Breeding ewe replacements to lamb at 1 year of age - effect of ewe genotype and weight at joining

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Introduction

- **Breeding from ewe lambs**
  - **reduces cost of rearing replacements**
  - **increases flock output**
  - **can increase rate of genetic gain**
- **Age at first lambing and genotype influence lifetime output of lamb carcass by ewes**
- **Proportion of ewe lambs that attain puberty by end of joining period is influenced by**
  - **genotype**
  - **weight at joining**
  - **date and duration of joining**

Aims

- **To evaluate the effects of**
  - **ewe genotype**
  - **weight at joining**

on the performance of

- **ewe lambs joined to lamb at 1 year**
- **and of their progeny**

Experimental - 1

- **230 ewe lambs**

Genotype	Number	Weight range (kg)	Mean weight (kg)
Belclare	84	36.5 – 55.0	45.3
B x Suffolk (S)	65	37.9 – 55.6	46.1
>75% S	81	41.9 – 59.0	48.3

- **Exposed to vasectomised rams for 48 h at day 14 prior to joining to advance first oestrus– “ram effect”**
- **Joined with Charollais rams**
- **Joining period: 42 days**

Experimental - 2

- **Shorn at housing and offered high feed-value grass silage**
- **Concentrate supplementation – pre lambing**
  - **200 g/d from 14 to 27 Jan**
  - **250 g/d from 28 Jan → 6 wks prior to lambing**

  plus

  - **18, 26 and 33 kg to single, twin and triplet bearing ewes during the final 6 weeks of gestation**
- **Concentrate supplementation - post lambing**
  - **twin rearing ewes 0.5 kg/d for 5 wks**
  - **lambs: - singles up to 300 g/d from wks 5 to 14**
    - **twins up to 300 g/d from birth to 14 wks**
- **Weaned at 14 weeks and concentrate withdrawn**

Assessments

Ewe
- **live weight**
- **condition score**
- **lambing details and weights**

Lamb
- **live weight**
- **age at slaughter**
- **carcass details**

Silage feed value

Dry matter (DM; g/kg)	**212**
pH	**3.9**
Crude protein (g/kg DM)	**127**
Ammonia N (g/kg N)	**60**
DMD (g/kg)	**765**
ME (MJ/kg DM)	**11.7**

Effect of genotype on ewe weight

		Genotype			s.e.	sig
		Belclare	Bel x Suff	> 75% Suff		
Weight (kg)	- post joining	49.8^{a}	50.7^{a}	53.9^{b}	0.40	***
	- Mar/April	46.6^{a}	48.1^{ab}	49.1^{b}	0.53	**
	- July	54.2^{a}	55.5^{ab}	56.6^{b}	0.49	**

