

## **Key issues affecting lamb performance from pasture**

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### **Introduction**

Ireland is the largest net exporter of lamb in Europe with exports accounting for 78% of lamb production. Prime lamb production in Ireland is grass-based and seasonal, with lambing normally targeted to coincide with the start of the grass growth in spring.

### **Factors contributing to lamb performance from pasture**

In intensive systems of mid-season prime lamb production grazed grass accounts for 86% of total dry matter intake. For singles, twins and triplets target pre-weaning liveweight gains from birth to weaning are 340, 295 and 290 g/day, and target post weaning daily liveweight gains are 200, 195 and 175 g/day, respectively. Factors affecting lamb performance from pasture are discussed in this paper.

#### **1. Lamb birth weight**

Studies at Athenry have shown that each 0.5 kg increase in lamb birth weight increases subsequent weaning weight by 1.6 kg. Lamb birth weight is influenced by many factors including management and nutrition during mid and late pregnancy. Shearing ewes at housing (mid December) increased lamb birth weight by 0.6 kg. Relative to housed unshorn ewes, ewes that were extended grazed during mid pregnancy, late pregnancy or throughout pregnancy produced lambs which were 0.18, 0.37 and 0.59 kg heavier at birth. Ewes that are housed during mid and late pregnancy are normally offered grass silage supplemented with concentrates in late pregnancy. Each 5 percentage unit increase in silage DMD increases lamb birth weight and ewe weight post lambing by 0.26 kg and 6.5 kg, respectively. The response to concentrate feed level in late pregnancy is dependent on forage feed value. For example, increasing the quantity of concentrate offered in late pregnancy from 15 to 25 kg for grass silages with DMD's of 69% and 75% increased lamb birth weight by 0.5 and 0.1 kg, respectively. Replacing rapeseed, maize distillers and maize gluten with soyabean meal as the protein source increased lamb birth weight by 0.36 kg, equivalent to the response of increasing the feed level of the non-soya-based concentrate from 16 to 28 kg during late pregnancy.

#### **2. Grassland management**

To achieve optimum levels of lamb performance from grazed grass, pasture must be managed to maximise the proportion of leaf in the sward canopy, thus maintaining herbage digestibility and intake potential. Sward height measurement is the easiest and most effective way of managing

pasture. Target post-grazing sward heights for rotational grazing systems, are 3.5–4, 4.5–5, and 5.5–6 cm for April, May and June, respectively

### **3. Male lamb management**

Previous studies at Athenry have shown that castration reduced lamb weaning weight by 1.8 kg whilst increasing the age at slaughter by 16 days, consequently reducing the price received per kilogram carcass as carcass price normally declines as the season progresses. Meanwhile, for the loss of revenue the producer has not produced a product of superior meat quality. An extensive review of the literature has concluded that “where male lambs are reared on an all-grass diet and slaughtered by the end of the grazing season, leaving male lambs entire has no negative effect on meat quality, whether assessment is laboratory based or through in-home consumer tasting”.

### **4. Concentrate (creep) feeding to lambs at pasture**

The lamb performance response to concentrate feeding depends on grass supply and digestibility, and on the level of concentrate offered. A four year study at Athenry involved evaluating the effect of grass supply and concentrate feed level on lamb performance (Table 1.) The data clearly show that high levels of lamb performance were achieved from grass as the sole diet in a set-stocked grazing system. Increasing concentrate creep feed level increased lamb performance and reduced the age at slaughter, regardless of sward height.

**Table 1. The effects of concentrate feed levels and grass availability on lamb performance**

	Concentrate feed (g/lamb per day)					
	Low sward height (5cm)			High sward height (6 cm)		
	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
Concentrate intake (kg)	0	32.5	52.9	0	27.5	46.0

Lambs offered a maximum of 300 g or 600 g concentrate/day consumed 30 kg and 50 kg concentrate, respectively, from birth to slaughter. Feeding 300 g concentrate per lamb daily on the low sward resulted in the same level of lamb performance pre-weaning as lambs grazing the high sward without concentrate supplementation. Therefore, concentrate feeding replaced good grassland management. Concentrate feeding reduced the age to slaughter by 28 days. However, increasing grass height from 5 cm to 6 cm reduced the age at slaughter by 13 days, equivalent to feeding 16.3 kg concentrate per lamb from birth to slaughter. Previous studies at Athenry have shown that shearing ewes at housing increased subsequent lamb weaning weight by 2.2 kg, which is equivalent to the response to feeding 22 kg concentrate per lamb from birth to weaning. The data clearly shows that creep feeding at pasture increases lamb performance, and that the magnitude of the response is dependent grass supply.

