LOWER WRINKLE AND DAG
REDUCE THE RISK OF BREECH STRIKE

Breech Wrinkle and Dags are the key breech strike risk traits. Every 0.1 reduction reduces the lifetime risk of breech strike.

As there is a general unfavourable relationship between fleece weight and wrinkle, it is important to pursue sires that are good for both (as well as fertility, growth, structure and the other resilience/welfare traits, in a balanced approach). There are sires and studs that bend this relationship; these "curve benders" are relatively higher in fleece weight and lower in wrinkle.

Wrinkle and Dags are the main causes of breech strike followed by Breech Cover and Urine Stain. AWI-funded research conducted at Armidale NSW (CSIRO) and Mt Barker WA (DAFWA) shows that every 0.1 reduction in breech trait scores, lowers the risk of lifetime breech strike for both mulesed and un-mulesed animals.

Table 1 opposite is a summary of the Australian Sheep Breeding Values (ASBVs) of 158 AI sires from 27 Merino studs, from the MERINOSELECT website, listed in increasing Breech Wrinkle order. The variation in AI sire stud averages are large for Wrinkle, Cover and the key production indexes; Breech Wrinkle averages ranges from -1.2 to +0.9, Breech Cover from -1.3 to 0.3 and the indexes around 60 index points.

The Wrinkle ASBV required to move to a non-mules operation without a large increase in chemical control, varies with factors such as climate, management systems, the size of the commercial property and nutritional value of the pastures. Wrinkle ASBVs can be higher for sheep raised on low protein and low energy country as the sheep 'express' less wrinkle when run in these environments. In production systems with high nutritional levels, more emphasis needs to be placed on lower Wrinkle ASBVs. There are 5 non-mules studs listed in the table with differing wrinkle scores; Studs Nine and Ten have an AI sire average Wrinkle ASBVs of -0.3, Stud Five averages -0.8 and Studs Two and One average -1.0 and -1.2.

However, for sheep that are moderate or high in the key breech trait scores, any reduction in Wrinkle, Dag and Cover will reduce the lifetime risk of breech strike. The lower the score pre-mulesing, the lower the score post-mulesing.

Breeding for good productivity as well as welfare is important for the commercial viability of the stud and its clients. There is a trend in the table that shows the lower Wrinkle studs have lower Adult Fleece Weight. But some studs buck the trend. Stud Seven has the highest Adult Fleece Weight at +24 with a relatively low Wrinkle at -0.4 showing the extent to which some studs and sires are bending the curve. and thereby reducing lifetime welfare risks and not sacrificing fleece weight.

Studs with similar Adult Fleece Weight and Fibre Diameter can have considerable variation in Wrinkle. Studs Eight, Fourteen, Nineteen and Twenty Three have reasonably similar Adult Fleece Weights (+17, +15, +15 and +14) and Fibre Diameter (-0.8, -1.1, -1.1 and -0.7) but large variation in Wrinkle (-0.3, 0.0, +0.1, +0.4).

There is also considerable variation between the studs' AI sires for dags and worm resistance. These traits can be important in high worm and dag country and not important in low dag and low worm country.

There is a trend for lower Fertility with increasing Wrinkle and Fleece Weight. However Studs Thirteen, Seventeen and Twenty Two have similar NLW (5%, 4% and 3%) and Fleece Weights (9, 7, 11) but have reasonable differences in Fibre Diameter (-0.2, -2.0 and -1.1) and Wrinkle (0.0, 0.1 and 0.4), which again shows there are curve bending sires.

Studs Twenty Four, Twenty Six and Twenty Seven have low Fibre Diameter (-3.0, -3.0 and -2.5) and high Wrinkle +0.5, +0.6 and +0.9. The path to non-mules without a high reliance on chemicals and other Dag reduction tools is a long one for most low Fibre Diameter Fine and Super Fine studs, but every 0.1 reduction improves lifetime welfare.

As ASBVs become more robust with increasing data being collected by breeders (particularly Adult Fleece Weight, Breech traits and Fertility, at joining, scanning, lambing and weaning) and with the outcomes of the AWI Merino Lifetime Productivity project, the confidence and speed which breeders will be able to improve productivity as well as welfare traits will increase.

Knowing how genetics and environment interact to create an animal's phenotype on a commercial property is an important step in knowing what targets to set, to maximise lifetime productivity and welfare.

TABLE 1. AVERAGE ASBVS FOR AI SIRES LISTED BY STUDS ON THE MERINOSELECT WEBSITE AI SEMEN CATALOGUE (Listed in increasing wrinkle order)

