

## End of Project Reports: Sheep Series

Project 4185

# Reducing the seasonality of prime lamb production



Research Centre, Athenry, Co. Galway

# Reducing the seasonality of prime lamb production

by

**E.J.Grennan**  
**Sheep Production Department**  
**Teagasc Research Centre**  
**Athenry, Co. Galway**

*Teagasc acknowledges the support of the European Union  
Structural Funds (EAGGF) in the financing of this project*

ISBN 1 84170 004 5

October 1998

## CONTENTS

<b>Contents</b>	<b>i</b>
<b>Acknowledgements</b>	<b>i</b>
<b>Summary</b>	<b>ii</b>
<b>Introduction</b>	<b>1</b>
<b>Flock Management</b>	<b>2</b>
<b>Grassland Management</b>	<b>5</b>
<b>Results</b>	<b>7</b>
<b>Conclusions</b>	<b>11</b>
<b>References</b>	<b>12</b>
<b>Appendices</b>	<b>13</b>

### *Acknowledgements*

The author wishes to acknowledge the assistance and helpful discussions with Dr. J.P. Hanrahan. Thanks are conveyed to Mr. S. Murphy for supervision and management of flocks and data collection and to Ms. A. Curley for technical assistance.

## SUMMARY

Lambing part of the national lowland flock in April to late May has potential to reduce the seasonality of supply and extend the season for prime young lamb. This would, potentially, enhance ability to maintain and increase market share for Irish lamb.

A farmlet system was operated over two years, with some 50 ewes on 4 ha of pasture. The objectives were: to assess the overall performance of a flock lambing in mid to late April : to monitor lamb growth rate and drafting patterns for lambs; to determine the changes in feed demand over the season; to identify any saving in feed costs, and any difficulties that may arise with late lambing.

The feed demand over the grazing season differs from normal March lambing. A grass surplus tends to occur in April/May and a deficit in November/December, and this imbalance between supply and demand increases if lambing is in late May. The balance between feed demand and supply may be more easily achieved where sheep are combined with cattle or tillage.

Results show that a late-lambing flock can be managed successfully on an all-grass farm. If lambing takes place from mid-April to late May, some lambs will finish off pasture in September/October. Remainder can be finished indoor on silage with concentrate supplementation for sale in October to February.

Lambing from mid-April onwards allows ewes to be at pasture for 4 to 6 weeks pre-lambing and concentrate feeding to ewes pre or post lambing should not be necessary. However this saving on concentrate input is offset by the need for concentrates to finish lambs.

Lamb growth rate on pasture to weaning will be somewhat lower than with March lambing, due to deterioration in pasture digestibility in mid-season. A high standard of grassland management is critical to maintain pastures leafy, in order to achieve high lamb growth rate pre and post weaning.

Profitability will depend on supplying niche markets with younger lambs at premium prices.

## INTRODUCTION

In lowland flocks spring lambing is concentrated mainly in late February and March, coinciding with the availability of grass for ewes after lambing. This compact lambing results in a high proportion of lambs being drafted for sale in July through October; a period when lamb prices are generally lower than earlier or later in the season. In recent years in Britain, and to a lesser extent in Ireland, there has been interest among some producers in lambing later in the season, i.e. April to May. The reasons why farmers may adopt later lambing include:

1. To reduce costs of production in terms of housing, feed and labour.
2. To sell lambs, either as stores or finished, in the October to February period at higher prices.

From the industry point of view it is desirable to reduce the seasonality of supply, to extend the season for prime young lamb and become less dependent on older lambs to meet market requirements in the November to February period.

Some features associated with late lambing in comparison with spring lambing flocks include:

- lower labour costs associated with outdoor lambing
- lower concentrate costs for ewes pre/post lambing
- less prolapse and pregnancy toxæmia in ewes
- lower lambing percentage (of the order of 10 to 15%) compared with spring lambing
- lower levels of infectious diseases and lamb mortality, associated with outdoor lambing on clean pasture in favourable weather
- danger period for *Nematodirus* may have passed before lambs start to graze, particularly with May lambing
- over-winter worm infection on pasture will also be declining before lambs begin to graze.
- a change in the seasonal demand for grass
- more grass available at lambing, so ewes have more milk
- higher demand for autumn grass especially if lambs are retained for finishing rather than sold as stores
- more lambs sold as stores

