2022 FLYSTRIKE RD&E

TECHNICAL FORUM

Breech Flystrike Genetic Trends

Geoff Lindon – AWI

10 August 2022

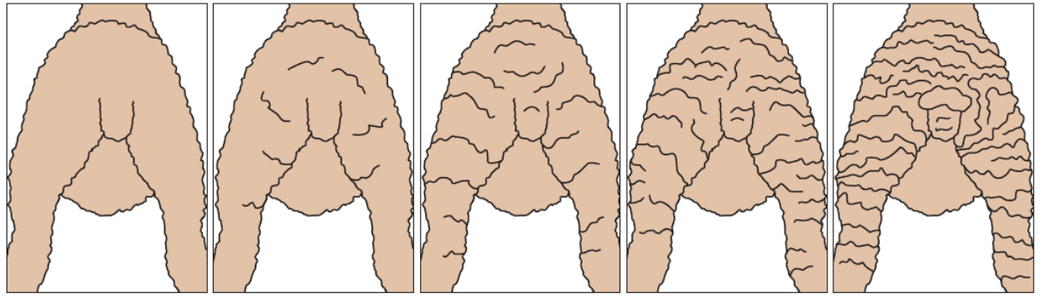
Breech Flystrike Merino Genetic Trends

Topics

1. Recap of Breech Strike Risk Factors
2. Breed Breech Flystrike Genetic Trends - ASBVs
3. 2020 Drop ASBVs by Breed and Type
4. 2020 Drop Trait Percentiles – What is possible?
5. What do trends and percentiles highlight?
6. Questions

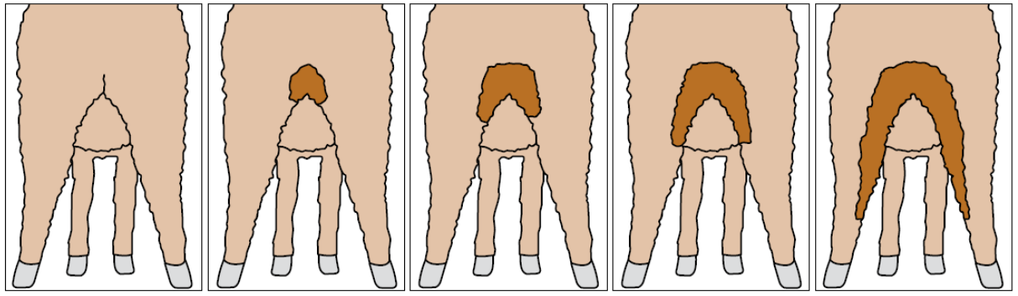
Breech Flystrike Genetic Trends – Recap of Breech Flystrike Risk Factors

Breech Wrinkle



---------- Low ---------- / ---------- Higher ----------

Urine Stain



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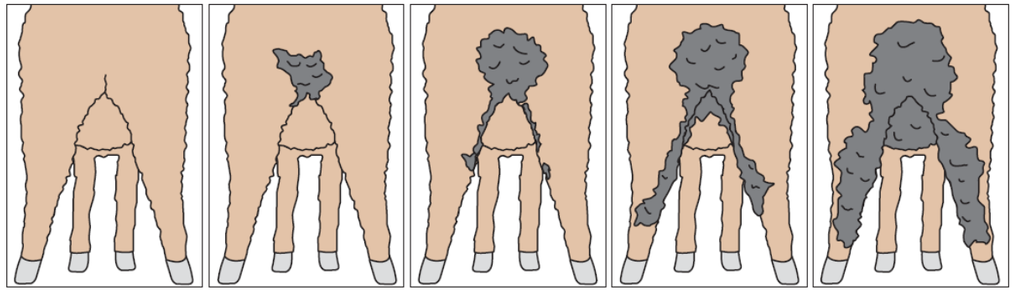
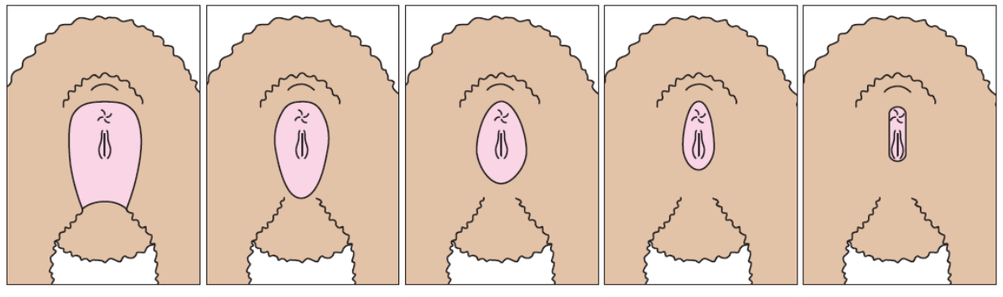
Dag



