Hogget lambing and its effect on the subsequent two-tooth performance of three breeds

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ABSTRACT

Matched groups of ewe hoggets were mated to either fertile Southdown rams or vasectomised rams for a 6-week period in 1980 and 1981. The percentages of Romney, Coopworth and Perendale hoggets born in 1979 showing oestrus were 82, 92 and 92, and for those born in 1980 47, 84 and 79 respectively. The lower incidence of oestrus in those born on 1980 can be partly explained by lower hogget pre-lambing weights related to an outbreak of facial eczema in April 1981. Of hoggets joined to fertile rams, the percentages that weaned a lamb were 47, 60 and 67 for those born in 1979, and 13, 53 and 52 for those born in 1980.

The percentages of two-tooths joined that weaned a lamb (average for those born in 1979 and 1980) were 71 for those not tupped as hoggets, 74 for those tupped by vasectomised rams, 53 for those tupped by fertile rams but not lambing, and 76 for those lambing as hoggets. There was no suggestion that hogget lambing impaired two-tooth reproduction, but those lambing produced 0.15 kg less wool at the two-tooth pre-mating shearing.

The April 1981 GGT level of the 1980-born ewes was inversely related to live weight in April through to September 1981, and to the percentage of ewes lambing as hoggets and as two-tooths, and to two-tooth pre-mating fleece weight.

INTRODUCTION

The scientific literature indicates that lambing ewes in their first year of life does not impair their subsequent reproduction (Dyrmundsson, 1973 review). The practice should therefore lead to lifetime advantages in terms of lambs weaned per ewe. However many New Zealand farmers are sceptical of the advantages of the practice (Knight *et al.*, 1982). In order to make an impact on the economy, hogget lambing would have to be widely accepted by hill country farmers who would need to be convinced that a worthwhile percentage of hoggets will wean a lamb that can be grown to marketable size and there is no adverse effect on subsequent performance of the ewes. Therefore the present trial was initiated to investigate the feasibility of lambing Romney, Coopworth and Perendale hoggets in hill country and its subsequent effects on their production.

EXPERIMENTAL

This paper includes information on hogget and two-tooth production from 233 ewes born in 1979 and 296 in 1980. In both years the ewe lambs were grown with a target live weight of 30 kg in early April, when they were joined with harnessed vasectomised rams. Those born in 1980 failed to reach this target, partly due to a facial eczema outbreak in March-April 1981. These ewes were bled on 21 April 1981 and their serum gamma-glutamyltransferase (GGT) levels determined (Towers and Stratton, 1978). At the beginning of May in both years the ewes were divided into 2 groups within breeds, birth types and April live weight stratifications. One group was mated to fertile Southdown rams for a 6-week period while the other group continued with vasectomised rams. Tup marks were recorded at fortnightly intervals. The group mated to the fertile rams was half the 1979-born lambs and two-thirds of the 1980-born lambs. Following pregnancy diagnosis in late September the ewes were split into pregnant and non-pregnant groups. In both years the pregnant ewes were separated from this time until they weaned their lambs in mid-December at 5 to 11 weeks old. In 1980 there were no comparisons of the level of nutrition of the 2 groups of ewes during this period. In 1981 a marker group of dry hoggets run with the pregnant ewes gained 14.5 kg during the period of separation while a similar group with the non-pregnant ewes gained 12.9 kg. Half the male lambs produced by hoggets born in 1979 were castrated at an average age of 2 weeks; all these lambs were slaughtered on 11 March 1980 and carcass weight, C and GR measurements taken as described by Kirton *et al.* (1967). Half the

male lambs produced by hoggets born in 1980 were castrated on 16 November at an average age of 6 weeks. These lambs were all slaughtered on 3 February 1981 and the same carcass information was recorded.

All ewes were run together following the date of hogget weaning. In late March as two-tooths they were mated to rams of their own breed, and the number of lambs born and weaned by individual ewes was recorded.

All ewes were weighed at at least monthly intervals from birth until just before the hogget lambing, subsequently they were weighed at hogget weaning, before two-tooth shearing in February and before two-tooth mating in March, pre-lambing in August and at their two-tooth weaning.

All hoggets were shorn pre-lambing in September and again in February before the two-tooth mating.

RESULTS

Hogget Mating

The pre-mating weights and the percentages of hoggets tupped by fertile and vasectomised rams (ET/EP) were higher for all breeds for the 1979-born ewes than for the 1980-born ewes (Table 1). The April 1981 GGT levels had a significant effect on the percentage of hoggets tupped over and above pre-mating live weight ($P < 0.001$).

Hogget Lambing

In 1979 there were no effects of breed on the proportion of ewes lambing (EL/EJ), ewes weaning (EW/EJ), ewes lambing multiples (ELM/EL) or ewes weaning multiples (EWM/EW) (Table 2). The EL/EJ and EW/EJ ratios for the 1980-born ewes were significantly less for the Romney than the other 2 breeds (both $P < 0.001$).

Lambs Produced by Hoggets

There was no significant breed of dam or sex effect on hot carcass weight in either year, the means were 11.5 and 8.8 kg for those killed in March 1981 and February 1982 respectively. There was a significant breed of dam effect on the C measurement in those killed in March 1981 ($P < 0.05$); the Coopworth (1.6 mm) was greater than the Romney or Perendale (1.2 mm). The mean C measurement in February 1982 was 1.6 mm. There was a significant sex effect on the GR measurement (mm) in both years, ewes 5.6, 4.7; rams 4.3, 3.7; and wethers 5.3, 4.5 in 1981 ($P < 0.01$) and 1982 ($P < 0.05$).

