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Variation in lamb survival within farm and between farms: results from farmer studies

I.S. TARBOTTON AND R.W. WEBBY

AgResearch, Ruakura Research Centre, Private Bag 3123, Hamilton

ABSTRACT

Variation in lamb losses between scanning and docking were investigated in 1997 in a survey and an on farm study. Ultrasonography results on MA ewes showed a range from 130 to 191% foetuses scanned/ewes present. Ewe weights at joining ranged from 54 to 70 kg. Survival of multiple and single was 78%, and 92% respectively. Differences between scanning and docking comprised 21% ewe deaths, 49% dead lambs and 30% missing/unseen. Paddock docking results were 157% to 188% for ewes with 2 lambs and from 90% to 109% for 1 lamb. Paddocks were assessed on the basis of slope, aspect, shelter, hazards and disturbance. Lack of shelter on easy contours, disturbance and steep slopes appeared to exacerbate lamb deaths. Adverse weather was not a factor in the year of this study.

Keywords: ewe; lamb survival; survey; ultrasonography; farmer study.

INTRODUCTION

From 1992 to 1996, monitor group farmers (Webby and Sheath 1993) located in the King Country districts of the North Island have been pregnancy testing ewes by ultrasonography (Gearhart *et al.*, 1988). The resulting knowledge of pregnancy status at day 60-90 of pregnancy has alerted farmers to the foetal and lamb wastage that occurs. The extent of the differences between scanning and docking is of real concern to farmers striving to increase the efficiency of their sheep production. Lamb wastage particularly in multiples is becoming an increasing issue as ewe fertility improves through the use of newly available high fecundity breeds such as the Finnish Landrace. Smeaton *et al.*, (1999) describes results of nutritional influences on lamb survival and Dalton *et al.*, (1980) describes the influences of breed on lamb survival. Geenty (1997) discusses lambing percentage and the issue of lamb losses. Kelly and Knight (1979) report on reproductive failure in commercial flocks before ultrasonography was adopted as a regular practise on commercial farms. This paper describes our attempts to quantify and identify factors contributing to lamb losses from the time of ultrasonography to docking.

METHODS

The study was carried out in two parts, namely a survey sent out to 30 farmers, and an on farm study. The survey was divided into two sections. The first part was sent out in April 1997 and the second in November of 1997. Respondents were selected from study and monitor farm groups in the King Country and Taupo regions of the North Island (Sheath and Webby 1999) as those known to have pregnancy scanned their ewes. The survey asked questions about farm size, topography, sheep management, farm stock policies and details about ewe numbers and ultrasonography results. The second part of the survey was sent only to the farmers who had completed the first section and cov-

ered ewe management prior to and during lambing, description of the lambing paddocks, weather events and docking results by scanned mob where possible.

The on farm study involved eight farmers with a subset of between 300 and 400 identified ewes selected randomly from their mixed aged main flock. The main sheep breeds involved included Romney and Coopworth with some Finnish Landrace influence ($\frac{1}{2}$ and $\frac{1}{4}$). These ewes were managed in the same way as the rest of the flock. Lambing management involved set stocking the ewes in selected paddocks as either ewes scanned with 1, 2 or 3 lambs. Each lambing paddock was described and categorised and the integrity of the ewe numbers originally set stocked in the paddock was maintained through until docking. The farmer recorded all lambing events including number of dead lambs, apparent reasons for deaths, ewe deaths, and number of times they visited the paddock. Lambs were docked on a paddock by paddock basis. After docking the integrity of the paddock numbers lapsed as the farmers amalgamated paddock groups. The final weighing of the tagged ewes was at weaning.

RESULTS

Results from the on farm study are shown in Table 1. The breakdown of scanning results (foetuses scanned/ewes present) shows the differences between farms in the percentages of ewes scanned with 0, 1, 2 or 3 lambs. The number of ewes scanned with no lambs ranged from 2 to 9%, with 1 lamb from 17 to 39%, with 2 lambs 56 to 70% and with 3 lambs 1 to 13%. One farmer of the 8 did not record ewes scanned with 3 lambs. In comparison Table 2 summarises the data from the survey, here note the higher proportion of ewes scanned with 1 lamb (49%). Consequently those scanning 2 or more was much lower (47%). The rate of ewes scanning 0 lambs was similar. Differences between scanning and docking for the on farm study and the survey indicate that as scanning percentage increases the difference increases.

TABLE 1: On-farm study data, joining and weaning weights, scanning and docking results.

	Ewe Nos.	Joining weight (kg)	Weaning weight (kg)	% of ewes scanned with lambs				% Ewe deaths	Docking %	Difference	
				0	1	2	3				
Farmer A	298	58	61	4	39	56	1	154	7.5	122	32
Farmer B	311	62	59	9	18	68	4	167	3.4	122	45
Farmer C	286	62	63	2	38	59	1	160	3.5	138	22
Farmer D	295	54	53	3	29	64	4	169	3.1	142	27
Farmer E	441	69	65	5	22	66	7	176	2.5	146	30
Farmer F	320	58	60	3	29	68	0	164	3.1	138	26
Farmer G	299	58	68	2	19	67	13	191	3.0	155	36
Farmer H	374	62	67	2	17	70	12	191	4.7	137	54

TABLE 2: Farm survey, joining weight, scanning and docking results

Joining weight (kg)	Ewe No.	% of ewes scanned with lambs				Docking			
		0	1	2 or more	Overall %	Scanned 1	Scanned 2	Overall %	
Averages (total)	61.4	74260	4	49	47	152	93	150	122