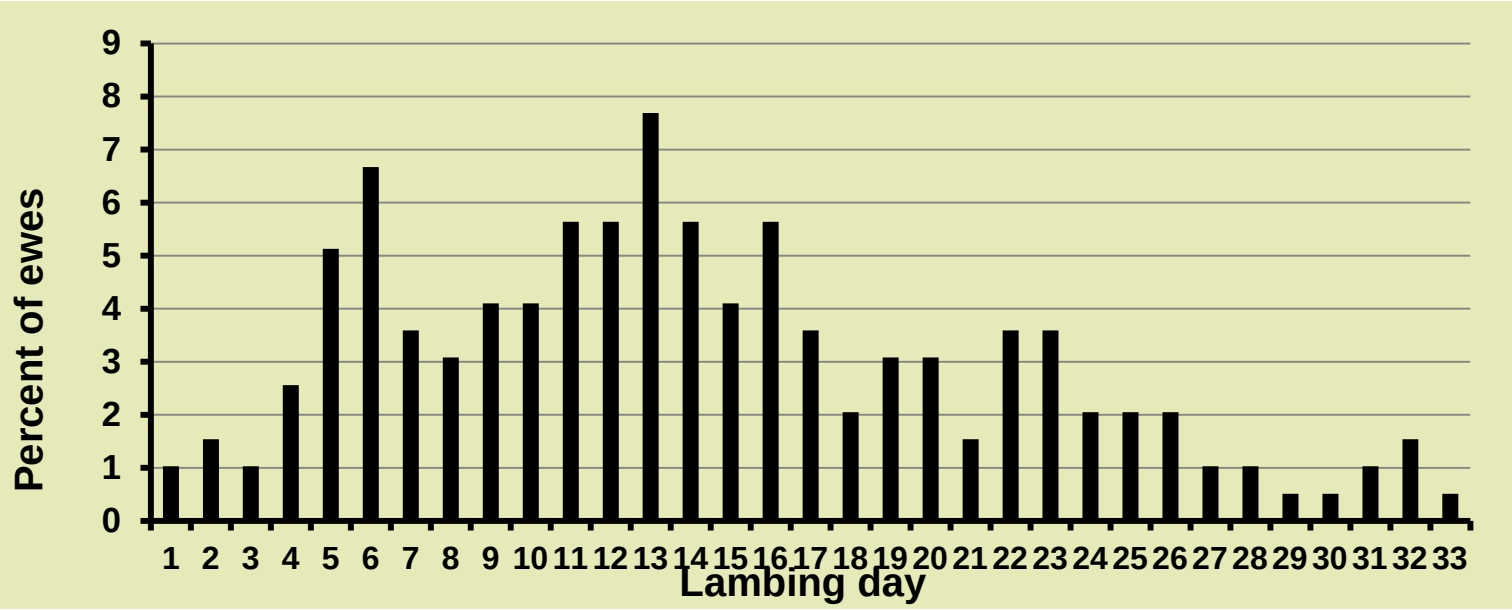
Effect of genotype on litter size and number reared

	Genotype				
	Belclare	Bel x Suff	> 75% Suff	s.e.	sig
Litter size	1.65[a]	1.41[b]	1.26[b]	0.066	***
Lambs weaned per ewe					
- lambing	1.32[a]	1.19[ab]	1.01[b]	0.076	**
- joined	1.19[a]	1.05[ab]	0.82[b]	0.081	**

Effect of genotype assistance at lambing and lamb mortality

	Genotype			
	Belclare	Bel x Suff	> 75% Suff	sig
Failed to lamb (%)	13.2	13.6	18.7	NS
Assisted at lambing (%)	53.1	46.8	70.6	NS
Lamb mortality (%)				
- dead born	11.8	9.4	10.1	NS
- total	16.0	12.7	18.8	NS

Distribution of lambing



- **62%** of lambings occurred in **14 days**
- **84%** of lambings occurred in **21 days**

Effect of ewe genotype on lamb performance

	Genotype			s.e.	sig
	Belclare	Bel x Suff	> 75% Suff		
Lamb weight (kg)					
- birth	4.2	4.4	4.4	0.11	NS
- weaning	29.0^{a}	31.9^{b}	31.0^{b}	0.54	***
Lamb gain (g/day)					
- birth to 5 weeks	266	283	262	7.8	NS
- birth to weaning	255^{a}	279^{b}	269^{ab}	5.0	**
- birth to slaughter	210^{a}	228^{b}	221^{b}	4.8	*

