

MERINOSELECT ASBVS BY FIBRE DIAMETER AND THEIR GENETIC TRENDS

There are significant production differences in Merino sheep that can be highlighted by grouping animals based on fibre diameter. Over the past 200 years, selective breeding, differences in climatic conditions and markets, and different historical breed groups – such as the Saxon, Spanish, Rambouillet, Peppin, and English Long Wools – have all contributed to these differences.

On the opposite page ram breeder flocks have been grouped into five categories based on their average Adult Fibre Diameter (AFD) Australian Sheep Breeding Value (ASBV). Table 1 highlights the production data for each category, while Tables 2 through 6 detail the genetic trends within these categories since 2000. Despite significant antagonisms between some traits, ram breeders in all categories continue to achieve progress in key traits. Some individual ram breeders outperform the averages. The entry of new breeders or increased phenotyping of traits by existing breeders have not had significant impacts on the overall or diameter category trait trends.

Table 1 outlines the average ASBVs for a range of traits (wool, carcass, reproduction, parasite-related traits for worms and flies, and four key industry indexes) for the 2022 drop progeny, from flocks grouped into five AFD ASBV categories (<-3, -3 to -2, -2 to -1, -1 to 0, and 0 to +1). This data, sourced from AGBU/MERINOSELECT, serves as a benchmark for Merino breeders aiming to set realistic and impactful ASBV targets based on their flock's adult micron ASBV.

By setting slightly improved targets within their AFD category for key economic and welfare traits, breeders can significantly enhance the index most relevant to their micron type and production system.

Performance across fibre diameter categories

- **Super fine wool flocks (<-3.0 AFD ASBV):** These flocks perform well not only in fibre diameter and the Fine Wool Index, but also in traits such as Eating Quality (IMF and Shear Force), Worm Resistance, Wool Colour, Fleece Rot and Wool Character. However, they relatively underperform other micron types in Fleece Weight, Staple Length, Body Weight, Litter Size, Breech Wrinkle, and Breech Wool Cover.
- **Mid-micron wool flocks (-1 to 0 AFD ASBV):** These flocks perform well for Fleece Weight, Body Weight, Fat, Eye Muscle Depth, Weaning Rate, Breech Wrinkle, Breech Wool Cover, and the Merino Lamb Index. However, they lag in IMF and Shear Force, Wool Colour, Fleece Rot, and Wool Character.

Of note are:

1. **Genetic diversity:** Merinos display significant variation in fibre diameter and body weight across categories.

2. **Reproduction trends:** Higher micron categories exhibit higher weaning rates driven by increased litter size.
3. **Wrinkle vs. fleece rot:** Low-micron flocks have higher breech wrinkle scores and lower fleece rot, while high-micron flocks exhibit the opposite. Selecting for lower breech wrinkle (lower risk of breech strike) can often result in increased fibre diameter, wool colour issues, fleece rot and higher risk of body strike.
4. **Eating quality:** Super fine flocks tend to perform well for eating quality, but improvements in IMF and Shear Force can now be actively selected for all Merino types. These trends are more important with the very recent announcement of a cost effective reasonable line speed test for IMF.

Genetic gains since 2000

Tables 2–6 demonstrate genetic trends in key traits, including fleece weight, fibre diameter, and breech wrinkle. While breeders across all micron groups have made consistent gains, distinct trends are evident:

- **Low-micron breeders (<-3 AFD):** Have focused heavily on reducing fibre diameter and improving worm resistance, while other breeders have reduced their emphasis on worm resistance.
- **Mid-micron breeders (-1 to 0 AFD):** Have balanced improvements across multiple traits, including fat, muscle, fleece weight, fibre diameter, reproduction, and wrinkle.
- **High-micron breeders (0 to +1 AFD):** Have achieved significant gains in fat and muscle but at the expense of fleece weight, micron, wool colour, and shear force (perhaps

unnecessarily given mid micron breeder trends and relative indexes).

The tables are averages for each micron category and some individual breeders are making faster changes than others. It is hoped that some new structural assessment ASBVs, like feet and backs, will be introduced soon so these traits can also be objectively monitored.

Emerging trends and opportunities

- **Reproduction components:** MERINOSELECT now reports the three component traits: Conception, Litter Size, and Ewe Rearing Ability along with Weaning Rate. While weaning rate gains have primarily come from increased litter size, there is now potential to specifically improve ewe rearing ability as well.
- **Economic and welfare priorities:** Most breeding programs focus on high-impact economic and welfare traits. However, adapting to changing markets and climatic conditions, such as micron premiums or parasite pressures, requires time to collect the measurements and gain genetic momentum in a balanced manner.

While genetic trends reflect change across key traits, the pace of improvement is influenced by breeders' emphasis on specific traits, the expanding number of traits being selected, current market demands and predictions of future market demands. Detailed analysis of the trends have shown that new breeders and expanded phenotyping by existing breeders don't significantly bias the trends.