Some disadvantages to adopting late lambing include:

- ewes going on their back on pasture before lambing, especially if unshorn
- outdoor lambing difficulties in wet weather
- need for extra care for maiden ewes lambing outdoor
- work involved in tailing and castration of lambs with outdoor lambing
- danger of predation if there are few young lambs around when foxes are hungry
- lamb growth rate may be reduced due to lower pasture digestibility in late May and June

## **FLOCK MANAGEMENT GUIDELINES**

**Ewe breeds:** Ewes are mated in early December or early January for lambing at the end of April or May respectively. The breeding season tends to be longer in lowland breeds/crosses than in hill breeds. However length of breeding season is unlikely to limit breed choice for April/May lambing in lowland flocks. Therefore any of the available lowland breeds or crosses may be used. As the lambing percentage tends to be lower with late lambing, a prolific ewe type, such as Belclare or Belclare X, would be beneficial to ensure a high litter size.

**Flushing and mating ewes:** This occurs in November to early January for April and May lambing. Careful planning is required to have ewes in satisfactory body condition at mating and to have sufficient grass for ewes until early January. Ewes that are thin at weaning should be offered enough grass to recover body condition post weaning rather than trying to achieved this later in the year when grass may be scarce or of inferior quality. Data in Appendix (Table A1) show the estimated feed requirements of the flock from early October, at a range of stocking rates, for April and May lambing. It is clear that a grass cover in the range of 8 to 11 cm is required in early October to meet feed demands at stocking rates of 10 to 14 ewes/ha. To achieve this grass cover lambs will have to be removed from the grazing area in September. Autumn nitrogen applications should also be geared to achieve the required grass cover. Silage or hay may also be offered to ewes on bare pasture post weaning to conserve grass for flushing and mating. On tillage farms alternative feeds such as beet tops, roots or catch crops may also be available to supplement the pasture.

Mating occurs on pasture from late November to early January depending on lambing date chosen. If ewes are housed before mating is completed

rams may be run with ewes indoor to pick up repeats. Total indoor mating may also be possible but in Britain limited experience indicated that the incidence of barrenness may be higher with indoor mating.

**Mid-pregnancy:** (January to March). For months 2 and 3 of pregnancy, if ewes are housed, hay or silage alone will provide an adequate maintenance diet for ewes. Ewes mated late November to early December will be at this stage of pregnancy at housing in January. Those mated in early January and then housed should be offered good quality roughage *ad libitum* during the first month of pregnancy. If ewes are out-wintered autumn saved pasture would also provide an adequate diet for ewes at this time. It may be strip grazed to allow for an intake of about 1 kg of dry matter per ewe per day.

**Late Pregnancy:** Housed ewes should be turned out to pasture about mid-March, i.e. 4 to 6 weeks before lambing for late April lambing. Concentrate feeding to ewes pre-lambing should not be necessary if there is sufficient grass available, i.e. provided a sward surface height of at least 4 cm can be maintained. The feed demand per ewe pre-lambing at two litter sizes for April and May lambing is shown in Appendix (Table A2). The calculations allow for a slightly higher feed requirement in ewes with the higher litter size.

**Lambing arrangements:** This depends on flock size and individual farm circumstances. For outdoor lambing the lambing field should offer some shelter, and close proximity to buildings or handling pens would be advantageous. Hygiene and cleanliness in the lambing area are very important to avoid a build up of infectious diseases affecting young lambs. The risk of disease would be increased considerably if a late lambing flock used the same facilities as an earlier spring-lambing flock and should be avoided. Two outdoor lambing systems used are:

**System 1** Ewes highly stocked in the lambing field (up to 50/ha) and ewes/lambs transported to grazing area after lambing. Pens are located together in a corner of a field and moved to new location each year. Alternatively individual pens are located around the lambing field and moved to a clean patch after each ewe/lambs. New born lambs/ewe are put into these pens for a few hours for mothering up/tailing/castration/naval treatment etc.

