

New Zealand Society of Animal Production online archive

This paper is from the New Zealand Society for Animal Production online archive. NZSAP holds a regular annual conference in June or July each year for the presentation of technical and applied topics in animal production. NZSAP plays an important role as a forum fostering research in all areas of animal production including production systems, nutrition, meat science, animal welfare, wool science, animal breeding and genetics.

An invitation is extended to all those involved in the field of animal production to apply for membership of the New Zealand Society of Animal Production at our website www.nzsap.org.nz

[View All Proceedings](#)

[Next Conference](#)

[Join NZSAP](#)

The New Zealand Society of Animal Production in publishing the conference proceedings is engaged in disseminating information, not rendering professional advice or services. The views expressed herein do not necessarily represent the views of the New Zealand Society of Animal Production and the New Zealand Society of Animal Production expressly disclaims any form of liability with respect to anything done or omitted to be done in reliance upon the contents of these proceedings.

This work is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](http://creativecommons.org/licenses/by-nc-nd/4.0/).



You are free to:

Share— copy and redistribute the material in any medium or format

Under the following terms:

Attribution — You must give [appropriate credit](#), provide a link to the license, and [indicate if changes were made](#). You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

NonCommercial — You may not use the material for [commercial purposes](#).

NoDerivatives — If you [remix, transform, or build upon](#) the material, you may not distribute the modified material.

<http://creativecommons.org.nz/licences/licences-explained/>

EFFECT OF MATING ROMNEY EWE HOGGETS ON LIFETIME PRODUCTION — PRELIMINARY RESULTS

R. L. BAKER, J. N. CLARKE and G. D. DIPROSE

Ruakura Animal Research Station, Hamilton

SUMMARY

The effect of hogget lambing on subsequent performance is reported. Between 1971 and 1976, 504 hoggets were joined in groups balance for age, weight, birth rank and sire. On average 30% lambed (range between years, 10-57). Lambing hoggets averaged 1.09 lambs of which 72% survived to weaning. The effect on subsequent reproductive performance from two to four years of age was combined and summarised. While there was little difference in litter size, ewes lambing as hoggets exceeded those lambing first as two-tooths by 10% in lambs weaned/ewes joined. Two-tooth liveweight and fleece weight were adversely affected.

INTRODUCTION

From a comprehensive review of the literature, Dyrmondsson (1973) concluded that breeding from ewe hoggets can increase the reproductive life of a ewe and enhance lifetime productivity. Recently published reports from Norway (Baker, *et al.*, 1978; Steine, 1979) and U.S.A. (Hohenboken, *et al.*, 1977; Levine, *et al.*, 1978) support this finding.

Little published information from trials in N.Z. on this subject is at present available. Ch'ang and Raeside (1957) presented N.Z. data on the breeding season of Romney ewe hoggets and suggested that selection of two-tooth replacement ewes from those that experienced oestrus as ewe hoggets may improve subsequent lifetime fertility. Ch'ang and Rae (1970) and Baker, *et al.*, (1979) obtained heritability estimates for oestrus activity (number of hogget matings) in Romney ewe lambs of about 0.30. There is now general agreement from both New Zealand (Ch'ang and Rae, 1972; Hight and Jury, 1976; Clarke, 1980; Baker, *et al.*, unpublished; Moore and Smeaton, 1980) and U.S.A. studies (Hulet, *et al.*, 1969; Levine, *et al.*, 1978) of a small positive association of ewe hogget oestrus activity and subsequent lamb production. The results of Ch'ang and Rae (1972) would suggest a strong genetic basis to this positive phenotypic correlation, but our own unpublished data from the Waikite research flock does not support this conclusion.

The only published reports on mating and lambing of ewe hoggets in New Zealand are those of Apps (1953) and Lewis (1959). While

the latter study was of adequate size and experimental design to investigate the relationship between lambing performance at one year of age and subsequent lifetime productivity, no further results were published. These reports showed that under favourable feeding and management conditions 50-60% of lambs could be weaned from Romney ewe hoggets.

The aim of the present study was to examine under North Island hill country conditions, the effects of hogget joining on total lifetime lamb production and to evaluate hogget mating and lambing performance as early predictors of subsequent lifetime lamb production and of breeding value for lamb production. The effect of hogget lambing on subsequent performance will be reported here.

