

Breech Strike Genetics

This Project is a collaborative research effort of CSIRO Livestock Industries, Armidale, NSW and Department of Agriculture and Food WA funded by AWI

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Welcome to Breech Strike Genetics news

Welcome to the first edition of the Breech Strike Genetics Newsletter, NSW Edition.

This newsletter is intended to provide information to Merino breeders and wool growers about selective breeding for breech strike resistance.

Much of the information we report will arise from a collaborative research project being conducted by CSIRO Livestock Industries and Department of Agriculture and Food WA with the funding support of AWI.



The project team and AWI staff in the shearing shed at CSIRO, Armidale in March 2007 (L-R) Heather Brewer, Ray Honnery, Tim Dyall and Jen Smith CSIRO, Craig Welsh CEO AWI and Jules Dorrian former AWI project leader

Background

With the impending phase-out of conventional mulesing in 2010, one of the alternative control measures will be selective breeding of Merinos for resistance to breech strike.

It is thought that genetic resistance to breech strike can be achieved through selection on indicator traits such as wrinkles, bare area around the breech, dags, and urine stain.

CSIRO and DAFWA are working with AWI to investigate over a range of environments, the commercial impact and effectiveness of breeding for these traits.

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The research project has been set up using sheep sourced from industry in a selective breeding program to evaluate the impact of not mulesing.

The program is duplicated at Armidale, NSW (summer rainfall) and Mt Barker, WA (winter rainfall).

Differences in incidence of breech strike, wool production and cost of production are being evaluated in resistant and control lines at each site.

The work is being conducted on research stations due to the need for close monitoring of the large numbers of unmulesed sheep.

The project commenced in 2005 and will run for 5 years to capture and record seasonal variation in breech strike incidence.

- Jen Smith, Project Leader, CSIRO

*We will be holding a field day on
Thursday, 13th Dec 2007
from 1pm at CSIRO, Armidale
so come along and hear the latest*

Project objectives and design

Objective:

Develop best practice breeding guidelines for breech traits for the sheep industry for the summer and winter rainfall regions

This will be done by;

a) Evaluating the effect of selecting breeding animals on traits known to indicate resistance to breech strike over a range of environments.

The traits include:

- Breech and inguinal bare area
- Breech, body and neck wrinkle
- Dag score
- Urine stain
- Other traits such as wool colour, fibre diameter variability, worm egg count (in relation to dags) etc.

b) Estimating the heritability of breech strike resistance indicator traits and correlations between these traits and fleece/production traits.

Project design:

A 600 ewe breeding flock has been set up at each site. At Armidale the breeding flock is comprised of ewes purchased as weaners in 2005 from 10 eastern-states industry flocks plus some from the Chiswick Resource flock.

There are 3 selection lines of 200 ewes each:

1. Unselected Control (UC)
2. Commercial Improvement (CI) - UC ewes x PB rams
3. Plain Breech (PB) - PB ewes x PB rams

Half the animals in each selection line will be mulesed and half will remain unmulesed

Twelve rams, sourced from industry or bred from within the flock are used each year - 8 PB rams (4 each for the PB and CI lines) and 4 UC's.