TABLE 1 Hogget mating.

Breed	Year born	Total ewes joined (EP)	Pre-mating weight (kg) April	Pre-mating weight (kg) May	Pre-mating serum GGT (IU/l)	ET/EP[1] %
Romney	1979	72	33	35	—	82
	1980	93	27	29	312	47
Coopworth	1979	97	34	36	—	91
	1980	102	29	30	372	84
Perendale	1979	64	33	35	—	92
	1980	101	30	31	307	79

[1] Ewes tupped/total ewes joined to fertile and vasectomised rams.

TABLE 2 Hogget lambing.

Breed	Year born	Ewes joined to fertile rams (EJ)	EL/EJ[1] %	ELM/EL[2] %	EW/EJ[3] %	EWM/EW[4] %
Romney	1979	36	56	5	47	6
	1980	60	23	0	13	0
Coopworth	1979	48	75	17	60	14
	1980	66	59	5	53	3
Perendale	1979	30	77	4	67	0
	1980	65	66	2	52	0

[1] Ewes lambing/ewes joined to fertile rams.
[2] Ewes lambing multiples/ewes lambing.
[3] Ewes weaning/ewes joined to fertile rams.
[4] Ewes weaning multiples/ewes weaning a lamb.

Effect of Hogget Reproduction on Subsequent Performance

Hoggets were grouped in 4 reproduction classes; those that were not tupped, those that were tupped by vasectomised rams, those that were tupped by fertile rams but did not lamb, and those that lambed. The last group was significantly lighter than other tupped hoggets (Table 3) at the time the hogget lambs were weaned (mid-December) in both years. However this group was not lighter at the two-tooth mating (Table 3).

TABLE 3 Effect of hogget reproduction on subsequent performance.

Hogget reproduction class	n		Weight at hogget weaning (December) (kg)		Two-tooth live weight (March) (kg)		Pre-mating fleece weight (February) (kg)		Two-tooth performance EL/EJ %		ELM/EL %		EW/EJ %		EWM/EW %	
Year born	79	80	79	80	79	80	79	80	79	80	79	80	79	80	79	80
Not tupped	24	69	49	44	45	41	2.28	2.13	70	75	20	23	70	71	12	12
Tupped by vasectomised rams	80	64	53	46	48	43	2.32	2.04	79	78	32	33	75	72	24	25
Tupped by fertile rams																
barren	22	45	51	46	47	43	2.32	2.13	67	66	21	14	58	48	13	12
lambed	75	84	49	43	46	40	2.18	1.87	76	85	29	25	73	79	18	17
Significance			**	**	NS	NS	*	***	NS	*	NS	NS	NS	*	NS	NS

The two-tooth fleece weights of the hoggets that lambed were the lightest in both years (Table 3). There was also a significant effect of breed of ewe on this fleece weight (kg); for the 1979-born 2.60, 2.36 and 1.86 with s.e.d. 0.08; for the 1980-born 2.27, 2.13 and 1.73 with s.e.d. 0.05 for the Romney, Coopworth and Perendale respectively.

There were no significant effects of hogget reproduction class on EL/EJ, EW/EJ, ELM/EL or EWM/EW for the ewes born in 1979, but there were significant effects of hogget reproduction class on EL/EJ and EW/EJ for the ewes born in 1980 (Table 3).

The Effect of GGT on Subsequent Production (1980-born Ewes)

Regression coefficients (g decrease in live weight per April 1981 IU/l serum GGT) were calculated for monthly live weights from November 1980 till September 1981. The following coefficients were significant: April 2.4; May 2.9; June 3.5; July 3.4; August 3.6; and September 4.0, but they were not significant for November 1981 or March 1982 live weights.

There was a significant effect of GGT on hogget EL/EJ ($P < 0.05$) and two-tooth EL/EJ and EW/EJ (both $P < 0.01$). The expected percentages for hogget EL/EJ were 57, 50 and 14; for two-tooth EL/EJ 91, 86 and 79 and for two-tooth EW/EJ 82, 76 and 69 at GGT levels of 100, 300 and 500 IU/l respectively.

There was a decrease of 0.21 g of two-tooth fleece weight per IU/l increase in serum GGT ($P < 0.01$).

DISCUSSION

In this study weaning rates (EW/EJ) of over 50% were achieved from Coopworth and Perendale hoggets with pre-mating live weights averaging at least 30 kg, whereas a 35 kg pre-mating live weight for the Romney breed resulted in a 47% weaning rate and a 29 kg pre-mating live weight resulted in a 13% weaning rate.

While hogget lambing did affect the weight of the hogget at the date their lambs were weaned it had no effect on two-tooth pre-mating weight, in contrast with most other studies (Dyrmundsson, 1973; Baker *et al.*, 1981). This reflects the preferential treatment given to lambing hoggets in this study.

In both years those ewes that lambed as hoggets produced less wool at the two-tooth pre-mating shearing. This result is in agreement with numerous workers (Dyrmundsson, 1973; Baker *et al.*, 1981).

The significant effects of GGT on live weight were relatively short term, the effect had disappeared in December. Nevertheless, the effects of GGT were evident in both hogget and two-tooth reproduction. Though GGT did not affect two-tooth pre-mating weight, it still affected two-tooth EL/EJ and EW/EJ, for both ratios an increase of 200% IU/l serum GGT resulted in a decrease of about 6%. There were effects of GGT which could not be explained on the ground of live weight alone. A similar effect on the percentage of two-tooth ewes ovulating was shown by Smeaton *et al.*, 1982).

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