MATERIALS AND METHODS

From 1972 to 1977 Romney ewe hoggets from two of the experimental lines at the Waikite Lands and Survey Block near Rotorua were randomised into two groups within age, weight, birth rank and sire group classifications. One group was joined as hoggets. The balance was held over and mated as two-tooths (controls). The two experimental lines involved in this study were a closed random-bred control line and a progeny test line comparing sires from the Ruakura High Fertility flock and the Waihora group breeding scheme (Clarke, 1978). In both cases any selection of ewe replacements to enter these flocks as two-tooths was at random within sire progeny groups. Over this period joining dates for the main ewe flock were late March or early April, and rams were removed about 42 days later. The rams were joined with the ewe hoggets about mid-April (10-19 April) and removed about 36 days later.

RESULTS AND DISCUSSION

A total of 504 hoggets were joined and survived to produce a lambing result. On average, while 75% of these ewe hoggets cycled at least once (range among years 64-94%), only 30% lambed (range among years 10-57%). For those which lambed, the average number of lambs born was 1.09, of which 72% survived to weaning. This resulted in an average weaning rate (lambs weaned/hogget joined) of 24% (range among years 7-50%). This is comparable with the results from 15 731 hoggets joined at Waihora between 1973 and 1977 (McCall and Hight, 1981), where the average weaning rate

TABLE 1: ASPECTS OF LIFETIME REPRODUCTIVE PERFORMANCE (WEIGHTS IN kg)

Item	Experimental Group			Sire Source		
	Mated and lambled as hoggets	Mated as hoggets no lambs	Controls mated as 2-tooths	Waikite	Waihora	Ruakura HF
No. lambing as 2-tooths	77	168	185	318	51	61
Total joinings	179	403	456	726	149	163
Hogget yearling weight	41.8	39.7	38.2	38.6	41.4	41.3
Pre-tupping weight, 2-tooth	47.7	50.9	50.7	47.2	51.5	53.4
Pre-tupping weight, 4 and 6-tooth	54.2	55.4	53.9	54.3	53.0	56.3
EL/EJ (%) ^b	91	90	91	91	89	91
LB/EL (%) ^b	143	137	145	135	146	149
LW/LB (%) ^b	88	85	80	84	81	88
LW/EJ (%) ^b	115	105	105	103	105	119
Weaning weight ^b	21.6	19.1	19.2	19.0	19.4	22.4
Weight of lamb weaned ^b	24.8	20.1	20.4	19.6	20.4	26.7
Hogget fleece weight	3.9	3.8	3.8	3.8	3.9	3.9
Fleece weight, 2-tooth	4.8	5.0	5.0	4.7	5.4	5.0
Fleece weight, 4 and 6-tooth	4.6	4.4	4.4	4.6	4.5	4.3

EJ = ewes joined; EL = ewes lambing; LB = lambs born; LW = lambs weaned.

^b Least squares means from analyses including ewes lambing as two, four and six-tooths.

was 31% (range among years 12-46%). Included among the 504 hoggets analysed were 104 sired by Waihora rams and 98 sired by Ruakura high fertility rams. There was an advantage of Ruakura over Waihora sired daughters in terms of percent lambing as hoggets (42% versus 25%), litter size (1.16 versus 1.12) and lamb survival to weaning (80% versus 67%). The average weaning rate advantage was substantial (39% versus 19%), while the average weaning rate of the 302 Waikite bred hoggets in the closed random-bred line was 20%.

The effect of hogget lambing on subsequent reproductive performance from two to four years of age is summarised here for females born 1971/4 which lambed as hoggets between 1972 and 1975 and as mixed-age ewes between 1973 and 1978. The results from a least squares analysis fitting experimental group (mated and lambed as hoggets, joined as hoggets but failed to lamb, controls first joined as two-tooths), ewe genotype (sired by Ruakura, Waihora or Waikite rams), ewe age (two- four- six-tooth) and year of birth (1971/4) as main effects are summarised in Table 1. Of those animals allocated to experimental groups as hoggets similar proportions each year (averaging about 65-75%) entered the flock as two-tooths. Both liveweight and fleece weight of two-tooth ewes were adversely affected by hogget lambing, resulting in ewes which lambed being 3 kg lighter and cutting 0.2 kg less wool than control ewes. All animals were managed together once they entered the ewe flock and by the four-tooth and six-tooth stage there was little difference among experimental groups in fleece weight or liveweight. Survival to the end of the six-tooth lambing of those ewes joined as two-tooths was 60% for ewes lambing as hoggets and 62% for controls. There was no evidence to date that hogget lambing reduces longevity as found in Norway by Baker *et al.* (1978). Those ewes which were mated and lambed as hoggets exceeded their contemporaries first joined as two-tooths by 10% in terms of weaning rate (LW/EJ), by 12% in average weaning weight of lambs, and 22% in terms of weights of lambs weaned. Those ewes exposed to the ram as hoggets (i.e. combining those that did and did not lamb) had a 6% higher weight of lamb weaned at later lambings than ewes mated for the first time as two-tooths.