---------- Low ---------- / ---------- Higher ----------

Breech Cover



---------- Low ---------- / -------- Higher ---------

Source AWI -MLA Visual Sheep Scores

Breech Flystrike Genetic Trends – Recap of Breech Flystrike Risk Factors

	Breech Wrinkle	Dag	Urine Stain	Breech Wool Cover	Late Wool Colour
Strike Risk	High	Very High	Very High	Moderate	Moderate
Overall Relative importance	***	**	**	*	*
Australian Sheep Breeding Values	Yes	Yes	To be created	Yes	Yes – low data not easy to find

Faecal Consistency ASBV – To be created

MERINOSELECT welfare enhanced indexes for April 2023

(Rule of Thumb - Mulesing reduces wrinkle by 1.0 Score, Urine Stain by 0.5 Score and Dags by 0.4 Score
- The higher the starting natural score, the greater the reduction
- Sets the challenge for breeding without increasing reliance on chemical and crutching
- But every 0.1 reduction in score reduces risk)

Breech Flystrike Genetic Trends – ASBV Merino Breed Genetic Trends

MERINO BREED	YFD Micron	EBWR Score	EBWR Records	LDAG Score	EBCOV Score	YWEC %	ACFW %	AWT Kg	WR Lambs	MPP Points
2010	-1.2	-0.10	39,092	-0.04	-0.06	-8.6	6.2	1.8	0.03	130
2012	-1.2	-0.12	46,967	-0.02	-0.07	-9.9	7.2	2.1	0.03	132
2014	-1.1	-0.13	47,939	-0.03	-0.08	-12.6	8.6	2.3	0.04	135
2016	-1.1	-0.13	60,223	-0.04	-0.10	-13.0	9.9	2.3	0.05	138
2018	-1.0	-0.13	81,623	-0.05	-0.09	-13.0	11.6	2.8	0.06	142
2020	-1.0	-0.20	123,732	-0.08	-0.11	-12.4	13.4	2.6	0.09	148

Source MERINOSELECT 16th June 2022

Breech Flystrike Genetic Trends – ASBV Merino Breed Genetic Trends

MERINO BREED	YFD Micron	EBWR Score	EBWR Records	LDAG Score	EBCOV Score	YWEC %	ACFW %	AWT Kg	WR Lambs	MPP Points
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Source MERINOSELECT 16th June 2022

Breech Wrinkle and Fleece Weight are negatively correlated (-0.3), but ram breeders have been selecting and achieving gains in both.

Breech Flystrike Genetic Trends – ASBV Merino Breed Genetic Trends

MERINO BREED	L WOOL COLOUR Score	L FLEECE ROT Score
2010	-0.13	-0.06
2012	-0.10	-0.04
2014	-0.13	-0.07
2016	-0.13	-0.03
2018	-0.13	-0.04
2020	-0.08	-0.02

Source MERINOSELECT 16th June 2022

- Low number of animal records for both - from 1,383 to 5,775 /year
- Most R&D and Sire Evaluation Data
- ASBVs are not commonly reported or used by ram breeders
- As chemical resistance increases the focus on these traits will increase

Breech Flystrike Genetic Trends – 2020 Drop ASBVs by Merino Type

2020 Drop Type	YFD Micron	EBWR Score	LDAG Score	EBCOV Score	YWEC %	ACFW %	AWT Kg	WR Lambs
MERINO	-1.0	-0.20	-0.08	-0.11	-12.4	13.4	3.8	0.09
SUPER FINE	-1.6	+0.14	-0.02	+0.04	-9.2	7.8	1.8	0.05
FINE	-1.1	-0.09	-0.07	-0.06	-12.4	15.2	3.9	0.12
MEDIUM	-0.7	-0.45	-0.07	-0.21	-11.5	15.9	4.8	0.07

There are 10,541 nominated Super Fine animals with a direct breech record 59,111 Fine's and 27,601 Medium's