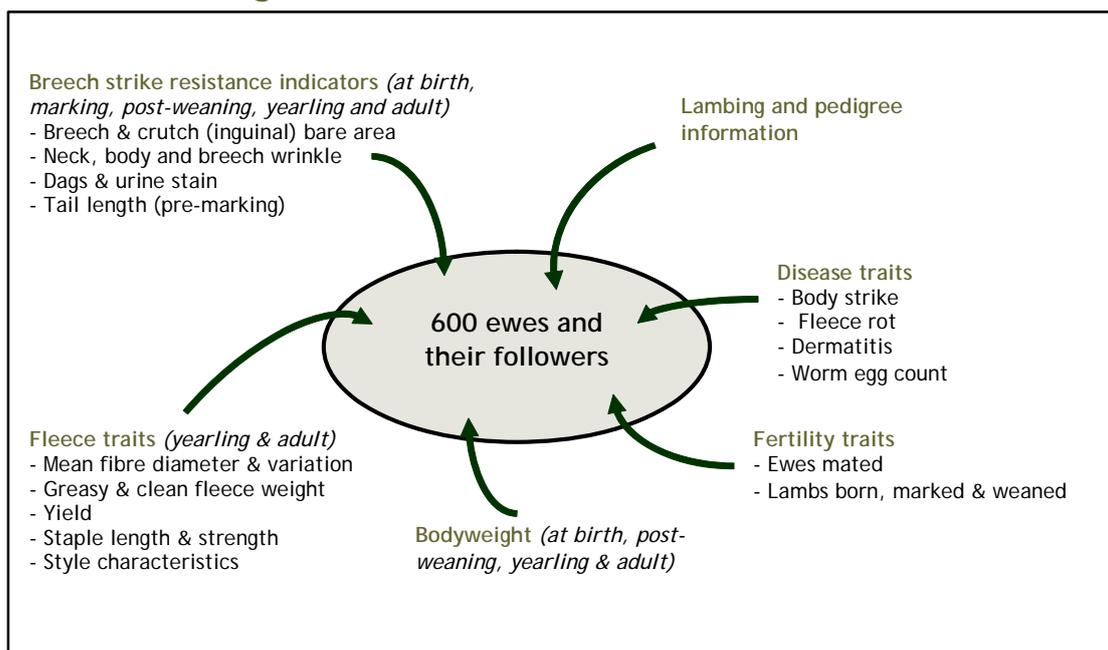
Two of the rams used each year are common to the NSW and WA flocks to provide a genetic link

One ram is used across years to provide an 'across-year link'

Wherever possible, sires are from flocks performance recorded on the Sheep Genetics database.

*The Project team at Armidale:
Jen Smith (Leader), Tim Dyall,
Heather Brewer & Ray Honnery*

What gets measured and recorded



- We are also recording time spent checking for and treating flystrike, changes in fly population, and using local weather information during the fly strike season
- Later in the project we intend to measure crutching and shearing time, proportion of fleece and skirtings, and other measures related to cost of production

Breech strike incidence and results so far

Fly strike

- In 2006/07 the blowfly season ran from early November until late May.
- Sheep were checked for fly strike at least 3 times per week and only struck animals were treated with short acting Extinosad
- Body strikes were prevalent after rain events and were recorded separately from breech strikes

Selection line effects (see also Figure 1)

- The proportion of animals affected by breech strike in the 2005 drop ewes was not significantly different between the unselected control and the breech trait selected lines
- However, in the 2006 drop lamb/weaners the incidence of breech strike in the unselected control line was significantly higher than in the selected lines
- In the 2006 drop, selection on breech traits offered a similar level of protection from breech strike to mulesing in the unselected control line

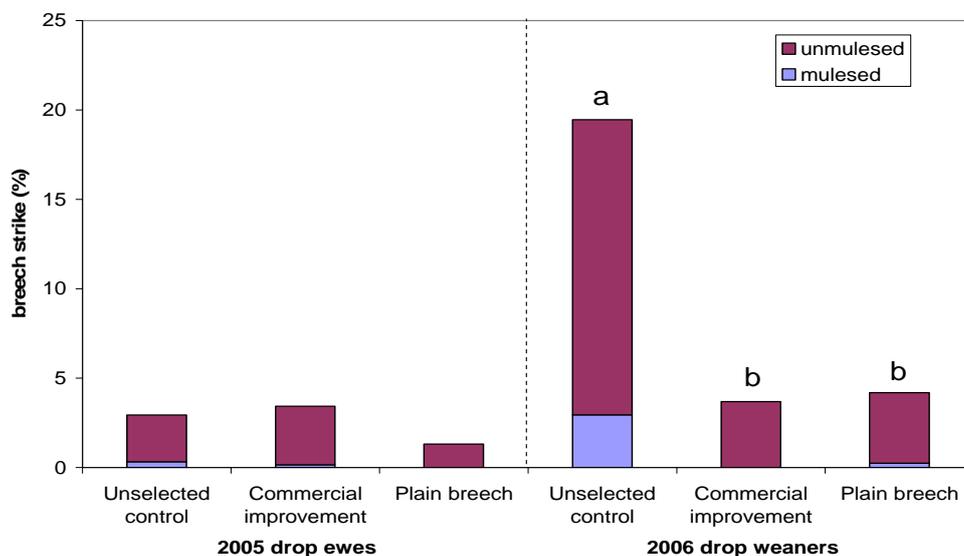
Sex effects

- In the 2006 drop weaners, females were significantly more likely to be affected by breech strike than males (32% vs 19%).
- It is likely that urine stain plays a role in susceptibility in females