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Table 1. 2022 drop MERINOSELECT ram breeder animals, above a minimum accuracy, allocated into micron ranges based on the flock's average AFD ASBV over the last five years

				Wool					Carcass						Reproduction			
Indicative ave AFD of flock	Flock ave FD ASBV	Birth year	Animals recorded	YFD	AFD	YGFW	ACFW	YSL	YWT	AWT	YFAT	YEMD	IMF	SF5	WR	CON	LS	ERA
				micron	micron	%	%	mm	kg	kg	mm	mm	%	kg	Lamb/ewe	Ewe preg	Lamb/litter	Wean, born
15-16	<-3	2022	2,404	-3.08	-3.34	5.2	5.2	1.0	0.5	-1.0	0.20	0.36	0.50	-0.22	0.08	0.02	0.03	0.03
16-17	-3 to -2	2022	15,761	-2.33	-2.44	13.3	13.3	3.2	2.9	1.8	-0.25	-0.14	0.02	0.95	0.07	0.01	0.05	0.01
17-18	-2 to -1	2022	60,179	-1.33	-1.39	14.2	13.7	7.4	5.9	5.0	-0.08	0.36	-0.36	1.56	0.11	0.02	0.07	0.03
18-19	-1 to 0	2022	63,384	-0.56	-0.61	15.3	14.2	11.1	7.0	5.8	0.23	0.82	-0.28	1.40	0.15	0.04	0.09	0.03
19-21	0 to +1	2022	4,868	0.23	0.32	12.4	12.0	15.2	8.2	7.3	1.05	1.77	-0.14	0.62	0.18	0.04	0.13	0.03
	Total/ave	2022	146,596	-1.08	-1.14	14.4	13.7	8.7	6.1	5.0	0.08	0.55	-0.26	1.36	0.12	0.03	0.08	0.03

Indicative ave AFD of flock	Flock ave FD ASBV	Birth year	Animals recorded	Worms	Flystrike						Index			
				YWEC	EBWR	EBCOV	LDAG	LCOL	LFROT	LCHAR	FW	WP	SM	ML
				%	Score	Score	Score	Score	Score	Score	Points	Points	Points	Points
15-16	<-3	2022	2,404	-28.4	0.43	0.18	-0.01	-0.81	-0.27	-0.54	175	160	132	116
16-17	-3 to -2	2022	15,761	0.3	0.25	0.09	-0.02	-0.51	-0.14	-0.42	172	163	133	118
17-18	-2 to -1	2022	60,179	-0.6	-0.19	-0.07	-0.05	-0.19	-0.06	-0.36	159	156	135	122
18-19	-1 to 0	2022	63,384	-16.6	-0.44	-0.17	-0.12	-0.09	-0.09	-0.19	154	155	139	127
19-21	0 to +1	2022	4,868	-14.8	-0.62	-0.41	-0.22	0.12	0.01	0.15	135	140	133	127
	Total/ave	2022	146,596	-8.3	-0.25	-0.11	-0.08	-0.18	-0.08	-0.28	158	156	136	124

Table 2. Genetic trends of MERINOSELECT ram breeder animals with flock AFD ASBV <-3 over last 5 years, above accuracy thresholds

Birth year	Animals recorded	YWT	AWT	YFAT	YEMD	YGFW	ACFW	YFD	YWEC	IMF	SF5	WR	CON	LS	ERA	EBWR	EBCOV	LDAG	LCOL	LFROT	FW	WP	SM	ML
		kg	kg	mm	mm	%	%	micron	%	%	kg	Lamb/ewe	Ewe preg	Lamb/litter	Wean/born	Score	Score	Score	Score	Score	Points	Points	Points	Points
2000	1,246	-2.3	-3.2	0.29	0.50	-7.9	-4.8	-1.70	-11.8	0.22	-0.35	0.03	0.04	-0.02	0.00	0.65	0.42	0.19	-0.62	-0.33	126	116	105	101
2005	2,606	-3.4	-4.0	0.37	0.52	-10.4	-6.5	-2.40	-14.5	0.55	-1.07	0.03	0.02	0.00	0.00	0.43	0.30	-0.01	-0.70	-0.32	132	119	103	101
2010	2,575	-2.8	-3.4	0.23	0.34	-9.3	-5.8	-2.68	-20.3	0.62	-1.10	0.02	0.01	0.01	0.01	0.41	0.19	-0.07	-0.72	-0.21	142	126	111	104
2015	2,742	-1.9	-2.6	0.21	0.30	-4.6	-1.1	-2.90	-25.6	0.59	-0.66	0.05	0.02	0.01	0.01	0.56	0.23	0.04	-0.73	-0.22	154	137	117	107
2020	2,549	-0.4	-1.6	0.19	0.26	3.2	3.9	-3.14	-26.1	0.54	-0.39	0.06	0.01	0.02	0.02	0.57	0.22	-0.01	-0.82	-0.22	171	152	127	113
2022	2,404	0.5	-1.0	0.20	0.36	5.2	5.2	-3.08	-28.4	0.50	-0.22	0.08	0.02	0.03	0.03	0.43	0.18	-0.01	-0.81	-0.27	175	160	132	116
Change since 2000		2.9	2.2	-0.09	-0.14	13.1	10.0	-1.38	-16.6	0.27	0.13	0.05	-0.02	0.05	0.03	-0.22	-0.24	-0.19	-0.19	0.05	49	43	27	15

