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## Incidence of bearings in ewes that had a bearing at the preceding lambing

A.J. LITHERLAND, M.G. LAMBERT, T.W. KNIGHT, T. COOK<sup>1</sup> AND D.B. MCDUGAL

AgResearch Grasslands, Private Bag 11008, Palmerston North.

### ABSTRACT

In the summer of 1998/9, 220 mixed-age breeding ewes were obtained from eight North Island farms. Half of these ewes had had a bearing in 1998 (PB ewes) and the other half were flock mates that had not (NB ewes). Ewes were fed in excess of their requirements from eight weeks before lambing and ewe condition had increased by 0.4 CS units by lambing. At scanning 15% of PB ewes were dry compared to 10% of the NB ewes. Pregnant PB and NB ewes also had similar scanning percentages (151% vs 142% respectively). Twenty percent of PB ewes had a bearing in 1999 (17% in single and 29% in twin pregnant ewes) compared with 0% in NB ewes ( $P < 0.001$ ). Pre-lambing bearings occurred  $18 \pm 2$  days (2-33 days) before lambing. There was a 5% bearing incidence after lambing. Eleven percent of the ewes treated for bearings died before lambing and 78% of surviving treated ewes produced a live lamb. In conclusion, high feeding levels in late pregnancy do not necessarily cause bearings. Ewes with bearings should be clearly identified and culled as they are more likely to have bearings the following year.

**Keywords:** prolapse vagina; nutrition.

### INTRODUCTION

As lambing percentages increase in hill country sheep flocks, vaginal prolapses, commonly called bearings, are becoming an increasing problem. A major limitation to designing experiments to study bearings is their unpredictability and inherent low rate of occurrence. To study bearings it would be helpful to predictably increase bearing occurrence by applying a "bearing challenge".

Bearings were higher both in ewes that had a bearing in the preceding season (Hosie, 1993) and older multiple-pregnant ewes (Grimard *et al.*, 1990; Lambert *et al.*, 1998). It is widely believed by farmers (Bruere *et al.*, 1993; Anon., 1994), with some support from the literature (Hosie *et al.*, 1991), that well-fed ewes are more prone to bearings. Bearing incidence was lower on farms where ewes were grazing low dietary cation-anion balance (DCAB) pastures compared to those grazing high DCAB pastures (Lambert *et al.*, 1998). High DCAB decreases absorption of calcium (Ca) from the diet and mobilisation of Ca from bone in cattle and sheep (Takagi and Block, 1991; Block, 1994; Wilson *et al.*, 1998). Low Ca status in late pregnancy may be one predisposing factor in premature relaxation of the birth canal that leads to bearings (Lambert *et al.*, 1998).

In this experiment we attempted to increase bearing occurrence by increasing lambing percentage, using older ewes and ewes with a history of bearings. Ewes were also fed for the last eight weeks of pregnancy, high DCAB pastures and at levels above their requirements.

### METHODS

#### Animals

In the summer of 1998/9, 220 mixed-age breeding ewes from 8 farms in the King Country and southern North Island were transported to AgResearch's Aorangi Research Station, near Palmerston North. Half the ewes were ewes which had to be treated for bearings in 1998 (PB) and the other half were flock mates that had not (NB). Ewes were laproscopically inseminated on either 1 April or 18 April 1999 following oestrous synchronisation (progesterone-containing slow release vaginal devices (CIDRs) and

stimulation of ovulation number (2 ml Folligon). Ewes were pregnancy diagnosed by ultra sound scanning on 10 June 1999 and the number of dry, single, twin and triplet ewes were recorded. Dry ewes were removed from the experiment after scanning. Ewes were set stocked three days before the start of group lambing.

Ewes were weighed and condition scored (1 emaciated, 5 extremely fat. Geenty, 1997) at monthly intervals up to 8 weeks before lambing and thereafter at two-week intervals. Venous blood samples were obtained from a subset of 60 randomly selected ewes at weekly intervals from 5 weeks before lambing. These samples were analysed for b-hydroxybutyrate (BOH) concentration (McMurray *et al.*, 1984; Animal Health Laboratory, Palmerston North).

