Breeding from ewe lambs – factors affecting performance

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Breeding ewe lambs, provided that they are managed to meet their nutritional requirements, reduces the cost of rearing replacements and increases flock output and profitability. A major study was initiated recently at Athenry with the objective of evaluating the effects of age at first lambing (1 or 2 years) and ewe genotype [>75% Suffolk, Suffolk x Belclare, purebred Belclare] on the lifetime performance of ewes. This study will last until the ewes are culled for natural reasons. The different ewe genotypes were included in this study to evaluate the effect of prolificacy and age at first lambing on age at culling, replacement rate and lifetime output.

Ewe lamb mating management

Evidence suggests that it would take a 35 day joining period for first mating to be achieved by 90 % of a ewe lamb flock. As ewe lambs have a lower pregnancy rate per oestrus than mature ewes, only 70 % (approximately) of the animals would be pregnant after a 35 day joining period. 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. 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 due to the impact of pheromones released by sexually mature rams on ewes that are not yet cycling. An apron can be used on the ram to prevent mating if any ewe is already cycling. The 'ram effect' will also compact both the mating season and the subsequent lambing season.

The "ram effect" is illustrated in Table 1. Upon introduction of adult rams most ewes that are not already cycling will have a 'silent heat' (i.e., ovulation without oestrus) within 36 hours and a proportion will have a second silent heat after 6 days. These 'silent heats' are not detected by rams. The rams can be removed after 24 to 48 hours. Ewes will cycle at approximately 17 days after the final silent heat. Consequently there are 2 peak times for the number of ewes showing heat, namely 18 and 23 days after exposure to the rams. Consequently 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 variation in cycle length and to pick up any individuals that were already cyclic at the time of ram introduction.

Table 1. Timetable for use of the "ram effect"

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

At Athenry the "ram effect" was used on the ewe lamb flock. All ewe lambs were mated during the breeding season and the lambing season was compact, with 75 and 90 % lambing within 2 and 3 weeks, respectively. This clearly illustrates that the "ram effect" synchronises lambing. When using the "ram effect" to synchronise the mating season it is essential to have an adequate number of rams for mating (1 ram per about 18 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. Ideally, ewe lambs should be mated so that they lamb during the second half of the lambing

period of the adult flock to facilitate cross fostering etc., and also to avoid an extended lambing season.

Ewe lambs should be mated in a separate flock from mature ewes. Why? Ewe lambs are less likely than mature ewes to seek the ram when in heat and have a shorter oestrus; consequently there could be a high barren rate if ewe lambs have to compete with adult ewes for the attention of the rams.

Management during pregnancy

Unlike mature ewes, ewe lambs during early and mid pregnancy require a plane of nutrition that sustains a live weight gain (excluding foetal weight) of approximately 80 g/day. This is required to enable ewe lambs reach their normal mature body size. Consequently, ewe lambs need to have access to high feed value pasture from joining to housing, and require high feed-value silage supplemented with concentrate after housing. The level of concentrate supplementation depends on silage feed value and expected litter size.

Energy is normally the first limiting component in the diet of pregnant ewe lambs. When formulating a ration for ewe lambs it is essential to make allowances for requirements for maintenance, live-weight gain, wool growth, stage of pregnancy and expected litter size (as determined by ultrasound scanning). As a general rule, a pregnant ewe lamb requires an extra 2.5 megajoules of ME (metabolizable energy) relative to adult ewes of similar live weight at the same stage of pregnancy and carrying the same litter size. The additional energy allowance is to facilitate body weight gain.

At Athenry the ewe lambs (most mated in late October/early November) were housed in mid-December, shorn and offered high feed value grass silage (75 % DMD) as the sole diet. In mid-January the pregnant ewe lambs received 200 g of concentrate daily. Concentrate allowance was increased to 250 g/day in late January. Following pregnancy scanning (late January) the ewe lambs were penned according to expected litter size and lambing date. Ewe lambs carrying triplets had their concentrate allowance increased to 300 g/day in mid-February. During the last 6 weeks of pregnancy (mean lambing date late March) ewes carrying singles, twins and triplets received a total of 18, 26 and 33 kg concentrate/head.

If the quality of the silage available is poorer than that used at Athenry then increased concentrate supplementation would be required from housing to lambing.

Reproductive performance

The effects of ewe genotype on litter size and lamb viability are presented in Table 2. Ewe genotype had a major effect on litter size (difference of 0.39 lambs) and number of lambs reared per ewe lambing (0.31 lambs). Whilst the Belclare ewe lambs reared 1.32 lambs per ewe lambing their weaning rate was 1.19 lambs per ewe joined. The national average weaning rate for lowland mature ewes in Ireland is 1.2, consequently the performance of the Belclare ewe lambs was close to that achieved from the lowland flock in Ireland. Mean lamb mortality to weaning was 17%. It is of interest to note that the weight of ewe lambs had a significant effect on productivity. For example ewes that lambed but failed to rear a lamb were, on average, approximately 7 kg lighter at lambing than those that reared at least 1 lamb.

