

FITT Final Report (07FT190) (Reducing Bearings on High Performance Sheep Farms)

Years of trial: 2007

**Group that proposed the trial: South Otago MWNZ Monitor Farm
Community Group**

Region: South Otago

Contact person(s): Kelvin Ross (farmer), Richard Copland (Monitor farm
facilitator)

(1) Introduction – background to the project

The South Otago monitor farm (SOMF) has had a history of significant vaginal prolapse (bearings) during the final month of pregnancy. Efforts have been made to quantify the extent of the problem and an average rate of 3 to 7% of the flock has experienced a bearing between 2002 and 2005.

An initial study of the flock in 2005 found no relationship between liveweight, liveweight change or body condition score in the last six weeks of pregnancy and the incidence of bearings. Blood samples taken at the time of the prolapse were paired with samples from unaffected ewes at the time of birth. There were no significant relationships between blood metabolic parameters and bearing incidence that would explain bearing incidence.

A further study was done in 2006 (funded by the SFF) to examine anecdotal evidence that feeding during early pregnancy may help reduce the incidence of bearings. Ewes were split into two mobs in mid-May and fed either on 2 or 4 day shifts until pregnancy scanning, both at the same allowance. The mobs were bought back together from mid-July until lambing and bearing incidence recorded. This produced a promising result with bearing incidence being 3.0% in the 2 day shift mob but only 0.7% in the 4 day shift mob, even though liveweight and BCS changes were similar in both flocks.

(2) Key aims – what was the project trying to achieve?

* A demonstration in 2007 was set up to test if the result of 2006 was repeatable and used the same protocols as the 2006 demonstration. Results of both 2006 and 2007 are presented here to allow for comparison.

(3) Key findings & recommendations for farmers

- Work that was done on the South Otago Monitor Farm showed that there was an opportunity to reduce vaginal prolapse (bearing) incidence through feed management in early pregnancy.
- There appeared to be two factors that reduced bearings:
 - maintaining ewes on an even plane of nutrition (by allocating the correct amounts of feed) from pre-tup to scanning
 - changing how the feed was allocated over this period i.e. shifting every 4 days rather than every 2 days.

In total the impact was to reduce bearings from a consistent rate of 7 % per year (over the previous 4 years) to approximately 2 %. This was repeated for two seasons

Winter	2003	2004	2005	2006	2007
Bearing Incidence	7.1 %	6.8 %	7.0 %	1.9 %	1.89%

- The impact of accurate feed budgeting in maintaining ewe body condition and liveweight.

(4) Methodology and Results

2006 Methods

Two treatments were chosen with 600 ewes allocated to each flock. The treatments began when the ram was removed from the mob on 19 May 2006 and continued for 46 days (4 July 2006) when the mobs were brought back together and treated similarly until lambing, including 4 weeks on a winter swede crop. The flocks were shifted on either every 2 days or every 4 days. The amount of feed allocated at each shift was the same, based on a feed budget and measurement of the feed on offer on each paddock. Live weight and body condition score was measured at the commencement of the trial and on 15 June, 4 July and 31 August 2006.

The incidence of bearings was recorded as they occurred. A final number of ewes recorded were 582 in the 2 day shift and 579 in the 4 day shift. The data was analysed using regression with models fitted to examine the effects of the 4 day shifting treatment adjusted for the live weight and body condition score data.

2006 Results

The overall incidence of bearings was much lower in this year than previous years with only 22 bearings being recorded in the 1161 ewes that were monitored.

Of these 17 were recorded in the 2 day shift (2.9%) compared to 5 in the 4 day shift (0.9%). This reduction was highly significant (t $pr=0.009$).

There was no relationship between liveweight and the incidence of bearings in the 2 day shift treatment, similar to the result found in 2005. However, the incidence of bearings in the 4 day shift was significantly affected by liveweight with lighter ewes being more likely to have a bearing in this mob (t $pr=0.030$). When adjusted for the live weight effect the following predictions of bearing incidence were made.