Stud	Mules status	YWT	AWT	YEMD	YFAT	YCFW	AGFW	YFD	YDCV	YSL	YSS	YWEC	NLW	EBWR	EBCOV	LDAG	FP+	MP+	DP+
		kg	kg	mm	mm	%	%	um	%	mm	N/Ktex	%	%	Sc	Sc	Sc	Index	Index	Index
Stud 1	NM	9	8	2.3	1.2	14	5	1.6	-1.0	17	1.7	-18	4	-1.2	-0.6	-0.2	100	119	141
Stud 2	NM	12	10	2.8	1.4	18	3	0.4	-1.5	25	0.8	-5	5	-1.0	-1.3	0.2	114	137	161
Stud 3		9	8	-0.1	-0.1	21	6	-1.4	-1.7	20	1.2	-5	3	-1.0	-0.2	0.1	144	157	156
Stud 4		9	8	2.1	0.7	13	3	-0.2	-1.9	11	3.9	0	-1	-0.8	0.0	0.0	127	138	150
Stud 5	NM	9	9	2.5	1.2	18	4	0.7	-0.9	22	-0.5	0	1	-0.8	-1.2	0.3	107	125	149
Stud 6		5	5	1.5	1.0	8	-1	0.0	-2.7	13	3.1	-37	8	-0.7	-1.1	0.3	119	126	142
Stud 7		3	2	0.1	-1.0	31	24	-0.9	0.1	16	2.4	-14	-1	-0.4	0.1	0.2	163	174	172
Stud 8		7	7	-0.7	-0.3	30	17	-0.8	-0.5	13	1.6	6	6	-0.3	-0.3	0.1	145	165	163
Stud 9	NM	5	4	1.3	0.8	10	1	-1.2	-1.1	13	-1.8	-7	3	-0.3	-0.8	0.2	118	126	136
Stud 10	NM	1	1	0.2	-0.1	13	7	-1.0	-0.7	9	1.3	-4	2	-0.3	-0.1	0.0	136	139	139
Stud 11		11	8	2.2	1.5	25	10	-0.1	-1.5	14	3.6	-71	3	-0.2	-0.6	-0.1	142	157	173
Stud 12		10	9	0.5	0.4	24	11	-1.8	-1.5	11	0.6	-13	10	-0.1	-0.3	-0.1	166	184	191
Stud 13		7	9	0.7	0.3	18	9	-0.2	-0.7	8	1.2	-21	5	0.0	-0.1	0.1	128	145	155
Stud 14		6	4	0.6	0.1	27	15	-1.1	-0.3	7	-0.8	23	0	0.0	-0.2	0.2	144	161	162
Stud 15		5	4	0.1	0.4	14	3	-1.6	-1.8	7	0.9	-37	1	0.1	-0.1	0.0	146	148	143
Stud 16		3	3	-0.4	-0.2	17	12	-0.7	-1.7	10	2.5	16	0	0.1	-0.1	-0.1	138	144	138
Stud 17		3	2	-0.1	0.0	14	7	-2.0	0.2	2	0.1	20	4	0.1	0.1	0.0	144	152	151
Stud 18		8	7	0.6	0.1	23	11	-1.0	-0.3	10	-1.1	0	0	0.1	-0.5	0.2	136	149	152
Stud 19		7	6	-0.2	-0.2	23	15	-1.1	-0.2	13	-0.3	7	1	0.1	-0.2	0.2	145	158	159
Stud 20		4	2	-0.9	-0.7	21	16	-1.7	-0.8	8	0.8	20	-1	0.2	0.0	0.1	150	159	147
Stud 21		3	2	-1.0	-1.3	18	12	-1.5	-0.9	1	0.0	20	-3	0.3	0.2	0.5	142	150	136
Stud 22		11	11	-0.1	-0.3	23	11	-1.1	-0.8	7	0.5	0	3	0.4	-0.4	0.3	143	161	164
Stud 23		4	3	-0.6	-0.6	20	14	-0.7	1.1	5	-1.9	0	1	0.4	-0.1	0.1	131	144	140
Stud 24		3	1	0.1	-0.3	17	6	-3.0	0.4	6	-3.1	-22	-1	0.5	0.1	-0.1	156	159	149
Stud 25		3	2	-0.8	-0.3	22	13	-2.1	-0.6	2	-1.0	-9	0	0.6	0.3	0.3	158	165	155
Stud 26		3	1	0.2	0.2	15	6	-3.0	-1.4	1	0.3	-35	-2	0.6	0.1	0.0	162	158	148
Stud 27		4	2	-0.9	-0.7	28	20	-2.5	0.0	6	-2.3	0	-2	0.9	0.2	0.1	163	172	157
Min		1	1	-1.0	-1.3	8	-1	-3.0	-2.7	1	-3.1	-71	-3	-1.2	-1.3	-0.2	100	119	136
Max		12	11	2.8	1.5	31	24	1.6	1.1	25	3.9	23	10	0.9	0.3	0.5	166	184	191
Range		10	10	3.7	2.8	23	24	4.6	3.7	24	6.9	94	13	2.0	1.6	0.7	66	65	55
2015 drop percentile ranges																			
Top 1%		11	11	2.8	1.7	29	21	-3.6	-2.6	22	7.1	-72	13	-1.0	-0.8	-0.4	160	173	176
Top 5%		9	8	2.1	1.2	24	17	-2.7	-2.0	16	5.0	-53	9	-0.8	-0.6	-0.3	150	159	161
Top 20%		6	6	1.1	0.6	18	12	-1.9	-1.1	11	2.8	-34	5	-0.5	-0.3	-0.2	140	147	146
Top 50%		6	3	0.2	0.0	12	6	-1.1	-0.7	6	0.6	-14	1	-0.1	-0.1	0.0	129	134	133
Top 80%		6	0	-0.5	-0.5	5	0	-0.3	0.1	1	-1.6	9	-3	0.2	0.1	0.1	117	120	121

DEFINITIONS

YWT Yearling Body Weight; **AWT** Adult Body Weight; **YEMD** Yearling Eye Muscle Depth; **YFAT** Yearling Fat; **YCFW** Yearling Clean Fleece Weight; **AGFW** Adult Greasy Fleece Weight;**YFD** Yearling Fibre Diameter; **YDCV** Yearling Fibre Diameter Coefficient of Variation; **YSL** Yearling Staple Length; **YSS** Yearling Staple Strength; **YWEC** Yearling Worm Egg Count; **NLW** Number of Lambs Weaned; **EBWR** Early Breech Wrinkle; ***EBCOV*** Early Breech Cover; **LDAG** Late Dag; **FP+** Fibre Production Plus Index; **MP+** Merino Production Plus Index; **DP+** Dual Purpose Plus Index; **NM** Not Mulesed.

2000 is the base year for Wrinkle, Cover and Dags and 1990 is the base year for all other traits

See www.sheepgenetics.org.au/MerinoSelect and then select 'Sale and semen catalogues'.