The superior hogget lambing performance of ewes sired by Ruakura high fertility rams over either Waihora-sired ewes or Waikite ewes continued to manifest itself at older ages. This resulted in an advantage of 34% for weight of lamb weaned for Ruakura sired ewes over the other two sire sources which, by contrast, had very similar performance levels for most traits other than

prolificacy (LB/EL). Interactions of experimental groups with both ewe age and sire source of the ewe were apparent for most traits with the advantage for the hogget lambing group being more marked at older ages and in the higher fertility groups.

These results clearly demonstrate that joining of ewe hoggets to lamb at one year of age is possible under North Island hill country conditions and that the practice is not detrimental to lifetime productivity. Although not an objective of the trial when it was designed, there is also evidence, consistent with previous out-crossing trials with the Ruakura high fertility line (Clarke, 1978), that some high fertility genotypes excel as hogget lambers as well as showing superior production levels at older ages.

In this trial no lambs produced by one-year old dams were retained in the breeding flock and weaning weights were complicated by variable management practices, in particular very early weaning of late born lambs, and hence are not reported. McCall and Hight (1981) found that a severe maternal handicap was imposed on growth to the yearling stage of lambs born to one-year old dams and few such animals themselves subsequently lambed at one year of age. Unless feed and management conditions are very favourable it may be better to treat all offspring (male and female) from hogget lambings as lambs for sale rather than as breeding material. The use of an early maturing sire breed such as the Southdown might facilitate this and might also result in higher lamb survival.

ACKNOWLEDGEMENTS

To the Lands and Survey Department, Rotorua for making land and animals available for this research study, and in particular, to Mr R. Bedford, (Manager, Waikite Lands and Survey Block) and his staff for managing the experimental programme and recording the data; to Dr A. H. Carter for establishment of the experimental flocks.

REFERENCES

- Apps, A. W. J., 1953. *N.Z. Jl Agric.*, 87: 112.
Baker, R. L.; Clarke, J. N.; Carter, A. H.; Diprose, G. D., 1979. *N.Z. Jl agric. Res.*, 22: 9.
Baker, R. L.; Steine, T. A.; Vabeno, A. W.; Bekken, A.; Gjedrem, T., 1978. *Acta Agric. Scand.*, 28: 203.
Ch'ang, T. S.; Rae, A. L., 1970. *Aust. J. agric. Res.*, 21: 115.
_____, 1972. *Ibid.* 23: 149.

- Ch'ang, T. S.; Raeside, J. I., 1957. *Proc. N.Z. Soc. Anim. Prod.*, 17: 80.
- Clarke, J. N., 1978. *Proc. Ruakura Fmrs' Conf. Aglink FPP 160*, M.A.F. Wellington.
- Clarke, J. N., 1980. *Proc. Lincoln College Fmrs' Conf.*
- Drymundsson, O. R., 1973. *Anim. Breed. Abstr.*, 41: 273.
- Hight, G. K.; Jury, K. E., 1976. *N.Z. Jl agric. Res.*, 19: 281.
- Hohenboken, W.; Vavra, M.; Phillips, R.; McArthur, J. A. B. 1977. *Oregon Agr. Exp. Sta. Tech. Bull.* 138, 24 pp.
- Hulet, C. V.; Wiggins, E. L.; Ercanbrack, S. K., 1969. *J. Anim. Sci.*, 28: 246.
- Levine, J. M.; Vavra, M.; Phillips, R.; Hohenboken, W., 1978. *J. Anim. Sci.*, 46: 19.
- Lewis, K. H. C., 1959. *N.Z. Jl Agric.*, 99: 527.
- McCall, D. G.; Hight, G. K., 1981. *N.Z. Jl agric. Res.* (in press).
- Moore, R. W.; Smeaton, D. C., 1980. *Proc. N.Z. Soc. Anim. Prod.*, 40: 27.
- Steine, T., 1979. In *Effect of Early Breeding on Production Performance of Ewes*. EAAP, Harrogate, England.