Table 2. Effect of ewe genotype on litter size and lamb mortality

	Genotype		
	Belclare	Belclare x Suffolk	Suffolk
Litter size	1.65	1.39	1.27
No reared/ewe lambing	1.32	1.03	0.93
Lamb mortality (%)	17.2	15.4	19.8

Lamb performance

The effect ewe genotype on lamb performance is presented in Table 3. Ewe lambs rearing twins were treated the same as mature ewes rearing triplets, i.e., they were managed in a separate flock and had access to 0.5 kg concentrate daily for 5 weeks post lambing, whilst their lambs had access to up to 300 g concentrate daily. All lambs had access to up to 300 g concentrate daily from 5 weeks of age until weaning at 14 weeks. Concentrate supplementation ceased at weaning. Lambs from Belclare ewes were on average 2.0 kg lighter than lambs from the >75% Suffolk ewes. However the Belclare ewes weaned 33 % more lamb live weight (due to their larger litter size) per ewe lambing than the >75% Suffolk ewes. Lamb daily live weight gain was 255, 279 and 269 g/day for lambs from the Belclare, Belclare x Suffolk and >75%Suffolk, respectively.

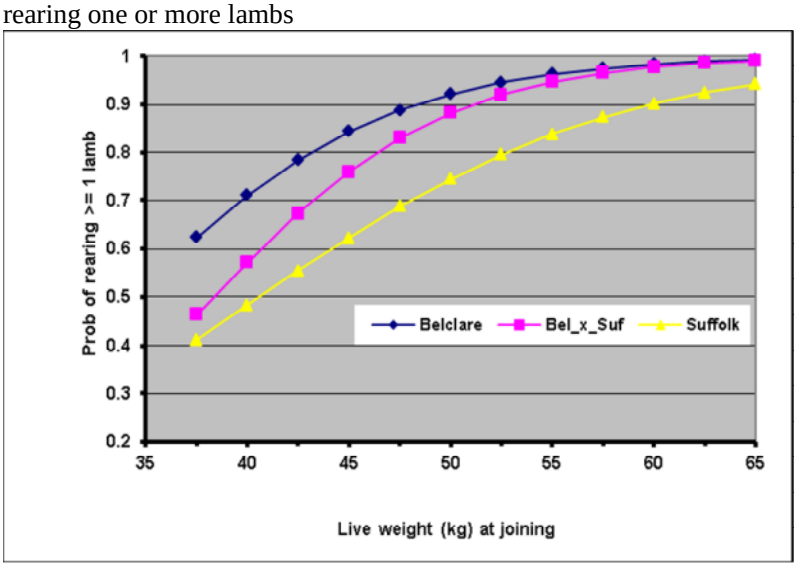
Table 3. Effect of dam breed and rearing type on lamb performance

		Genotype		
		Belclare	Belclare x Suffolk	>75% Suffolk
Weight (kg)	- birth	4.2	4.4	4.1
	- weaning	29.0	31.9	31.0
Weight gain (g/day)		255	279	269

Effect of joining weight of ewe lambs on productivity

Ewe lamb weight at joining influences date of puberty, fertility and pregnancy rate. The effect of live weight of ewe lambs at joining on the probability of rearing at least one live lamb is presented in Figure 1. The data presented in Figure 1 take into consideration fertility, litter size, ewe mortality and lamb mortality to weaning. The data presented clearly illustrate that increasing live weight at joining increases the probability of rearing a live lamb, but that appropriate live weight is influenced by ewe genotype. For example to have a 90% chance of rearing a live lamb, the Belclare and >75%-Suffolk ewe lambs would need to be 46 and 60 kg at joining, respectively. This clearly shows that whilst the weight of ewe lambs at joining is important, it is linked to genotype.

Figure 1. Effect of joining weight of ewe lambs from 3 different genotypes on the probability of rearing one or more lambs



Effect of age at first joining on the performance of ewes lambing as 2 years of age

Whilst this study is in its infancy half of the ewes in the flock are now 2.5 years of age. Therefore these ewes have lambed at 2 years of age, half of which were joined as ewe lambs. The effects of age at first joining on the performance as 2 year old ewes are presented in Table 4. Age at first joining had no effect on litter size or the number of lambs reared by 2 year old ewes. However, the lambs from 2 year old ewes that were joined as ewe lambs were 2 kg heavier than lambs from 2 year old ewes which were joined for the first time as hoggets. These results show that animals joined as ewe lambs were better mothers when lambing at 2 years of age. The mean weaning rate for 2 tooth Belclare, Belclare x Suffolk and >75% Suffolk ewes was 1.69, 1.51 and 1.32 lambs per ewe joined respectively. Therefore weaning rate differed by 0.37 lambs/ ewe joined due to ewe genotype.

Table 4. Effect of ewe age at first joining on the performance of 2 tooth ewes.

	Age at first joining (months)	
	7	19
Litter size	1.76	1.81
No reared/ewe lambing	1.40	1.46
Lamb weaning weight (kg)	31.4	29.4

Conclusions

1. Ensure lambs are approximately 60 % of mature weight at joining. For the > 75% Suffolk-cross and Belclare lambs 60% mature weight is 50 kg and 46kg, respectively.
2. Use of the “ram effect” can induce cyclicity and will compact mating, and subsequently compacts the lambing season.
3. Breeding from ewe lambs can yield a high level of productivity (weaning rate) that is close to that recorded for the national lowland adult ewe flock.
4. Feed ewe lambs to gain live weight throughout pregnancy.
5. Manage ewe lambs rearing twins the same as mature ewes rearing triplets.
6. Ewe genotype has a big impact on litter size, the number of lambs reared and the weight of lamb weaned.
7. Preliminary results show that mating ewe lambs does not impact negatively on reproductive performance at 2 years of age - rather it increases the weight of their progeny at weaning by 2 kg.