There is a difference of 0.59 wrinkle score and 0.25 Cover Score between Super Fine and Medium types

Source MERINOSELECT 16th June 2022

Breech Flystrike Genetic Trends – 2020 Drop ASBVs by Merino Type

2020	L WOOL COLOUR	L FLEECE ROT
Type	Score	Score
MERINO	-0.08	-0.02
SUPER FINE	-0.53	-0.22
FINE	-0.09	-0.03
MEDIUM	+0.18	+0.12

Source MERINOSELECT 16th June 2022

- Only 1,383 records for 2020 drop
- High micron merinos (Mediums) have low Breech Wrinkle but high Wool Colour and Fleece Rot
- Highlights for low micron sheep, in high body strike regions, a rapid reduction in breech wrinkle runs the risk of increasing micron and shifting flystrike from the breech to the body

Breech Flystrike Genetic Trends – 2020 Drop Trait Percentiles – What's possible

Many traits are antagonistic and very hard to get top 5% of key traits in one animal, there are a few AI sires close to top 20%, but top 5% some years off yet

2020 Drop	YFD	EBWR	LDAG	EBCOV	YWEC	ACFW	AWT	WR
Percentile	Micron	Score	Score	Score	%	%	Kg	Lambs
Top 5%	-2.7	-1.13	-0.42	-0.71	-54.3	29.2		0.23
Top 20%	-1.8	-0.69	-0.25	-0.39	-36.5	21.7		0.15
Top 40%	-1.2	-0.35	-0.14	-0.18	-21.9	16.1		0.09
Top 60%	-0.8	-0.06	-0.04	-0.02	-7.8	11.3		0.05

Source MERINOSELECT Website Aug 2022

(Rule of Thumb
- Mulesing reduces wrinkle by 1.0 Score, Urine Stain by 0.5 Score and Dags by 0.4 Score
- The higher the starting natural score, the greater the reduction
- Sets the challenge for breeding without increasing reliance on chemical and crutching
- But every 0.1 reduction in score reduces risk)

Breech Flystrike Genetic Trends and Percentiles – What do they highlight?

- Macro breech trait trends are slow to date - but increasing
- Most gains are in $ traits: - fleece, lambs, worms, swing to Polls
- Growers currently rely more on management than genetics (See NWD Stats)
- Growers reluctant to trade breech for body strike
- Breech trait data collection is growing rapidly – impacts the trends
- Macro trends also hide large progress by individual ram breeders
- Impact of restocker market (Discount for NM sheep varies across regions, from nil to very large)

Australian Wool Innovation Limited

2022 FLYSTRIKE RD&E

TECHNICAL FORUM

Flystrike Genomics

Where to from here?

Geoff Lindon – AWI

10 August 2022

Flystrike Genomics – Where to from here?

- Selecting for lower breech traits is effective, cheap - visual only or +ASBVs
- Target Scores required are low and more difficult for low micron Merinos
- But some higher breech trait animals have lower strike than expected
- Can genomics help find resistant, high fleece, weight low micron Merinos?
- AWI – AGBU contract til late 2027 – Dr Elena Dehnavi et al

Flystrike Genomics – Where to from here – AWI / AGBU R&D Contract

- Past CSIRO R&D on AWI “Breeding for Breech Strike Resistance Flocks”
  - no genes with large effect, some genes with more potential - dags
  - more data required
- AGBU combining all existing data sets for analysis (Sheep CRC, MLA, AWI, Private)
  - MERINOSELECT has moved to single step combined analysis – uses all data avail
  - Prior experience (other hard to measure traits), need quality data
  - Post MLP – a Merino Genomic Flock is needed – for range of other tough traits, fertility, survival, efficiency, methane, resilience etc, effective to combine into 1

Flystrike Genomics – Where to from here – What might be cost effective?

- The number of high data quality “on-farm” Merino ram breeders testing large numbers of progeny for genomics has escalated
- BCS Agribusiness investigating effective technical and commercial options
  - Would lots of commercial data, site, struck / not struck with DNA help?
  - For higher data quality what else is optimal?
    - Pedigree, Age, Management Group, Breech Trait Scores and ASBVs,
    - Fleece Trait ASBVs
    - Size and date of strike, chemical application history, etc
  - Business case: for breeders and AWI. Collaboration with MLA.