creep feed level (g/day)	300	600	300	600
Concentrate price (€/t)				
150	-0.56	-0.55	-0.45	-2.15
175	-1.37	-1.87	-1.14	-3.30
200	-2.19	-3.19	-1.83	-4.45
225	-3.00	-4.51	-2.51	-5.60
250	-3.81	-5.84	-3.20	-6.75
275	-4.62	-7.16	-3.89	-7.90
300	-5.44	-8.48	-4.58	-9.05
325	-6.25	-9.80	-5.26	-10.20

Management practices

Changes in some farm management practices can increase efficiency of lamb production at no extra cost.

Finishing male lambs as rams

Traditionally male lambs were castrated to facilitate management post weaning when lambs are reaching sexual maturity. However there is plenty of evidence from other species, e.g. beef cattle, that finishing the male progeny entire increases growth rate, food conversion efficiency and produces leaner carcasses. A major study was completed at Athenry to evaluate the effect of finishing male lambs entire (as rams) on animal performance. The results are presented in Table 15. Lambs finished entire were 1.8 kg heavier at weaning, produced leaner carcasses and were slaughtered 16 days earlier than lambs which were castrated shortly after birth. The data clearly show that finishing male lambs entire increases performance. Finishing lambs entire, improved efficiency by 13c/kg for male lambs or by 7c/kg if all progeny from the flock are slaughtered, similar to the response obtained from choice of terminal sire breed. However it should be noted that post weaning ram lambs should be

managed separately from ewe lambs, otherwise, the potential benefits in growth rate will be foregone as young rams will be very active in the presence of females. Furthermore if the current production system is not capable of delivering the majority of lambs to slaughter by late August, then the potential advantages of leaving lambs entire is reduced and product quality may be compromised.

Table 15. Effects of finishing male lambs entire on animal performance

	Treatment	
	Castrated	Entire
Weaning weight (kg)	29.9	31.7
Carcass weight (kg)	18.2	18.1
Kill out (%)	44	43
Fat score[1]	3.1	2.9
Sale date	24 August	8 August

[1] Fat score 1 to 5

(Hanrahan, 1999)

Winter shearing

All sheep must be shorn once per year. At current wool price and shearing cost, the value of the fleece does not cover the expense of shearing. A recent study at this Research Centre has evaluated the impact of shearing housed ewes in mid pregnancy or grazing out doors all winter and lambing at pasture on subsequent lamb performance. Ewes which were shorn had their fleeces removed in mid December. All sheep lambed in early March. The effects on lamb performance are presented in Table 16. Shearing housed ewes had the same impact on lamb birth weight and subsequent performance as outwintering on grass and lambing outdoors. Shearing increased lamb birth weight by 0.6 kg/lamb and weaning weight by 2.4 kg relative to lambs from ewes which were housed but not shorn. The data from this study illustrate, that shearing housed ewes increases subsequent lamb performance such that they are fit for slaughter two weeks earlier than lambs from housed ewes which were unshorn. The increased weaning weight due to winter shearing improves efficiency of lamb production by 15c/kg carcass. Furthermore

shearing facilitates management and reduces fixed costs as space requirements at the trough and in the house are reduced.

Table 16. The effects of shearing housed ewes and outdoor lambing on subsequent lamb performance

	Ewe treatment		
	Indoors unshorn	Indoors shorn	Outdoors Unshorn
Lamb birth weight (kg)	4.2	4.8	4.9
Liveweight gain (g/d) (birth – weaning)	288	307	312
Weaning weight (kg)	32.4	34.8	35.2

(Keady et al, 2006)

Condition score

Condition score is a method of accessing the fatness or condition of animals. It is assessed by handling the ewe over and round the back bone, in the area of the loin behind the last rib. Condition score is based on a scale from one to five where one and five represent extremely thin and fat ewes respectively. In dairying and suckler cow production, condition score is a management tool used in late lactation, at calving and during the breeding season to monitor cow condition score change. In sheep production the most important time to have the ewes in the optimum condition is at the time of joining the rams with the flock. The effects of condition score of the ewes at the beginning of the breeding season on subsequent flock productivity has been studied by Teagasc. Work undertaken on 40 commercial farms as part of the TET project by Teagasc concluded that each one unit increase in condition score within the range of 2.5 to 4.5 increases ewe liveweight by 12 kg and lambs weaned per ewe joined by 0.10.

Is there a viable future for sheep production?

Many different aspects of mid season fat lamb production have been discussed in the current paper. Maximum potential and “achievable potential in practice” improvements in efficiency which are possible on Irish sheep

farms are presented in Table 17. The data in this Table demonstrate that if all the individual potential improvements in efficiency for genetics of the sheep flock, and in nutrition and management of the ewe and lamb were achieved, the cost of production could be reduced by up to 132 c/kg carcass. However, whilst all of the individual improvements are possible, they are not all cumulative and consequently are not possible for every lamb finished. However, on most farms it should be possible to achieve half of the "potential in practice improvements" in efficiency. Therefore improvements in efficiency could reduce cost of production by up to 66c/kg carcass. Average lamb price for 2004 was €3.66/kg carcass. In addition €1.43 was received in subsidy per kg of lamb carcass produced. Consequently, even allowing for an improvement in efficiency of 66c/kg lamb carcass produced the producer would require €4.43/kg carcass to maintain the income received in 2004 prior to implementation of the Mid Term Review of the Common Agricultural Policy.

Table 17. Opportunities to improve efficiency and profitability in sheep production

	€ / head		
	Maximum Potential	Potential in Practice	Carcass (c/kg)
Ewe genotype	22	13	48
Grassland	10	5.0	26
Silage	7.5	3.20	16
Winter shearing	2.9	2.9	15
Condition score	6	3	11
Entire progeny	2.5	1.3	7
Terminal sire breed	3.0	1.4	7
Concentrate	0.6	0.4	2

It is of interest to note from Table 17, that two of the most discussed topics by sheep producers, namely terminal sire breed and concentrate price, have the smallest impact on improving efficiency. The factors which have the greatest impact on efficiency are ewe genotype, grassland management, winter shearing and high quality grass silage.

Conclusions

It is concluded that:-

1. Improvements in efficiency pre farm gate of up to 66c/kg carcass are possible.
2. The major factors, in order of importance, to improve efficiency pre farm gate are as follows
    1) Increasing litter size. Use Belclare or a breed with similar genetic merit.
    2) Good grassland management. Use sward height as a management tool.
    3) Winter shearing of housed ewes to reduce age at slaughter of the progeny.
    4) Produce high quality grass silage (greater than 75%DMD) for feeding housed ewes in mid and late pregnancy.
    5) Finish male lambs entire provided they are offered a good plane of nutrition.
    6) Use a mixture of straights as supplements to reduce concentrate cost.
    7) Choice of terminal sire breed. Suffolk, Charollais, Texel and Belclare are probably the only breeds which merit serious consideration.
    8) Creep feeding does not provide a return to the producer of mid season fat lamb, even allowing for earlier drafting and assuming market price changes during 2004 and 2005.

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