For the on farm study, as docking results were collected for identified ewes by paddock and then compared to the potential eg 100, 200 or 300%. Ewes scanned with 1, from 9 paddocks showed a 90 to 109% (average 97%) docking range. Ewes scanned with 2 lambs, from 23 paddocks showed a large docking range of 157 to 188% (average 174%). Ewes scanned with 3 lambs, from 3 paddocks showed a 197 to 209% (average 204%) docking range. Of lambs recorded as dead on each of the 8 farms, those from ewes scanned with 1 lamb ranged from 2 to 33% those from ewes scanned with 2 lambs ranged from 52-85% and with 3 from 11 to 39% for the 7 farms where they were identified. In summary this means on average the dead lambs were made up of 12% scanned as 1 and 88% scanned as 2 or more. When all data (survey and on farm) is summarised (table 3) 92 % of those lambs scanned as 1 survived and 78% of those lambs scanned as 2 or more survived.

A further breakdown of the average lamb losses from scanning (171%) to docking (138%) were made up of ewe deaths, unseen or unaccounted for lamb deaths and observed dead lambs contributing 7, 10 and 16 respectively. The unseen component made up from a range of sources but primarily dead lambs not found to record or ewes unaccounted for. For these 8 farms the ewe death rate from scanning to docking averaged 3.9%.

Paddocks were analysed for the effect of slope, shelter, hazards or human disruptions on docking outcome with no significant difference resulting. Of these, shelter was the one that had the most apparent effect. This would be magnified in seasons with adverse weather conditions. Few paddocks had a high disturbance level but when combined with long narrow paddocks lamb losses appeared most likely to be exacerbated.

DISCUSSION

The cause of lamb deaths from those recorded in the on farm study were similar to those reported by Knight *et al.*, (1988). Table 4 shows for single lambs dystocia was main the cause of death and for multiples starvation-exposure followed by dystocia were the two main causes. Other lesser but still important factors were prenatal death and

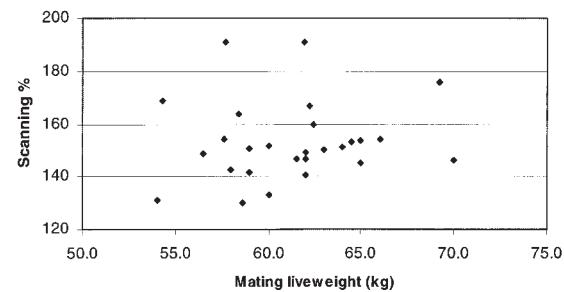
TABLE 3: Lamb deaths by litter size.

	Survival from scanning to docking	S.E.M.
Singles	92%	0.027
Multiples	78%	0.018
Overall	82%	0.016

TABLE 4: Causes of death in single and multiple birth lambs (as % of total deaths).

Cause	Singles	Twin	Triplet	All lambs
Prenatal death	9	12	18	13
Dystocia	53	22	19	24
Starvation-exposure	6	41	30	36
Infections	6	3	0	2
Abnormal lambs	6	1	5	3
Misadventure	0	8	16	10
Unknown	21	12	10	11
Ewe Death	0	2	3	2
	100	100	100	100

FIGURE 1: Ewe liveweights at joining and scanning results.



misadventure. The data in table 4 is from farmer records of their visual assessment of why lambs died.

Figure 1 shows the relationship of ewe liveweight at joining and scanning percentage. Ewes 70 kg at mating were scanning between 146 and 176 % while ewes 54 kg at mating were scanning between 131 and 169%. The relationship between liveweight and scanning percentage is variable, indicating the range of fecundity level and sheep breed represented.

Not all of the differences between scanning and docking can be contributed directly to lambs that have disappeared. This study shows that based on the average scanning percentage of the flocks involved, at least 21% of lamb losses can be contributed directly to recorded ewe deaths. The ewe deaths were made up of a larger component of those carrying multiples and therefore this estimate should be higher (25%+). The unseen component of the losses is also interesting in that it cannot be assumed that these are all lambs. The farmers' records showed that there were also ewes missing, unaccounted for from scanning to docking.

Although the results of this study show an inconclusive lambing paddock affect on lamb deaths, it should be emphasised that no adverse weather events prevailed. Alexander (1983) found shelter reduced wind velocity and hence lamb heat loss and improved survival. Kilgour (1982) emphasises the importance of lamb to ewe bonding in the critical hours after birth and that disturbance would be expected to have an adverse impact on this. Furthermore McMillan and Knight (1985) describe the effect of slope

on lamb mortality particularly with multiples. All of these findings highlight the benefit of selecting lambing paddocks for ewes lambing multiples, that are not steep, are sheltered and located away from unnecessary disturbance.

The docking percentages from paddocks of ewes scanned with one lamb show in some cases more lambs docked than were scanned. This inaccuracy may reflect the skill of the scanning operator with not all foetuses being seen correctly. Some scanning operators will pick up multiples as 2, with triplets not being called unless additional payment is made. One would assume that there were in fact more lambs present at scanning than the scanner actually called. Indeed the author's experience with the lamb survival trials at Whatawhata (Smeaton *et al.*, 1999) showed all lambs present at scanning could be accounted for (including those in dead ewes) at lambing.

This research was driven by the farmers involved seeking to understand more about lamb wastage from scanning to docking. An understanding that would help them reduce these losses particularly as the fecundity of their ewe flocks increased. This study has shown that as the number of multiples increase, survival rate is likely to decline but there are some factors, such as management to reduce ewe deaths that can improve the survival rate of multiple born lambs.

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