To determine the potential financial implication of feeding concentrate it is essential to include the drafting information and individual carcass weight data for all lambs for the entire flock. The drafting data from a commercial mid-season prime lamb producing flock for 2008 to 2012 were collated and analysed. No concentrate was offered to lambs reared as singles or twins whilst lambs reared as triplets received up to 300 g concentrate daily, until weaning. Carcass value actually received and the carcass value that would have been realised had the lambs been offered concentrate (based on selling 4 weeks earlier) were collated to estimate the effect on financial returns. The analysis clearly showed that feeding concentrate increased the price received per kilogram (by between 11 and 79 c/kg depending on year) of lamb carcass for the first draft of lambs. However, when the increased price which would have been received due to earlier drafting as a result of concentrate feeding is calculated for the whole flock the increase in average carcass price was 2, 10, 22, 11 and 11 c/kg in 2008, 2009, 2010, 2011 and 2012, respectively. This clearly illustrates that whilst concentrate feeding reduced the age of slaughter by 28 days it had relatively marginal effects on the average price received per kilogram of lamb carcass for the whole flock. Lambs offered concentrate up to a maximum of 300 g per day consume 30 kg of concentrate prior to slaughter. The cost of concentrate consumed by lambs prior to slaughter is €9, €10.50 and €12 when concentrate costs are €300, €350 and €400/t respectively. In order for the extra carcass price to cover the cost of concentrate consumed by the flock, the concentrate would need to have been purchased for €14.5/t, €70/t, €144/t, €83/t and €87/t, respectively, in 2008 to 2012. In the costing exercise no value was attributed to the grass that was not consumed due to earlier sale of lambs offered concentrate because the opportunity value of the grass on a sheep farm in the summer is relatively low. However no cost has been included for the price of the feeders or the labour required to feed the concentrate daily. This analysis shows that under the market conditions that prevailed from 2008 to 2012, the extra carcass value received due to concentrate feeding at pasture in mid-season prime lamb producing flocks did not even come close to covering the cost of concentrate offered. Therefore, to improve financial margins the majority of producers should focus on improving grassland management which is low cost, rather than trying to replace poor grassland management with concentrate which is an expensive solution.

##### **5. Have alternative forages a role in finishing lambs?**

The effects of tyfon and chicory, grazed either as pure stands or in combination with perennial ryegrass, on lamb performance post-weaning were evaluated in a grazing study at Athenry. The following five treatments were evaluated: perennial ryegrass (PRG), chicory plus PRG, tyfon plus PRG, chicory and tyfon. The performance of lambs grazing old permanent pasture (sixth treatment) was the benchmark to determine the benefits from reseeding per se. It is perceived by some producers that including alternative crops such as tyfon results in high rates of live-weight gain

during the first weeks of grazing. This was not evident in this study (Table 2). High levels of lamb performance (overall average 217 g/day) were achieved throughout the study. Lambs grazing the old permanent pasture produced essentially the same daily live-weight gain as the lambs on the new perennial ryegrass sward or the other treatments. Relative to the new perennial ryegrass sward, including chicory in the seed mixture reduced live-weight gain by 36 g/day, though kill-out percentage was increased by 1.2% units. Including tyfon in the seed mixture had no effect on lamb performance. Grazing pure stands of tyfon or chicory did not affect performance relative to lambs grazing the new perennial ryegrass pasture or the old permanent pasture. Lambs that grazed the old permanent pasture, the new perennial ryegrass sward or the tyfon plus perennial ryegrass sward had similar drafting patterns.