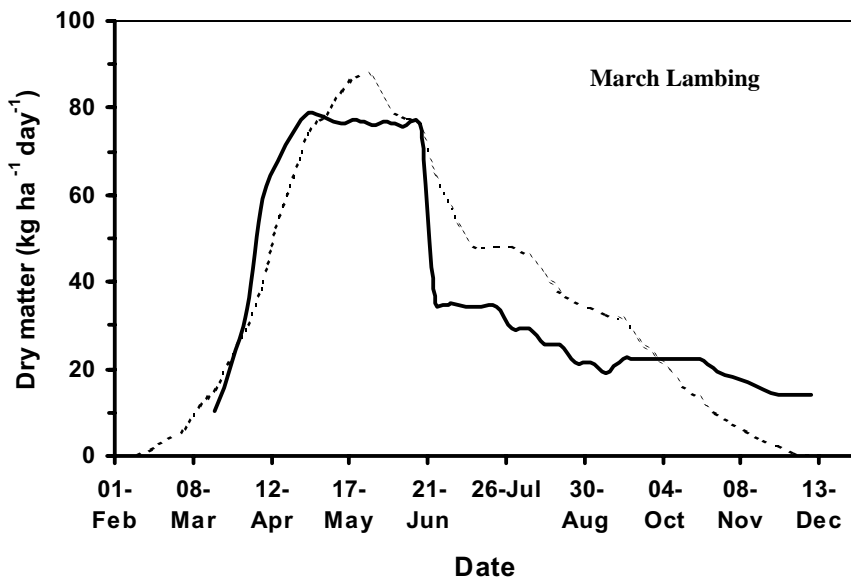
**System 2** Ewes are stocked pre-lambing on the summer grazing area (12-15/ha) and lamb in a “set-stocking” system. Mobile pens are available and taken to individual ewes needing attention.

If ewes are brought indoor for lambing care is needed to avoid sudden diet changes close to lambing. At Belclare pregnant ewes were indoor at night and at pasture by day and this was satisfactory with a small flock of 50 ewes. It facilitated supervision at lambing, and avoided sudden or major et changes.

**Lamb growth:** On high-quality ryegrass/clover swards high lamb growth rates can be achieved with late lambing and some lambs will finish off pasture in September/October. Lower lamb growth rates, due to seasonal decline in pasture quality, results in fewer lambs drafted off pasture and more store lambs in autumn. Depending on farm circumstances these may be sold as stores, or finished on the farm and marketed in October to February.

**Grassland management:** Late lambing changes the requirement for silage for ewes and lambs and the seasonal feed demand for grazing. The silage requirements for ewes and for finishing lambs and also the area required to be closed for first cut silage at a range of stocking rates and litter sizes for April and May lambing are given in the Appendix (Table A3). The feed demand per ewe and her lambs for grazing over the full season (excluding silage), taking account of the expected drafting pattern for lambs (Appendix, Table A4) is shown in Appendix (Table A2). Figures 1 and 2 show a typical grass growth curve for a sward yielding 11.2 t dry matter/ha, and also the feed requirements on the grazed area for March, (Fig. 1) and April or May (Fig. 2) lambing at a stocking rate of 14 ewes/ha, and 1.4 lambs per ewe, when the silage requirements are all taken in one cut in late May. With normal March lambing there is a good balance between grass growth and feed demand. A grass surplus may occur in late May/early June and can be removed as silage. Grass accumulated by late September is available to meet flock requirements in October/November when demand exceeds grass growth.





**Figure 1: Grass growth rate ( ---- ) and feed demand ( \_\_\_ ) for an annual stocking rate of 14 ewes/ha with 1.4 lambs/ewe**

With late April lambing feed demand peaks in early to mid June before aftergrass becomes available. Grass growth exceeds demand in April/May while there is a deficit in November/December for flushing and mating. To help overcome this imbalance between supply and demand the timing of fertiliser N applications may be adjusted with more being applied in the second half of the year. Surplus grass harvested in May could also be offered to ewes on bare pasture pre-flushing as indicated earlier.

