

Breeding from ewe lambs

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Introduction

It is estimated that the ewe replacement rate for the national lowland flock is approximately 22%. Replacement ewes normally join flocks at 18 months of age with the intention of producing their first litter at 24 months. Replacements are a major cost in mid-season prime lamb production systems (National Farm Survey data). The cost of a replacement ewe at joining the flock at approximately 18 months of age is equivalent to 25% of the value of lamb carcass output that she will produce during her lifetime. One option for reducing replacement costs is to join ewe lambs to lamb at one year of age. This should increase lifetime productivity and thus reduce cost. My objective in this article, the fourth in the current series, is to present data from an on-going study at Athenry to evaluate the effects of age at first lambing and ewe genotype on ewe lifetime performance.

Athenry study

An on-going study at Athenry was designed to evaluate the effects of age at first lambing (1 or 2 years) and ewe genotype [$\geq 75\%$ Suffolk, Suffolk x Belclare, purebred Belclare] on the lifetime performance of ewes. The Belclare and Suffolk x Belclare ewes were born at Athenry while the $\geq 75\%$ Suffolks were purchased from farms in Galway, Mayo and Roscommon. The $\geq 75\%$ Suffolks were sired by Suffolk rams and from Suffolk-X ewes. Suffolks were used as 48% of the national flock (which has a low productivity) comprise of Suffolk types. Belclares were chosen because of their proven high productivity.

Half of the ewe lambs within each genotype were joined with rams to produce their first litter at 1 year of age while the remainder were joined to produce their first litter at 2 years of age. To maximise any benefits from hybrid vigor Charollais sires were used in the current study.

All ewe lambs in this study were managed as one flock from 4 months of age until the ewe lambs were joined. At the end of joining, which lasted for 36 days, all ewes were managed as one flock

until one month post housing (early January). Whilst housed the ewes were offered high feed value grass silage (DMD = 76.5%).

From early January to 6 weeks prior to lambing ewe lambs which were joined received concentrate supplementation (250 g/day). Concentrates were offered to enable the pregnant ewe lambs meet pregnancy requirements and continue to grow. During the last 6 weeks of pregnancy ewes carrying singles, twins and triplets received 18, 26 and 33 kg concentrate respectively.

The ewe lambs that were to be joined for the first time to lamb at 2 years of age received grass silage as the sole diet during their first winter housing period.

When the ewe lambs that lambed at 1 year of age were weaned (at 15 months) they were manged as one flock with those that had not been joined the previous autumn.

At this stage of the study results from lambing at 2 years of age are available for all animals.

Ewe lamb mating management

The “ram effect” can be used to induce ewes (ewe lambs or adult ewes) to start cycling provided they are sufficiently close to the time of onset of normal cyclicity but have not entered their breeding season.

The schedule for exploiting the “ram effect” was discussed in detail in the last article (published on 30 August). In practice the ram effect can be employed to ensure that all ewes in the flock are at the stage of exhibiting overt oestrus during the first 17 days of the joining period. For the “ram effect” to work the ewes should have not been in contact (either sight or smell) with rams for the previous month.

The “ram effect” is summarised in Table 1. Fertile rams should be introduced to the flock 14 days after the rams used to induce the ‘ram effect’ were introduced; the peak mating times will be 4 and 9 days later. The reason the rams are introduced at day 14 is to allow for any short cycles and to pick up any individuals that were already cyclic at the time of ram introduction.

At Athenry the “ram effect” was used on the ewe lamb flock – the onset of the breeding season is much later than for adult ewes. All ewe lambs were raddled during the joining period and the lambing season was compact with 62 and 84% lambing within 2 and 3 weeks, respectively. This

clearly illustrates that the “ram effect” synchronised lambing. When using the “ram effect” to synchronise the mating season it is essential to have an adequate number of rams for mating (1 experience ram per about 40 ewes). Also it is essential to have adequate facilities - especially lambing pens (1 pen per 6 ewes) and labour- to cope with the flock during the lambing season.

Effect of age at lambing on ewe growth

The effect of age at first lambing on ewe body weight from 8 to 24 months of age is presented in Table 2. Ewe lambs that had been joined and those that were not joined lost 3.2 and 6.7 kg (includes loss of fleece post shearing) respectively post joining to mid pregnancy. The smaller loss of weight for those that were joined was due to they receiving concentrate supplementation. However the ewe lambs that had not been joined gained more body weight post turnout to pasture, such that by weaning at 15 months of age they were similar in body weight to those which had reared lambs. When joined at 19 months of age (at joining to lamb as 2 teeth) the ewes that had not been previously joined were 2 kg heavier than those which had been previously joined. At weaning the ewes were of similar body weight regardless of age at first joining.

Thus the results of this study show that ewes that were joined to produce their first litter at 1 year of age were of a similar body weight at 15 months to ewes that had not joined. But the trajectory to achieving body weight at 15 months was different. Therefore, provided ewe lambs which are joined to produce their first litter at 1 year of age receive an adequate plane of nutrition, there is no evidence of any negative consequences for their progress to achieving mature body weight.