#### Pastures

Pasture was allocated to provide more than 1.2 x feed requirements for the mean ewe live weight, fecundity level and time before lambing. Ewes were rotationally grazed until 8 weeks before lambing and were then strip-grazed with daily shifts using electric fencing with no back fencing. From 8 weeks before lambing, pre- and post-grazing herbage mass of the grazed strip was measured daily using a rising plate meter (calibration equation  $200 + 158 \times \text{plate reading}$ ). At weekly intervals, pre-grazing herbage samples representative of the ewes' diet were sampled and analysed for pasture quality by NIR (FeedTech, AgResearch Grasslands) and mineral concentration (Soil Fertility Service, AgResearch Ruakura). The dietary cation-anion balance was defined as the summation in milliequivalents (meq/kg DM) of the cations sodium (Na) and potassium (K) minus the anions chloride (Cl) and sulphur (S).

#### Bearing treatment

Ewes were observed for bearings daily between 9.00 and 10.00 am from 8 weeks before lambing. Ewes with bearings were injected with a long-acting antibiotic to prevent infection, and an epidural injection of local anaesthetic was administered to reduce pain and straining by the ewe. The bladder was emptied by elevating and

gently squeezing the bearing, which was then thoroughly cleaned with disinfectant and replaced. Dissolving vaginal tape was used to purse string suture the bearing in place and the ewe was immediately returned to the mob. At set stocking, undissolved vaginal tapes were cut. This experiment was approved by Palmerston North Animal Ethics Committee.

### Statistical analyses

The effect of previous bearing history on scanning information and bearing incidence was determined using chi square analysis (SAS, 1990). Live weight was analysed using general linear model analysis on individual measurement dates (SAS, 1990).

## RESULTS

### Breeding

Previous bearing (PB) ewes lost 24% of CIDRs during the first round of synchronisation and 17% at second round (11% lost CIDRs both times) compared to 0.9% for the non bearing (NB) ewes. At CIDR insertion, about 20% of PB ewes had vaginal discharges indicative of lower reproductive tract infections. PB and NB had similar dry percentages (15 vs 10% respectively,  $P > 0.10$ ). The potential lambing percentage at scanning for pregnant ewes was not affected by bearing history (PB 151% and NB 142%). Both PB and NB ewes were similar in live weight at mating (60.7 vs 60.3 kg).

### Feed intake, live weight, condition score and serum $\beta$ -hydroxybutyrate

Over the 8 weeks before lambing, mean ( $\pm$  SEM) pre-grazing herbage mass was  $3360 \pm 22$  kg DM/ha and residuals increased progressively from  $1230 \pm 35$  kg to  $1950 \pm 70$  kg DM/ha at set stocking one week before lambing. Estimated ewe intake from the daily breaks increased from  $1.36 \pm 0.03$  kg DM/ewe to  $1.60 \pm 0.06$  kg DM/ewe at lambing. Actual intake was higher than this as ewes were not back fenced. The mean concentrations of crude protein and energy in the herbage were  $28.4 \pm 0.3\%$  DM and  $11.47 \pm 0.03$  MJME/kg DM respectively. Consumed herbage contained the following concentrations of elements: Ca  $0.40 \pm 0.01\%$ ; Mg  $0.250 \pm 0.005\%$ ; Na  $0.164 \pm 0.006\%$ ; K  $3.99 \pm 0.08\%$ ; Cl  $1.09 \pm 0.06\%$ ; and mean DCAB was  $620 \pm 17$  meq/kg DM.