Effect of ewe genotype on lamb performance

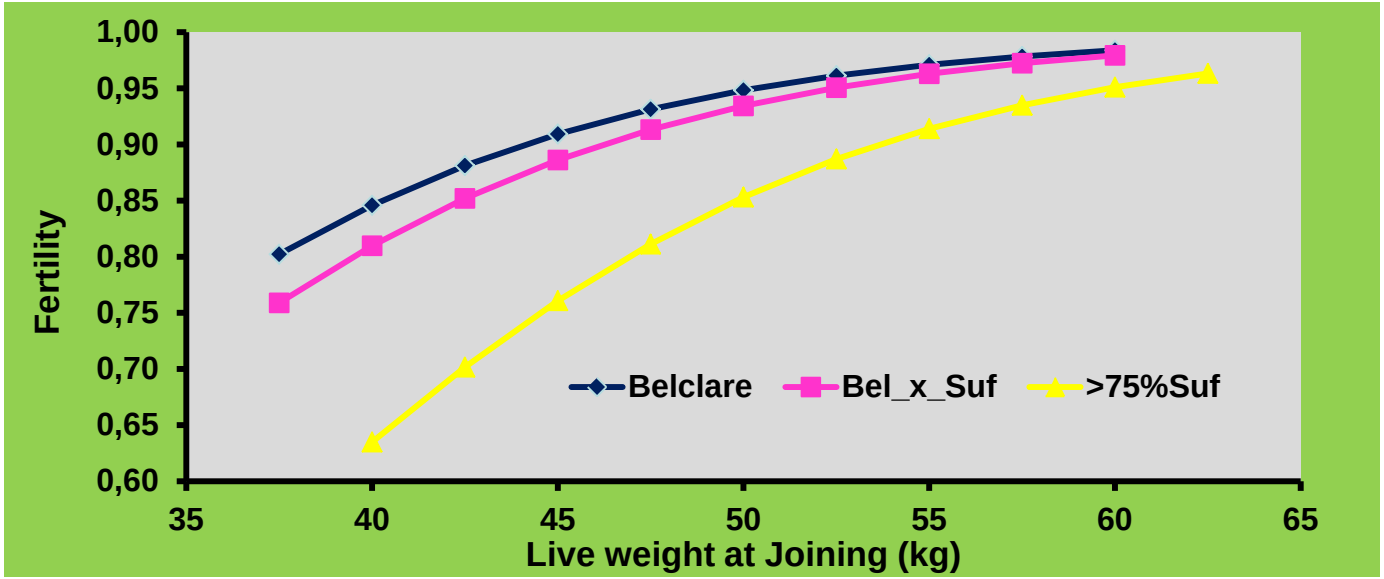
	Genotype			s.e.	sig
	Belclare	Bel x Suff	> 75% Suff		
Weight at slaughter (kg)	46.2	46.9	47.4	0.46	NS
Carcass weight[1] (kg)	20.4	20.6	20.5	0.20	NS
Carcass fat score[2]	2.9	2.9	2.9	0.06	NS
Dressing proportion (g/kg)	438	437	431	2.8	NS
Age at slaughter[1] (days)	207[a]	190[b]	201[ab]	4.0	**