Mob	% incidence	s.e.
2 day	2.99	0.734
4 day	0.69	0.387

These predictions are estimated mean proportions, formed on the scale of the response variable, corresponding to one binomial trial. The predictions have been formed only for those combinations of factor levels for which means can be estimated without involving aliased parameters and on the mean liveweight made on 15 June of 66.5 kg. The standard errors are appropriate for interpretation of the predictions as summaries of the data rather than as forecasts of new observations.

2007 Demonstration

The demonstration in 2007 was set up using the same protocols as 2006. The ewes were split into two mobs of 647 on 16 May 2007. The feeding regimens of 2 day or 4 day shifting were followed for 66 days until shearing and scanning on the 19 July 2007 when both groups were re-combined and put on swedes until 18 August 2007. During this time an allowance of 1.2 kg/head/day was budgeted, above a residual of 800 kg DM/ha and was supplemented with hay in the last day of the break if the pasture cover could not provide this. A final weighing and condition scoring was done on 28 August 2007 just before set stocking. Due to funding constraints the live weights and body condition scores were only taken on a sample of approximately 100 to 120 for each group. This did not allow statistical analysis of these results.

The overall incidence of bearings within the demonstration mobs was 29 bearings from 1294 ewes in the initial treatment groups or 2.2%. This was slightly higher than the 1.89% recorded in 2006. The incidence in the 2 day shift mob was 19 bearings or 2.94% which was similar to 2006. In the 4 day shift mob there were 10 bearings or an incidence of 1.54%. This was slightly higher than the similar mob in 2006 but the reduction between the 2 and 4 day shifts was of a similar magnitude.

The starting live weight of the ewes in May (Figure 1) was similar in both mobs and in both years, being 62.9 kg in 2007 and 64.6 kg in 2006 (adjusted for fleece and conceptus weight). Body condition score was 3.4 in May 2007 compared with 3.7 in May 2006. Live weight changes over the winter were very similar in both years with ewes increasing in liveweight to an average of 72.3 kg in 2007 compared with a live weight of 72.1 kg in 2006. The true liveweight of the ewes, adjusted for fleece and conceptus growth (Figure 1) declined to 61.5 and 61.3 kg in 2007 and 2006 respectively, in line with body condition score changes. Body condition fell to 3.0 in 2007 compared to 2.8 in 2006. There were no differences in live weight change or BCS between the 2 or 4 day shift mobs in either year.

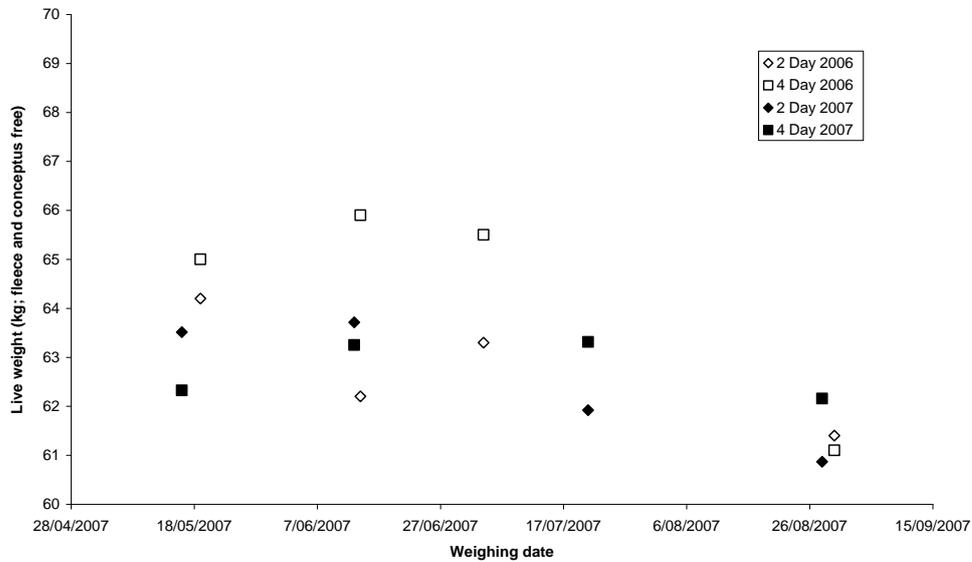
The 2007 demonstration followed the protocols of the 2006 trial very closely and achieved very similar results. A reduction in bearings was observed in both years and was of a similar magnitude in both years.

