

Effects of age at first joining and genotype on ewe performance from 2 to 8 years of age

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Introduction

- Replacement rate in Irish lowland sheep flocks is 22% (NFS)
- Ewe productivity: ~1.3 lambs weaned/ewe joined for last ~40 years
- Replacements cost ~25% of lifetime lamb-carcass value (Keady 2014)
- Reduce costs by increasing number of lambs per ewe lifetime:
 - by lambing at 1 year
 - using prolific ewe genotypes
- 66% of lowland ewes sired by 2 terminal sire breeds - low productivity
- 9.5% of lowland ewes from Belclare sires: + 0.21 lambs/ewe joined relative to crossbred ewes from Suffolk sires (Hanrahan 2001)

Objective

- To evaluate the effect of
 - first-joining age (~7 or 19 months)
 - genotypeon ewe performance from 19 months until aged 8 years

Experimental -1

- 424 ewes joined - 157 Belclare (B)
 - 114 Suffolk × B (SxB)
 - 153 '≥75%' Suffolk (S)
- 50% of each genetic group had been joined at ~ 7 months
 - remainder joined for the first time at ~ 19 months
- Ewes only left the flock when either:
 - culled for health/welfare reasons (e.g., udder or mouth issues)
 - died
- Synchronised using progesterone impregnated sponges
- Joined with Charollais rams at ~36 h and 16 days after sponge removal

Experimental - 2

- Shorn at housing
- Offered high feed-value grass silage
- Conc. supplementation depended on litter size and silage feed value
- Ewes lambed indoors; then post lambing
 - single and twin rearing ewes plus lambs → no concentrate
 - triplet rearing ewes → 0.5 kg/d for 5 weeks
→ lambs up to 300 g/d to weaning
- Managed in a grass-based system – rotational grazing
- Weaned at 14 weeks and concentrate withdrawn
- Post weaning → all lambs as one flock until slaughter
- All lambs slaughtered prior to the end of the grazing season



Effect of first joining age on ewe weight and BCS from 2 to 8 years

		First joining age		s.e.	sig
		7 months	19 months		
BW (kg)	- pre joining	76.9	75.7	0.50	NS
	- lambing	76.4	74.9	0.60	NS
	- weaning	75.8	74.5	0.61	NS
BCS	- pre joining	3.5	3.5	0.02	NS
	- lambing	3.1	3.1	0.03	NS
	- weaning	3.2 ^a	3.1 ^b	0.03	*

Effect of first joining age on reproductive performance from 2 to 8 years

	First joining age		s.e.	sig
	7 months	19 months		
Litter size	1.95	1.95	0.035	NS
Lambs reared/ewe joined	1.57	1.52	0.038	NS
Assisted at lambing (%)	30.1 ^a	37.3 ^b	1.37	*
Barren (%)	8.9	7.8	1.31	NS
Lamb mortality (%)	6.7 ^a	9.2 ^b	-	*
No. of joinings	3.9	3.7	0.13	NS
No. of lambs reared	6.2	5.7	0.26	NS



Effect of first joining age on lamb performance from 2 to 8 years

		First joining age		s.e.	sig
		7 months	19 months		
Weight (kg)	- birth	5.2 ^a	5.0 ^b	0.05	*
	- weaning	33.4	33.2	0.27	NS
BW gain birth to weaning (g/day)		289	289	2.5	NS
Slaughter weight (kg)		48.8	48.9	0.13	NS
Carcass weight (kg)		21.5	21.4	0.07	NS
Age at slaughter (days)		176	177	1.9	NS

Effect of ewe genotype on weight and BCS from 2 to 8 years

		Ewe genotype			s.e.	sig
		Bel	Bel×Suff	≥75%Suff		
BW (kg)	- pre joining	77.3 ^a	79.6 ^b	79.4 ^b	0.72	*
	- lambing	73.8 ^a	76.7 ^b	76.6 ^b	0.73	**
	- weaning	74.4	75.4	75.6	0.74	NS
BCS	- pre joining	3.5	3.5	3.5	0.03	NS
	- lambing	3.0	3.1	3.1	0.04	NS
	- weaning	3.1	3.2	3.2	0.04	NS

Effect of ewe genotype on reproductive performance from 2 to 8 years

	Ewe genotype			s.e.	sig
	Bel	Bel×Suff	≥75%Suff		
Litter size	2.02 ^a	2.09 ^a	1.76 ^b	0.047	***
Lambs reared/ewe joined	1.62 ^a	1.69 ^a	1.33 ^b	0.054	***
Assisted at lambing (%)	30.3	34.0	36.7	-	NS
Barren (%)	8.9 ^{ab}	5.8 ^a	11.1 ^b	1.62	*
Lamb mortality (%)	6.1 ^a	6.8 ^{ab}	11.3 ^b	-	NS
No. of joinings	3.6	4.0	3.8	0.16	NS
No. of lambs reared	5.9 ^a	6.6 ^a	5.2 ^b	0.32	*

Effect of ewe genotype on lamb performance from 2 to 8 years

		Ewe genotype			s.e.	sig
		Bel	Bel×Suff	≥75%Suff		
Weight (kg)	- birth	4.9 ^a	5.2 ^b	5.1 ^{ab}	0.06	*
	- weaning	33.0 ^a	34.1 ^b	32.8 ^a	0.31	**
BW gain birth to wean (g/d)		287 ^a	296 ^b	283 ^a	2.9	**
Slaughter weight (kg)		48.9	48.6	49.0	0.16	NS
Carcass weight (kg)		21.5	21.4	21.5	0.08	NS
Age at slaughter (days)		177 ^{ab}	172 ^a	181 ^b	2.2	**