Association between breech strike and indicator traits

- In the 2006 drop at post weaning stage the unselected control line had significantly higher breech wrinkle and dag score, and lower bare breech and bare crutch area than both the commercial improvement and selected lines
- Early results suggest that of the breech traits examined, breech strike is most closely

The difference in breech strike between selection lines in 2006/07 was a remarkably good result at this stage of the program and we wait expectantly to see if it is repeated this summer. It was interesting and promising however, that a similar result was achieved in WA last year (see p. 5 for details).



"In the 2006 drop, selection on breech traits offered a similar level of protection from breech strike to mulesing in the unselected control line"

Figure 1. Incidence of breech strike in 2005 drop ewes and 2006 drop weaners in 2006-07. Within flocks, different superscripts indicate lines were significantly different

Breech strike incidence and results so far (cont'd)

Table 1 shows the overall incidence of breech and body strike in the 2005 drop (purchased) ewes and the 2006 drop (1st progeny from industry sires) in the 2006-07 flystrike season. This suggests that culling animals that get repeatedly struck is a useful way to reduce breech strike in your flock.

Table 1. Flystrike incidence in 2006-07

	2005 drop ewes (n=612)	2006 drop lambs/weaners (n=406)
Breech strikes (%)	7.7	27.3
Repeats # (%)	25.7	22.5
Bodystrikes (%)	0.8	3.4

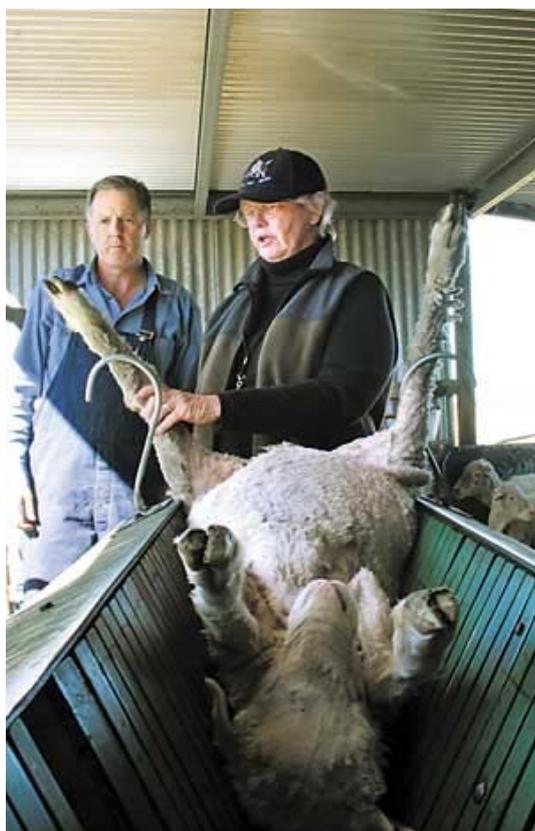
percentage of breech struck animals that were struck more than once throughout the fly season

Table 2 shows the average score for several breech strike resistance indicator traits assessed on the 06 drop at post-weaning.

Table 2. Selection line means for breech strike resistance indicator traits

Trait	Unselected Control	Commercial Improvement	Plain Breech
Breech wrinkle score	2.6	1.8	1.9
Bare breech area score	1.3	1.8	1.9
Bare crutch area score	2.0	2.8	2.8
Dag score	1.5	0.9	0.9

Note: 1 = low ... 5 = high;



(L-R) Project staff Tim Dyall and Heather Brewer assessing breech traits in the Armidale flock

“Early results suggest that of the breech traits examined, breech strike is most closely associated with breech wrinkle”

Effect on bodyweight

- In the 2006 drop, mulesed lambs had significantly lower bodyweight at weaning, but the difference was non-significant by 6 months of age.
- Animals in the unselected control line were approx. 2kg lighter at weaning than those in the 2 selected lines, but we believe this is due to inclusion of some broader wool/larger frame types in the selected lines.