With late-May lambing the problem of an imbalance between feed supply and demand across the grazing season is increased and makes it more difficult to manage grass in an all sheep production system; it may be more easily managed in a mixed grazing system with cattle. Any early season grass surplus can be removed as silage while the demand for grass at the end of the season is reduced for the lower stocking rate of ewes. The seasonal feed demand for grazing at 14 ewes/ha for April and May lambing is shown in Fig. 2. The rate and timing of nitrogen applications for

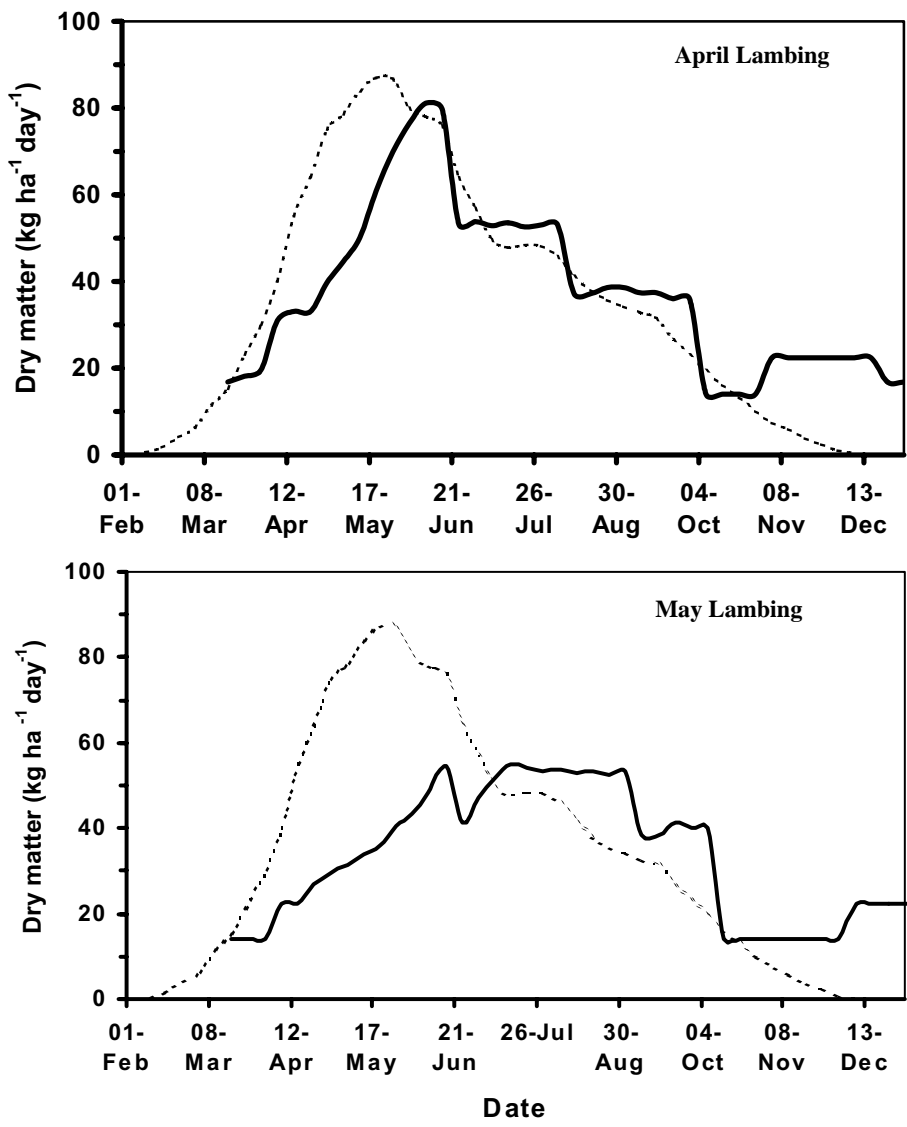


Figure 2: Grass growth rate (----) and feed demand (—) for an annual stocking rate of 14 ewes/ha with 1.4 lambs/ewe

for grazing should be adjusted according to the stocking rate and date of lambing.

Total feed requirements, including grazing, silage and concentrates, per ewe plus her lambs, for two litter sizes and two lambing dates are shown in Table A5 (Appendix). Carcass output estimates assume all lambs are finished at a mean carcass weight of 18.5 kg. Total dry matter intake required to produce 1 kg of carcass ranges from about 27 to 32 kg, depending on the number of lambs reared per ewe.