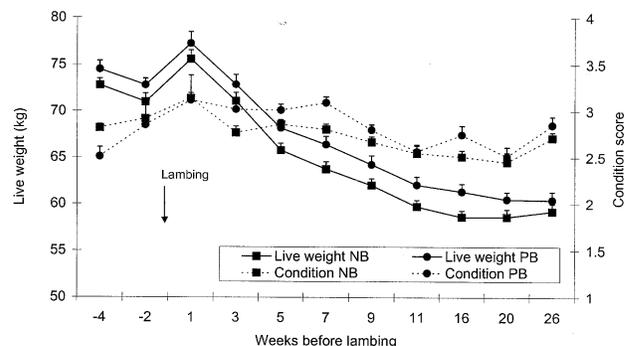
Ewes increased in live weight from  $60.5 \pm 0.6$  kg to  $77 \pm 1$  kg (79 kg twin and 75 kg single ewes) from mating to lambing, and had an average condition score of  $2.91 \pm 0.06$  at lambing. Two weeks after lambing ewes had a mean live weight of  $72.8 \pm 0.5$  kg and a condition score of  $2.89 \pm 0.03$ . The average weight of single and twin born lambs was 5.1 and 4.3 kg respectively ( $P < 0.001$ ). Live weight of NB and PB ewes were similar at mating (60.7 vs 60.3 kg) but from 16 weeks before lambing, PB ewes were 1.0-3.7 kg heavier ( $P < 0.05$ ) and 0.1-0.8 higher ( $P < 0.05$ ) in condition score than NB ewes (Figure 1).

Mean BOH concentrations were  $0.227 \pm 0.009$  mmol/l (mean weekly range was 0.15-0.33 mmol/l) for single ewes and  $0.27 \pm 0.01$  mmol/l (0.22-0.4 mmol/l) for twin ewes over the 5 weeks pre-lambing.

### Bearing incidence

Twenty percent of PB ewes had a bearing in 1999 (17% in single and 29% in twin-pregnant ewes) compared with 0% in NB ewes ( $P < 0.001$ ). Of the bearing ewes that were treated for a bearing in 1999, 6% had the bearing recur. Pre-lambing bearings occurred  $18 \pm 2$  days (2-33 days) before lambing. There was a 5% bearing incidence after lambing. Eleven percent of the ewes treated for bearings died before lambing and 78% of ewes treated for bearings in 1999 produced a live lamb.

**FIGURE 1:** Live weight and condition score of ewes before and after lambing. Error bars are SEM.



## DISCUSSION

The attempt to induce bearings in ewes was largely unsuccessful, the exception being in ewes with a previous bearing history. Twenty percent of these ewes had a recurrence of the condition but the rate of recurrence was much lower than the 50% reported for British studies (Hosie, 1993). The low recurrence rate probably indicates that the ewes received a "low bearing challenge". Recurrence of bearings across years is at least partially due to physical damage of the reproductive tract. Physical damage as a probable cause was suggested by the fact that 54% of the PB ewes that had a bearing in both 1998 and 1999 also lost their CIDRs during oestrus synchronisation. Finally, we discovered when trying to source bearing ewes in December that many farmers could no longer identify the ewes they had treated for bearings in spring. These ewes remained in the flock and would undoubtedly contribute to the bearing problems in the following breeding season.

None of the NB ewes had a bearing despite the over-feeding of the ewes. Ewes had gained 10 kg of ewe maternal live weight during pregnancy in response to the high grazing residuals ( $>1200$  kg DM/ha) and many were fat at lambing (CS  $>3$ ). It is possible that our feeding regimen of break feeding, combined with no back fencing, assured consistent gutfill and prevented gorging by the ewes, thereby reducing large fluctuations in intra-abdominal pressures. Alternatively some, as yet, unknown factor or combination of factors on the research station may have given the ewes with some resistance to bearings. Aorangi Research Station normally has a low incidence of bearings despite having high lambing percentages and high ewe body condition.

The high percentage of dry ewes resulting from our AI programme was disappointing and was probably due to poor feeding associated with drought conditions during mating and a high CIDR loss rate in PB ewes. In the ewes that did conceive, there was no effect of previous bearing history on scanning percentage.

Of the ewes treated for bearings, 11% died before lambing due to either infections or rupture of the bearing. Reported death rates for UK sheep following similar treatment methods range from 10 to 20% (Hosie, 1993). Approximately 80% of ewes treated for bearings produced at least one live lamb. This shows that timely and effective bearing treatment can give alleviate sheep suffering and be economic.

The causes of outbreaks of bearings are still unknown and are probably the result of interactions between a number of factors. It is difficult to see progress being made into bearings until they can be induced on demand. Future research will be conducted on hill country farms where bearings occur consistently.

## CONCLUSIONS

Ewes with bearings should be clearly identified and culled as they are more likely to have bearings the following year.

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