Effect of age at first joining (F) and ewe genotype (G) on lifetime number of lambs reared

		Ewe genotype			G	FJ	GxFJ
		Bel	Bel×Suff	≥75%Suff			
First joining	- 7 months	6.7	7.0	5.9	*	***	NS
	- 19 months	5.2	6.1	4.5			

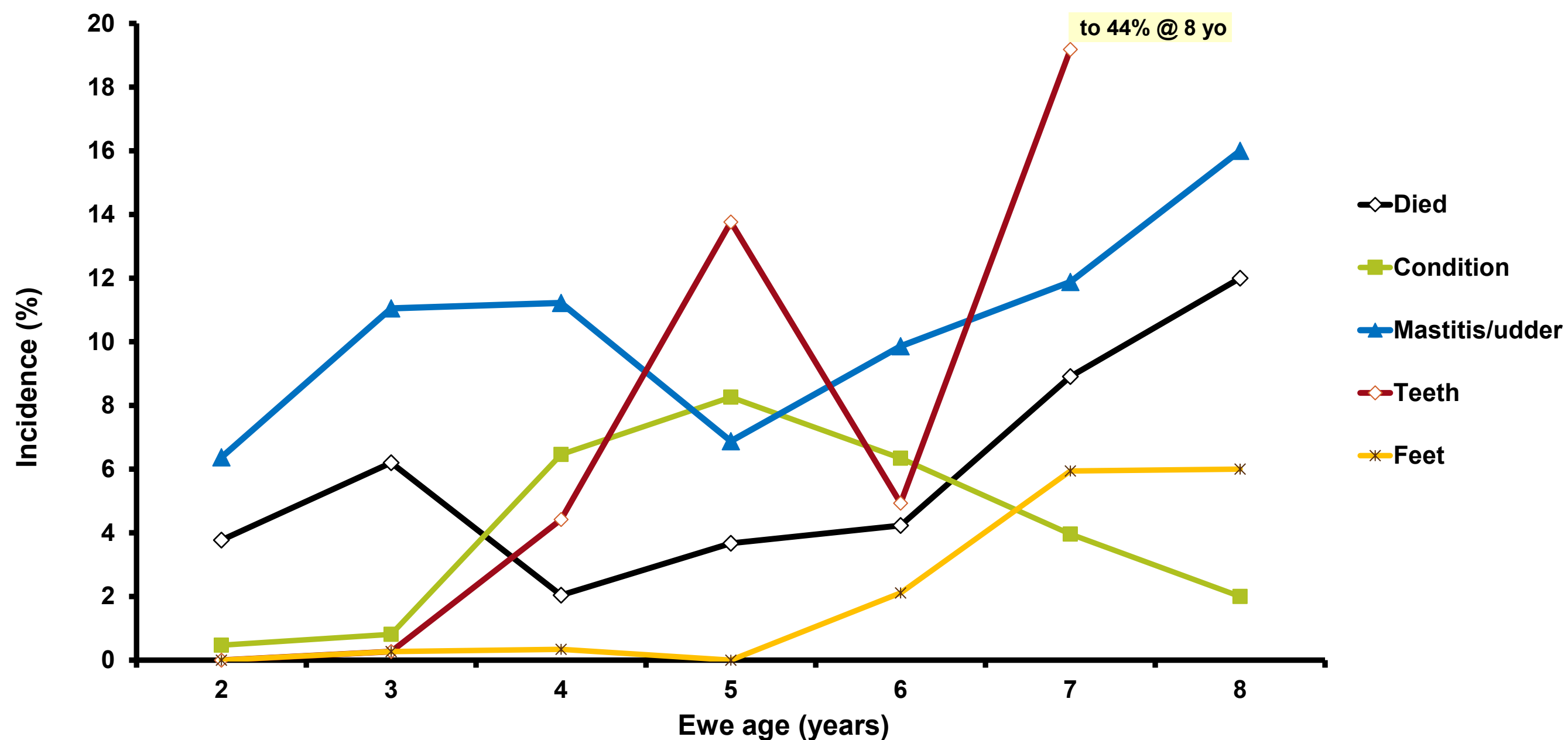
**B and BxS joined at 7 months reared
52% more lambs than ≥75% S joined at 19 months**

Reasons for exit the flock

Reason for exiting	% of ewes joined
Died	18.2
Mastitis/udder	35.8
Condition	15.8
Teeth	19.8
Feet	3.3
Prolapse	2.6
Miscellaneous	4.5



Reason for 'flock Exit' - by ewe age



Conclusions

- Flock was managed as a grass-based system of prime lamb production, using 3 ewe genotypes and 2 ages at first lambing
 - ewes could remain in the flock for up to 8 years
- From 2 to 8 years of age
 - first joining age had no effect on output per ewe or reason for culling
 - first joining at 7 months reduced lamb mortality and lambing difficulty
 - genotype had a big effect on annual lamb output (0.36 lambs/ewe)
 - mastitis/udder was the main reason for culling followed by teeth, death and poor condition
- Changing ewe genotype and age at first joining has big impact on flock output:
 - during their lifetime B and BxS ewes joined at 7 months reared 52% more lambs than $\geq 75\%$ S ewes joined at 19 months