**Concentrates for finishing lambs:** In an all-grass system lambs not drafted off pasture may be finished indoor on silage with concentrate supplementation. The concentrates required for lambs depends on silage quality and lamb weight at housing. The latter will depend on lambing date, litter size and growth rate achieved on pasture. In experiments at Belclare spring born lambs, 32 to 36 kg liveweight, were finished indoor in 5 to 9 weeks on baled silage with concentrate supplementation at rates of 250 to 550 g/lamb/day. Data in Table A6 (Appendix) give an estimate of the concentrates required to finish lambs indoor on silage. It is evident that the cost saving achieved in late lambing by not feeding concentrates to ewes pre-lambing may be offset by the concentrates required to finish lambs. Spring born lambs were also finished on pasture at Belclare in October and November with concentrate supplementation at rates of 250 to 550 g/day. This is an alternative method of finishing late lambs.

## RESULTS

**Year 1:** A farmlet system was operated with 50 ewes on 4 ha of pasture in 6 paddocks. The flock of Cambridge-cross adult ewes was assembled in autumn 1995. They were mated in mid November to Suffolk rams for lambing 10 April. Ewes were housed on 18 December and shorn. Double-chop silage was offered *ad libitum*, and concentrate supplements were offered at normal rates from 6 weeks pre-lambing. Ewes were turned out to pasture on 19 March, (3 weeks pre lambing). Although there was sufficient grass available, concentrate supplementation was continued until lambing because of the expected high litter size of the ewes. Ewes lambed indoor and were returned to pasture within a few days with an average of 1.56 lambs per ewe (extra lambs were artificially reared). Ewes were stocked at about 20 per ha until weaning on 15 July. Silage for wintering the ewes was obtained from 36 percent of the area, closed 10 April and cut 5 June. A 2nd cut on 21 percent of the area, closed 11 June and cut 18 July provided silage

for finishing lambs. Weaned lambs were stocked initially at about 36 per ha, decreasing as lambs were drafted for sale and aftergrass became available after the 2nd cut of silage. Lambs were drafted for sale as they were fit and remaining lambs were housed on 3 October. They were finished on baled silage with concentrate supplementation at 350g/d. Ewes were mated on 4 December for lambing 30 April, 1997. There was enough grass for flushing and mating ewes and they were housed on 7 January.

Lamb growth rates were generally satisfactory. The average weaning weight of 28.8 kg, and growth rate to weaning of 252 g/day was somewhat lower than for normal spring lambing. This was in line with expectations because the growth rate of unweaned March-born lambs in June is often low due to deterioration in pasture quality. Average growth rates from weaning to housing on 3 October was high at 181 g/day and is attributed to the availability of a grass/clover sward (1 ha) for lambs at weaning in July and aftergrass (0.8 ha) in August. It resulted in 56 percent of lambs being drafted for sale by 18 September at 41.4 kg liveweight and 19.1 kg carcass weight. The remaining lambs, finished indoor, were drafted at an average 43 kg liveweight and 18.8 kg carcass. Average concentrates fed to lambs finished indoor was 12.8 kg or 423 kg to all lambs finished on silage. This is equivalent to 5.6 kg to all lambs sold or 8.5 kg per ewe in the flock. The drafting pattern for lambs is shown in Table 1.

**Table 1: Drafting dates for lambs in the late-lambing system**

<b>Date</b>	<b>% Drafted</b>
2 August	7
2 September	32
18 September	56
29 October	89
3 December	97
7 January	100

The lambing date (10 April) and good growth rate of weaned lambs resulted in a higher proportion of lambs being drafted off pasture by September than was anticipated for a late lambing system. Delaying the lambing date to the end of April should result in the average sale date being about 3 weeks later. The level of concentrates fed to lambs finishing on silage could also be adjusted. On tillage farms alternative feed sources may be available for finishing lambs in autumn. Lambs must be removed from the grazing area early enough in autumn to allow sufficient grass for flushing and mating

ewes in the November/December period. This is necessary to ensure that ewes are in good body condition and may help to prevent a reduction in lambing percentage experienced by some farmers in a late-lambing system.