A major feature of these results is the even liveweight (Figure 1) and BCS profiles that were achieved in both years with accurate feed budgeting. The major reduction of bearings from the historic rate of 3-7% to 1-3% is attributed to the attention to accurate feed budgeting.

The further reduction from 3 to 1% bearings found with the 4 day shifting regimen appears to be repeatable. However, little is understood about the mechanism that may be influencing this change. A theory that dead material accumulated in the autumn may be responsible was investigated by On Farm Research in the Hawke's Bay but provided little evidence to support this. Other thoughts may include a moderation of placental size, as there was little visual evidence to support any changes in pasture conditions between the groups.

Another feature of the 4 day shifting was the settled nature of the sheep, both when shifting and after several days in the paddock. Often added supplement was not utilised, even though budgeted, and ewes retained condition and live weight. A significant feature of this regimen is the provision of swedes for approximately 4 weeks each winter, while allowing pasture to recover. This meant that the winter rotation on pastures was only 66 days. This meant that pasture covers did not exceed 2000-2400 kg DM/ha, allowing for high utilisation while achieving the allowances set.

Figure 1: Live weight profiles of ewes on 2- and 4-day grazing regimens during early pregnancy in 2006 and 2007



(5) Conclusions – what are the ‘take home’ messages?

Bearing incidence was studied in detail on the SOMF over 4 seasons

- There was no relationship found between liveweight, liveweight change or body condition score in the last 6 weeks of pregnancy and the incidence of bearings
- Focussing on maintaining an even liveweight and body condition score profile in early pregnancy (to scanning) through accurate feed budgeting was effective in reducing the incidence of bearings
- The 4 day feeding regimen resulted in settled sheep contrary to farmer expectation. Observation suggested that sheep were not bingeing which was supported by the fact that the added supplement wasn't always utilised even though the feed budget suggested it was needed.
- The 4 day shift approach shows significant promise as a tool for hill country farmers to help further reduce the incidence of bearings while providing an easy to use feed budgeting and management approach.
- Further research is required to investigate the potential mechanisms that may be underlying the success of this management technique.

(6) How will the group apply the project results to their agri-businesses?

Farmers associated with the project and those that have attended the field days expressed an interest in trying the 4 day shifting regimen. Several farmers have gone on to put the system in place, simplifying their winter management system. The project has generated plenty of interest locally through discussion at Monitor farm field days and media articles.

A group of Southland farmers supported by Scandrett Rural Ltd, AgResearch and PGG Wrightson are applying to the SFF to further test the management practice on more intensive lowland sheep farms.

(7) Contact points for more information

Randall Aspinall, PGG Wrightson Consulting, Invercargill
Dr David Stevens, AgResearch, Invermay

References for Bearings

- McLean, JC (1956, 57, 59, 60) completed a number of experiments regarding the incidence of bearings.
- A paper by David Noakes (1999) presented a long list of factors thought to be involved in the disorder.
- Litherland et al (2000) considered bearings when looking at “Management systems for optimising reproductive performance in breeding ewes” (MWNZ project 98PR/44).

- Hilson et al. (2002) “An Epidemiological study of vaginal prolapse in ewes” (funded by AGMARDT, WoolPro, and Meat NZ) was completed over 2000-2002. This surveyed 140 farms in Southland and the Hawke’s Bay for bearing incidence, and monitored specific factors thought to be involved.
- Dolby, Dr R (2005 unpubl. paper). Bearings: What Contributes to These?
- FITT Project 2005: 05FT168 “Reducing Bearings on High Performance Sheep Farms”
- SFF Project 2006: L06/064 “Reducing Bearings on High Performance Sheep Farms”
- FITT project in Hawkes Bay (06FT176) – “Grazing management to reduce bearings” Ewes (140) were exchanged between 2 properties to be fed different amounts of autumn saved pasture in late pregnancy

(9) Appendices –extra information

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Date: 29/02/08

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