Armidale Mating Program 2007 News from the WA team

Mating of the breech strike genetics flock at Armidale is conducted by intrauterine artificial insemination (AI) in April each year.

Twelve industry sires are used - four each for the Unselected Control (UC), Commercial Improvement (CI) and Plain Breech (PB) lines.

In 2007 the breeding flock consisted of 600 maiden ewes (being those purchased in 2005). Each sire was mated to approximately 50 ewes.

In 2007 we were very pleased with the level of interest in providing industry sires for the AI program.

In the end we chose sires from Quambaloo Poll (2006, 2007 year link), Miramoonna, Petali, Roseville Park, Calcookara (across-flock link), Centre Plus (across flock link) and Cressbrook to use in the Commercial Improvement and Plain Breech lines. We used 4 CSIRO T13 sires for the Control line.

As the program progresses we expect to increasingly be able to select sires bred from within the Plain Breech or Commercial Improvement lines.

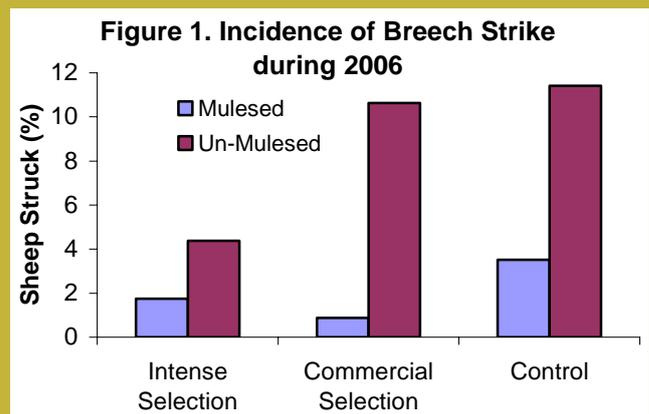
Lambs were scored and measured for breech traits prior to marking in late October. We'll report breech trait results of the 2007 drop lambs at the annual field day in December.



WA achieves great results in 2006

"The WA team are very excited about the results they have been able to achieve with their weaners during 2006. The breakthrough came when we found that using the indicator traits to select lambs produced a line of un-mulesed sheep with the same level of breech strike as sheep that were surgically mulesed".

"In the mulesed sheep, 3.5% of the control line was struck compared with 4.4% of the un-mulesed sheep in the intense selection line. In the control line 11.4% of the un-mulesed sheep were struck. This means that there was the same level of breech strike in the un-mulesed selected animals as the mulesed control animals (Figure 1)".



"We anticipated good results, but after only one year, these results are exceptional and very exciting. It was also pleasing to see the line selected for resistance were heavier throughout 2006, and did not appear to produce any less clean wool. However there was an interaction between the lines and the source properties".

- Bindi Murray, DAFWA Katanning

- John Karlsson, DAFWA Katanning

- Johan Greeff, DAFWA Perth

(Left) We are looking for bare breech sires for our mating program in 2008. If you have a suitable plain bodied and/or bare breech sire please contact us so we can arrange for an inspection or for you to send us photos and details about the sire. Performance information is also important (fibre diameter, fleece weight, etc).

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Breech Strike Genetics is produced by CSIRO Livestock Industries, Armidale NSW.

We intend to produce two newsletter issues per year

Your feedback and thoughts are welcome.

Please send to tim.dyall@csiro.au or contact Tim on 02 6776 1463

Staff Profile - Jen Smith

Jen has a Degree in Rural Science and a PhD in Quantitative Genetics relating to wool quality, both from UNE.

Apart from Breech Strike Genetics, Jen's other main research interest is in wool quality and staple strength. She is an integral part of the team that runs the CSIRO's Toward 13 Micron Project (T13).

In her 'spare' time, Jen runs a rugged ultrafine wool growing business with husband Darren and children Lynden and Erin at Kentucky, NSW.



CSIRO's Jen Smith with Harold Manttan, AWN, inspecting wool at a Newcastle sale

Please let Tim know:

- If you didn't receive this newsletter directly and would like to be placed on the mailing list for future issues
- If you prefer to receive the newsletter by email rather than in the post
- If you have any neighbours, clients or friends we should add to the mailing list