**Year 2:** A farmllet system was operated with 52 Belclare cross ewes on 4 ha of pasture in 6 paddocks. To help ensure that there was sufficient grass for the mating season some baled silage was fed at pasture for 2 weeks pre-flushing in early November. Ewes grazed good quality pasture from mid-November. Ewes were sponged and mated 4 December for lambing about 30 April. No PMSG was used at sponge removal. The flock was housed on 7 January and shorn. A silage only diet was fed indoor until ewes were turned out to pasture on 10 March. Some silage was also fed at pasture until 23 March when there was adequate grass available for the flock. No concentrates were offered to ewes pre-lambing as grass, *ad-libitum*, was considered adequate. At lambing ewes were indoor at night and at pasture by day to avoid sudden diet changes and for ease of supervision. First cut silage was taken from 35% of the area and the ewes (plus lambs) were stocked at about 19/ha in May/June until aftergrass became available in late June. Lambs were weaned at 14 weeks (7 August), and continued at pasture until 14 October. The lambs were then finished indoor on a diet of silage with concentrate supplementation. Concentrates were offered initially at 250 g/day for 2 weeks; this was increased to 500 g/day from 30 October to 15 December, and to 600 g/day until 12 January. Lambs were drafted for sale in 3 groups: 30 lambs on 1 December, 15 on 15 December and 45 on 12 January.

From 52 ewes mated, 90 lambs were sold including 12 artificially reared, (1.73 lambs sold per ewe joined). Lamb growth rate to weaning (225 g/day) was lower than in year 1. Growth rates from 5 to 14 weeks in particular at 204 g/day, was lower than expected in mid-season. This is attributed to the fact that the pasture became somewhat stemmy in mid-season at a time when young lambs are increasing their grass intake in (June/July). It resulted in the average weaning weight (26.6 kg) being about 2 kg lower than in year 1. Growth rate of weaned lambs on pasture averaged 181 g/day up to 5 September and 119 g/day thereafter up to housing in October, giving an average rate of 152 g/day on pasture post-weaning. This is the type of growth rate usually achieved in March lambing flocks when medium quality pasture is available *ad libitum*. Higher growth rates of about 180 g/day would be expected if aftergrass or clover swards are available. At housing lamb liveweight averaged 35.3 kg and no lambs were drafted for sale off pasture. Data on drafting pattern, lamb weight and concentrates used to

finish lambs are shown in Table 2. The level of concentrates required to finish lambs was high and averaged 33 kg/lamb.

**Table 2: Sale weight, carcass weight and concentrates used**

<b>Date</b>	<b>No.</b>	<b>liveweight (kg)</b>	<b>Carcass wt. (kg)</b>	<b>Concentrates (kg/lamb)</b>
1 Dec	30	44.3	19.6	20
15 Dec	15	40.6	17.9	27
12 Jan	45	39.2	17.9	44

Results in Year 2 with 30 April lambing highlight the importance of maintaining pasture quality in June/July to achieve high lamb weaning weights. High quality pasture is also required in August/September to achieve good growth rates post-weaning. Finally high quality, precision-chop silage would improve intake and reduce the concentrate supplementation required to finish lambs indoor.

## Conclusions

- A late lambing system can be operated successfully on an all-grass farm. However the seasonal demand for grass for grazing is different from normal March lambing and is out of synchrony with normal grass growth pattern.
- Lamb growth rate to weaning is lower than for March lambing, due to a decline in pasture digestibility in mid-season.
- Some lambs will finish off pasture in September/October. The remainder can be finished indoor on silage, with concentrate supplementation, for sale in October to February.
- Concentrate supplementation may also be used to finish lambs on pasture in October/November. On tillage farms alternative feeds such as roots, beet-tops or catch crops may be available to finish lambs or supplement autumn pasture for ewes.
- The profitability of late lambing, compared with normal spring lambing, will largely depend on how lambs prices change over the season. Late May born lambs may be more acceptable on the market in October to February than older March-born lambs but this would need to be evaluated.