[1]at fat score = 3; [2] at constant carcass weight

Effect of genotype on ewe performance at 18 months

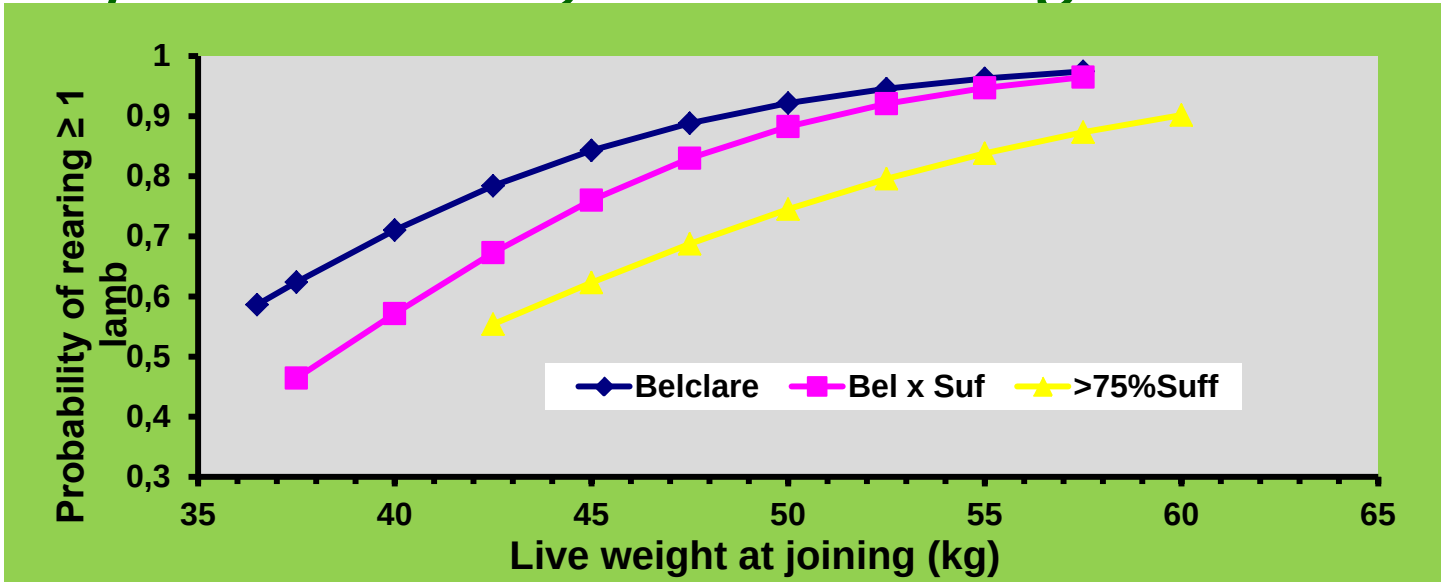
	Genotype				
	Belclare	Bel x Suff	> 75% Suff	s.e.	sig
Body weight (kg)	59.3[a]	61.2[b]	62.0[b]	0.51	***
Body condition score	3.36[a]	3.34[a]	3.75[b]	0.20	***
Survival to 18 months (%)	94.7	94.4	95.1	-	NS

Effect of weight at joining on ewe fertility



- Weight at joining had a significant effect (*P < 0.02*)
- Breed differences - Belclare v >75%Suf (*P < 0.05*)
  - Bel x Suff v >75% Suff (*P=0.09*)

Effect of weight at joining on the probability of rearing a lamb



- Significant interaction between ewe genotype and joining weight ($P < 0.01$)
- Ewes that failed to rear a lamb were 5.0 kg lighter at joining ($P < 0.01$)

Effect of joining on ewe performance at 18 months

	Joined			
	Yes	No	s.e.	sig
Body weight (kg)	59.8[a]	61.8[b]	0.42	***
Body condition score	3.49	3.48	0.16	NS
Survival to 18 months (%)	95.2	94.3	-	NS

Conclusions

- **Ewe lambs in weight range (50 to 70% of mature weight) were used in the current study**
- **Use of the “ram effect” resulted in**
  - **100% of ewe lambs being mated**
  - **90% of lambings within a 21-day period**
- **Belclare ewe lambs weaned 1.19 lambs per ewe joined, which is close to that recorded for lowland flocks**
- **Relative to >75% Suff ewes Belclare**
  - **weaned an extra 0.37 lambs**
  - **weaned 36% more lamb LW**
  - **progeny 6 days older at slaughter**
  - **were lighter at 18 months**

Conclusions

- **Relative to >75% Suff ewes Belclare X Suffolk**
  - **weaned an extra 0.23 lambs**
  - **weaned 32% more lamb LW**
  - **progeny 11 days younger at slaughter**
  - **similar LW at 18 months**
- **Genotype had no effect on ewe survival at 18 months**
- **Joining had no effect on ewe BCS at, and survival to, 18 months**
- **Weight at joining and lambing influenced ewe productivity**
- **To have a 90% chance of rearing at least 1 lamb Belclare, Bel x Suff and >75% Suffolk ewe lambs need to be 48.5 (63%), 51.2 and 60.0 (72%) kg at joining**

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Effect of joining on ewe weight

		Joined			
		Yes	No	s.e.	Sig[1]
Weight (kg)	- post joining	51.9	51.1	0.31	NS
	- Mar/April	54.7[a]	41.2[b]	0.43	***
	- July	55.2	55.6	0.40	NS

[1] There were no genotype by joining interactions (P > 0.05)