**Table 2. Effect of sward type on lamb performance**

	Sward type					
	Perennial ryegrass (PRG)	Tyfon + PRG	Tyfon only	Chicory + PRG	Chicory only	Old permanent pasture
Live-weight gain (g/day)						
- weeks 1-3	308	244	184	240	167	284
- start to finish	226	220	213	190	226	219
Carcass weight (kg)	19.0	18.9	19.0	19.6	19.8	19.0
Kill out (%)	42.1	42.6	42.9	43.2	43.4	42.1

Sward type had a major impact on stock carrying capacity, and therefore on live-weight gain per hectare. The tyfon/ryegrass, chicory/ryegrass, tyfon and chicory swards sustained 90, 87, 93 and 58% of the liveweight gain produced from the perennial ryegrass reseeded sward, respectively. The results of this study show that there was no benefit from re-seeding, or from the inclusion of either tyfon or chicory in the seed mixture, on lamb performance post-weaning. Also re-seeding with the objective of producing tyfon for lambs post-weaning involves removing paddocks from the grazing cycle at the time of peak herbage demand one month prior to weaning. At this time of the year the objective should be to conserve winter forage supplies whilst at the same time maintaining lamb growth rate during the last 4 to 6 weeks prior to weaning by providing a continuous supply of high feed value grass to the flock. Whilst re-seeding showed no benefit in lamb performance, newly reseeded pastures have been shown to increase herbage production, particularly at the beginning and end of the grazing season. On moderately stocked farms improving grassland management provides a cheaper alternative to improving lamb performance from pasture than reseeded. If re-seeding is to be undertaken, the ideal time is late July or August (when grass demand is reduced); this subsequently provides high feed value grass for finishing lambs in September and for preparing the ewe flock for the breeding.

## **Effect of weaning weight on drafting pattern**

Increasing lamb performance pre weaning enables lambs to be drafted for slaughter at a younger age. Drafting data were collated for the Athentry flock from 2006 to 2012 inclusive. Based on these data each 1 kg increase in weaning weight reduced age at which 50% and 75% of lambs were drafted for sale by 7.1 and 6.6 days, respectively.

## **Conclusions**

1. Each 1 kg increase in weaning weight reduces age at slaughter by 6 to 7 days.
2. To achieve high levels and lamb performance from grazed pasture:
  - (a) Increase lamb birth weight - each 0.5 kg increase in lamb birth weight increases weaning weight by 1.6 kg and reduces days to slaughter by 12 days.
  - (b) Leave male lambs entire.
  - (c) Close paddocks from early November in rotation -post grazing sward height of 4 cm.
  - (d) For a rotational grazing system target post-grazing sward heights are 3.5, 4.5 and 5.5 cm for April, May and June respectively.
  - (e) Remove paddocks from the grazing system when there is an estimated 12- 15 days grass supply ahead of the flock.
  - (f) Allocate the highest feed value pasture to lambs post-weaning, i.e., aftergrass or graze lambs in a leader-follower system – the lambs as leaders ahead of the ewes.
  - (g) When grass supply is scarce in April, grazing to a post-grazing sward height of <3 cm for 2 weeks does not require concentrate supplementation for the ewes.
3. Concentrate feeding lambs at pasture:
  - (a) As grass supply and concentrate feed level increase, response to concentrate, as determined by lamb live-weight gain per kilogram concentrate, decreases.
  - (b) For the majority of mid-season prime lamb producers feeding concentrate is not financially justifiable.
  - (c) Sheep producers should invest in good grassland management, rather than concentrates. This will increase financial margins and reduce labour requirements.
4. Alternative forages:
  - (a) Do not increase lamb performance relative to well-managed old permanent pasture.
  - (b) When growing alternative forages the emphasis/focus of the producer may change from increasing flock productivity to growing the alternative forage crop.
  - (c) On moderately stocked farms (i.e., < 9 ewes/ha) emphasis should be on managing existing swards rather than re-seeding.
  - (d) On a sheep farm re-seeding should occur in early autumn when herbage demand is relatively low as the lambs are weaned /sold and winter forage has been conserved.