## REFERENCES

- Vulich, S.A., O’Riordan, E.G. and Hanrahan, J.P. 1991.** Effect of litter size on herbage intake at pasture by ewes and their progeny. *Anim. Prod.* **53**, 191-197.
- Grennan, E.J. and Murphy, S. 1996.** Performance of lambs on baled silage and concentrate supplements. *Proc. Agric. Research Forum*, pp83-84 and *Irish Journal of Agriculture and Food Research*, **35**: 77 (Abstract).
- Grennan, E.J. 1996.** Effect of concentrate supplementation on lambs at pasture post weaning. *Proc. Agric. Research Forum*, pp85-86.
- Grennan, E.J. and Murphy 1997.** Effect of creep feeding and creep grazing on lamb growth to weaning. *Proc. Agric. Research Forum*, pp307-308, and *Irish Journal of Agriculture and Food Research*, **36**: 128 (Abstract).
- Grennan, E.J. and Murphy, S. 1997.** Effect of grazing management on lamb growth preweaning in June. *Proc. Agric. Research Forum*, pp303-304.
- Grennan, E.J. 1997.** Lamb performance in a late lambing system. *Proc. Agric. Research Forum*, pp305-306.
- Grennan, E.J. 1997.** Lamb growth and drafting pattern in a late lambing system. *Irish Journal of Agriculture and Food Research*, **36**: 128 (Abstract).
- Grennan, E.J. 1998.** Lamb performance in a late lambing system. *Proc. Agric. Research Forum*, pp131-132 and *Irish Journal of Agriculture and Food Research*, **37**, 120.
- Grennan, E.J. 1998.** Effect of creep feeding spring born lambs set stocked at two sward heights pre-weaning. *Proc. Agric. Research Forum*, pp129-130 and *Irish Journal of Agriculture and Food Research* **37**, 120.



## APPENDIX

**Table A1: Grass intake (dry matter (DM), kg/ha) by ewes in autumn (from 6 October) in late lambing systems.**

- i. Lambs removed end September
- ii. Ewes flushed and mated at pasture
- iii. April lambing ewes housed January 4  
May lambing ewes housed January 18
- iv. Grass growth :   October 12 kg DM/ha/day  
                                  November 5 kg DM/ha day
- v. Sward height post grazing, 4cm

### (a) Lambing 30 April

	Stocking rate (ewes/ha)			
	10	12	14	16
4 weeks at 1 kg/day <sup>1</sup>	280	336	392	448
7 weeks at 1.6 kg/day <sup>2</sup>	784	941	1098	1254
2 weeks at 1.2 kg/day <sup>3</sup>	168	202	235	269
Total requirement	1232	1479	1725	1971
Grass growth (Oct-Nov)	450	450	450	450
Amount required 6 Oct (kg DM/ha)	782	1029	1275	1521
Sward height (cm) <sup>4</sup>	8	9	10½	11½

### (b) Lambing 31 May

	Stocking Rate (ewes/ha)			
	10	12	14	16
9 weeks at 1 kg/day <sup>1</sup>	630	756	882	1008
6 weeks at 1.6 kg/day <sup>2</sup>	672	806	941	1075
Total requirement	1302	1562	1823	2083
Grass growth (Oct-Nov)	450	450	450	450
Amount required 6 Oct (kg DM/ha)	852	1112	1373	1633
Sward height (cm) <sup>4</sup>	8¼	9½	11	12

<sup>1</sup>pre flushing; <sup>2</sup>flushing and mating; <sup>3</sup>post mating; <sup>4</sup>assume 1 cm = 200 kg DM/ha and full utilisation of herbage above 4 cm

**Table A2: Intake (kg) of pasture dry matter per ewe and her lambs, for two lambing dates, at 1.4 or 1.7 lambs reared per ewe**

