

# Industry Report

## Breeding for breech strike resistance

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**A**WI, CSIRO Livestock Industries (Armidale) and DAFWA (Mt Barker) are conducting a program to obtain the necessary genetic information to enable breeders to develop breeding programs for increased breech strike resistance.

A suite of indicator traits for breech strike are under investigation for determination of those most useful for inclusion in breeding programs. These traits include wrinkle scores (neck, body and breech); breech and crutch cover scores; dag and urine stain scores; and measured breech traits such as bare area width and depth; tail length; and bare area on the underside of the tail. With the exception of the tail traits, which clearly cannot be measured after tail-docking, these traits are measured at several age stages including birth, lamb-marking, post-weaning, yearling and as adults, and are accompanied by fleece measurements, bodyweights and records of reproduction rate.

All of the animals are fully pedigreed. To allow the comparison of genetic improvement to mulesing as a means

of reducing breech strike, each year half the progeny are mulesed and the other half remain unmulesed. An important additional aspect of this work is that there is no use of long acting preventative chemical treatment for flystrike. Information on all flystrike (body and breech) is recorded in detail and this will enable the estimation of correlations between the various indicator traits and flystrike itself.

### Some of the key results from the Armidale flock to date are;

1. Differences among animals in breech cover increase with age and observed differences among animals in wrinkle score change with wool growth. The implications for these changes in variance lie in the rate of *response to selection*, which is dependent upon, among other things, phenotypic variance – the more the better. So it is best to delay scoring breech cover for as long as practically possible (i.e. off shears as yearlings). And, score wrinkles at a time when wool length is short e.g. at lamb-marking, or off-shears as yearlings (but not at weaning or post-weaning unless you tip-shear weaners).
2. Although both breech wrinkles and breech cover appear at least moderately heritable, there is relatively more variation in breech wrinkle than breech cover and the distribution of wrinkle scores tends more toward a normal distribution than does breech cover. In most finewool flocks the distribution of breech cover is skewed to the left – i.e. there are very few animals with score 1 or 2 and most are 4 or 5. This means there are few animals exhibiting the desired breech cover characteristic and therefore available for selection into the next generation. Hence, in flocks

that are essentially unselected for breech traits, faster gains can probably be achieved in breech wrinkles than breech cover.

3. The traits most closely associated with breech strike itself are breech wrinkle and dags. But, that is not to say that breech cover is not an important trait. The incidence of low breech cover scores in finewool sheep is generally very low and it may simply be that the mean breech cover score for the flock needs to be below some threshold before you see effects of low breech cover on breech strike rates.
4. The extent of neck, body and breech wrinkles are closely correlated and although there are unfavourable associations between these wrinkles and fleece weight, the correlations are low and therefore can be accommodated in a multi-trait breeding objective.

The results from the project to date suggest that for those about to embark on selective breeding for breech strike resistance, the best bet is to focus on wrinkles initially and perhaps look more at breech cover once the sheep have become less wrinkly.

Sires used in this experimental breeding program are being sourced from industry flocks and many are from flocks that are performance recorded in Sheep Genetics. It is intended that this genetic linkage will facilitate better and faster development of ASBVs for breech strike resistance traits. For reasons mentioned above, initially, the focus is on wrinkle score. Progress in development of across-flock ASBVs for wrinkle score can be helped considerably with widespread recording of wrinkle scores in industry flocks and submission of that wrinkle data to the Sheep Genetics database.



A clear indication of the difference in the selection and control lines at AWI's Breech Selection Flock at Mt Barker, WA