Effect of age at first joining on performance of 2 tooth ewes

Does producing a litter at 1 year of age affect ewe performance when lambing at 2 years of age? This is a question often asked by producers who are considering joining ewe lambs. The effect of age at first lambing on ewe and lamb performance when lambing at 2 years of age is presented in Table 3. Lambing ewes at 1 year of age had no negative effect on litter size or the number of lambs reared per ewe joined when lambing at 2 years of age. Lambs born to ewes which had previously produced a litter were 0.3 kg heavier at birth. Age at first lambing had no effect on the number of ewes that were available for joining at 31 months of age.

Effect of ewe genotype

The effect of ewe genotype on performance, when lambing as 1 and 2 year olds, is presented in Tables 4 and 5 respectively. Regardless of age at lambing Belclare ewes had the highest litter size

and reared 0.37 and 0.29 more lambs per ewe joined than to the $\geq 75\%$ Suffolk ewes at 1 and 2 years of age. Belclare ewes lambing at 1 year of age had similar productivity (lambs reared per ewe joined) as the $\geq 75\%$ Suffolk ewes when they lambed at 2 years of age (compare Tables 4 and 5). Belclare X Suffolk ewes, at 2 years of age, reared a similar number of lambs per ewe joined as Belclare ewes.

Effect of weight at joining

An important part of the current study was to provide information on the effect of weight at joining on the performance of ewes lambing at 1 year of age. The effect of weight at joining on the probability of a ewe rearing at least one lamb when lambing at 1 year of age is presented in Figure 1. The data presented in Figure 1 reflect differences due to ewe and lamb mortality, litter size and ewe barrenness. Regardless of ewe genotype, as weight at joining increased the probability of rearing at least one lamb improved. To have a 0.9 probability (90% chance) of rearing at least one lamb Belclare, Suffolk x Belclare and $\geq 75\%$ Suffolk ewe lambs would need to be 48.5, 51.2 and 60.0 kg at joining respectively. Thus Belclare, Suffolk x Belclare and $\geq 75\%$ Suffolk ewes lambs would need to be 63%, 64% and 72% of mature body when joining at 9 months of age to have a 90% probability of rearing at least one lamb when lambing at 1 year of age.

Conclusions

- 1) Use of the 'ram effect' compacted the mating and thus lambing season resulting in 62% and 84% of lambing occurring within 2 and 3 weeks respectively.
- 2) Ewes were of a similar weight at 15 months of age regardless of been joined or not.
- 3) Lambing ewes to produce their first litter at 1 year of age had no effect on performance when lambing at 2 years of age.
- 4) Compared to the $\geq 75\%$ Suffolk ewes, Belclare ewes reared 0.37 and 0.29 more lambs when lambing at 1 and 2 years respectively. This increase in productivity is equivalent to approximately €65 per ewe joined, up 28 months of age.
- 5) Breeding ewe lambs provides an opportunity to reduce replacement cost
- 6) This study is on-going and ewes exit because either they die or are culled.

Table 1. Timetable for use of the “ram effect”

Day	
1	Introduce aproned rams
3	Remove aproned rams
14	Introduce fertile rams
18	1 st peak in matings
23	2 nd peak in matings

Table 2. Effect of age at first joining on ewe weight

Age (months)	Age at first joining (months)	
	7	19
8 (post joining)	51.9	51.1
11 (mid-pregnancy)	48.7	44.4
15 (weaning)	55.2	55.6
19 (joining)	59.8	61.8
24 (lambing)	64.5	62.3
27 (weaning)	65.2	64.7

(Source: Keady and Hanrahan 2016a, 2016b)

Table 3. Effect of age at first joining on ewe performance when lambing at 2 years of age

	Age at first joining (months)	
	7	19
Litter size	1.78	1.79
Lambs reared per ewe joined	1.41	1.38
Lamb birth weight (kg)	4.82	4.52
Lamb weaning weight (kg)	30.4	30.1
Ewes joined at 31 month (%)	83	80

(Source: Keady and Hanrahan 2016b)

Table 4. Effect of ewe genotype on performance when lambing at 1 year of age

	Genotype		
	Belclare	Suffolk x Belclare	Suffolk
Litter size	1.65	1.41	1.26
No reared/ewe joined	1.19	1.05	0.82

(Source: Keady and Hanrahan 2016a)

Table 5. Effect of ewe genotype on performance when lambing at 2 years of age

	Genotype		
	Belclare	Suffolk x Belclare	Suffolk
Litter size	1.9	1.84	1.60
No reared/ewe joined	1.50	1.49	1.21
Ewes joined at 31 months (%)	84	81	80

(Source: Keady and Hanrahan 2016b)

Figure 1. Effect of body weight at joining on the probability of rearing at least one lamb.