Date	Lambing 30 April		Lambing 31 May	
	1.4	1.7	1.4	1.7
17 March	1.20	1.30	1.00	1.00
24 “	1.30	1.40	1.00	1.00
31 “	1.40	1.50	1.00	1.00
7-4 April	1.50	1.60	1.00	1.00
14 “	1.60	1.70	1.00	1.00
21 “	1.60	1.70	1.20	1.30
28 “	1.92	1.92	1.30	1.40
5-5 May	2.16	2.16	1.40	1.50
12 “	2.42	2.51	1.50	1.60
19 “	2.94	3.12	1.60	1.70
26 “	3.38	3.59	1.80	1.85
2-6 June	3.70	4.00	1.92	1.95
9 “	3.92	4.16	2.16	2.18
16 “	3.86	4.13	2.42	2.51
23 “	3.80	4.10	2.94	3.12
30 “	3.84	4.17	3.38	3.59
7-7 July	3.78	4.14	3.70	4.00
14 “	3.82	4.21	3.92	4.16
21 “	3.76	4.18	3.86	4.13
28 “	3.80	4.25	3.80	4.10
4-8 August	3.80	4.25	3.84	4.17
11 “	2.66	3.06	3.78	4.14
18 “	2.66	3.06	3.82	4.21
25 “	2.76	3.14	3.76	4.18
1-9 September	2.76	3.14	3.80	4.25
8 “	2.67	3.02	2.76	3.18
15 “	2.67	3.02	2.76	3.18
22 “	2.57	2.90	2.96	3.38
29 “	2.57	2.90	2.86	3.26
6-10 October	1.00	1.00	1.00	1.00
13 “	1.00	1.00	1.00	1.00
20 “	1.00	1.00	1.00	1.00
27 “	1.00	1.00	1.00	1.00
3-11 November	1.60	1.60	1.00	1.00
10 “	1.60	1.60	1.00	1.00
17 “	1.60	1.60	1.00	1.00
24 “	1.60	1.60	1.00	1.00
1-12 December	1.60	1.60	1.00	1.00
8 “	1.60	1.60	1.60	1.60
15 “	1.60	1.60	1.60	1.60
22 “	1.20	1.20	1.60	1.60
29 “	1.20	1.20	1.60	1.60
5-1 January	-	-	1.60	1.60
12 “	-	-	1.60	1.60

**Table A3: Area required for silage for ewes and lambs****Lambing 30 April**

Ewes : 0.355 tonne/ewe  
 Lambs: 0.224 tonne/lamb

**Lambing 31 May**

Ewes: 0.320 tonne/ewe  
 Lambs: 0.280 tonne/lamb

**Area (%) cut for silage : (yield: 1<sup>st</sup> Cut = 25 t/ha at 20% DM)**

Stocking rate (ewes/ha)	Lambs reared per ewe joined	Lambing date	
		30 April	31 May
10	1.4	23.0	26.9
	1.7	24.9	29.9
12	1.4	27.6	32.3
	1.7	29.9	35.9
14	1.4	32.2	37.7
	1.7	34.9	41.9
16	1.4	36.8	43.1
	1.7	39.8	47.9

**Table A4: Estimated cumulative drafting pattern for lambs in late lambing systems (%)**

Date	Lambing 30 April	Lambing 31 May
6/8	5	-
20/8	10	-
3/9	15	-
17/9	20	5
1/10	30	10
15/10	40	15
29/10	50	20
12/11	60	30
26/11	70	40
10/12	80	50
24/12	90	60
7/1	100	70
21/1	-	80
4/2	-	90
18/2	-	100

**Table A5: Total feed intake (kg/DM) per ewe and her lambs for two lambing dates at 1.4 or 1.7 lambs reared per ewe joined**

	Lambing 30 April		Lambing 31 May	
	1.4	1.7	1.4	1.7
Grazing	689	742	622	663
Silage Ewes	71	71	64	64
Lambs	44	53	71	86
Total herbage dry matter	804	866	757	813
Meals Ewes	0	0	0	0
Lambs	22	27	35	43
Total Dry matter	826	893	792	856
Carcass output per ewe	25.9	31.5	25.9	31.5
Feed conversion rate	31.9	28.3	30.6	27.2

**Table A6: Estimated concentrate supplementation (kg) required to finish lambs indoors on silage**

Assumptions

- i. Lambing 30 April - 70% of lambs finished indoor for 8 weeks
- ii. Lambing 31 May - 90% of lambs finished indoor for 10 weeks
- iii. Concentrate supplementation offered at 400 g/day with good quality silage

	Lambing 30 April		Lambing 31 May	
	1.4	1.7	1.4	1.7
Lambs reared/ewe	1.4	1.7	1.4	1.7
Concentrates per lamb finished indoor	22.4	22.4	28.0	28.0
Concentrates per lamb reared	15.7	15.7	25.2	25.2
Concentrates per ewe in flock	22.0	26.7	35.3	42.8

Note: Performance required to achieve 1.4 or 1.7 lambs reared/ewe joined:

Ewe fertility (%)	94	94
Litter size	1.65	2.0
Lamb mortality (%)	9	10
Lambs reared/ewe joined	1.41	1.69