Table 3. Genetic trends of MERINOSELECT ram breeder animals with flock AFD -3 to -2 over last five years, above accuracy thresholds

Birth year	Animals recorded	YWT	AWT	YFAT	YEMD	YGFW	ACFW	YFD	YWEC	IMF	SF5	WR	CON	LS	ERA	EBWR	EBCOV	LDAG	LCOL	LFROT	FW	WP	SM	ML
2000	3,661	-1.9	-2.5	0.30	0.33	-3.4	1.1	-1.38	1.7	0.16	-0.92	-0.03	0.00	-0.02	-0.01	0.29	0.08	0.06	-0.10	0.08	122	118	98	97
2005	6,477	-2.1	-2.6	0.26	0.17	-3.6	0.1	-2.05	-10.1	0.25	-0.36	0.00	0.01	-0.02	0.00	0.13	0.09	-0.04	-0.27	-0.09	133	124	102	98
2010	11,494	-0.5	-0.9	-0.02	0.04	3.8	6.3	-2.01	-5.9	0.18	0.17	0.00	0.00	0.00	0.00	0.22	0.09	-0.02	-0.31	-0.13	144	134	112	106
2015	13,369	0.9	0.1	-0.21	-0.19	7.5	8.9	-2.20	-10.2	0.14	0.59	0.02	-0.01	0.03	0.00	0.32	0.07	0.03	-0.33	-0.02	156	146	121	111
2020	17,928	2.1	1.1	-0.26	-0.17	10.4	10.7	-2.28	1.1	0.05	0.82	0.07	0.01	0.05	0.01	0.34	0.08	-0.01	-0.44	-0.06	166	157	129	115
2022	15,761	2.9	1.8	-0.25	-0.14	13.3	13.3	-2.33	0.3	0.02	0.95	0.07	0.01	0.05	0.01	0.25	0.09	-0.02	-0.51	-0.14	172	163	133	118
Change since 2000		4.8	4.3	-0.55	-0.48	16.7	12.2	-0.95	-1.4	-0.14	1.87	0.10	0.01	0.07	0.02	-0.05	0.01	-0.08	-0.41	-0.22	50	45	35	21

Table 4. Genetic trends of MERINOSELECT ram breeder animals with flock AFD -2 to -1 over last five years, above accuracy thresholds

Birth year	Animals recorded	YWT	AWT	YFAT	YEMD	YGFW	ACFW	YFD	YWEC	IMF	SF5	WR	CON	LS	ERA	EBWR	EBCOV	LDAG	LCOL	LFROT	FW	WP	SM	ML
2000	8,986	-0.3	-0.5	0.06	0.16	1.2	2.9	-1.25	12.3	0.08	-0.11	-0.01	0.01	-0.01	0.00	0.01	-0.13	0.01	-0.12	0.02	123	118	107	105
2005	13,605	1.5	1.3	0.00	0.16	2.5	4.1	-1.31	4.3	-0.13	0.63	0.00	0.00	0.02	0.00	-0.02	-0.07	0.01	-0.18	-0.06	132	127	114	107
2010	20,059	2.1	1.6	-0.05	0.18	4.4	5.6	-1.46	8.9	-0.18	0.95	0.01	-0.01	0.02	0.00	-0.06	-0.04	-0.03	-0.24	-0.09	138	132	117	109
2015	42,314	3.1	2.5	-0.19	0.09	8.5	9.1	-1.41	-2.3	-0.26	1.28	0.04	0.01	0.04	0.01	-0.10	-0.04	0.02	-0.19	-0.08	146	141	123	113
2020	62,515	4.8	4.0	-0.13	0.24	12.5	12.6	-1.32	1.2	-0.33	1.50	0.09	0.02	0.06	0.02	-0.12	-0.05	-0.02	-0.17	-0.05	154	150	131	119
2022	60,179	5.9	5.0	-0.08	0.36	14.2	13.7	-1.33	-0.6	-0.36	1.56	0.11	0.02	0.07	0.03	-0.19	-0.07	-0.05	-0.19	-0.06	159	156	135	122
Change since 2000		6.3	5.5	-0.14	0.20	13.0	10.8	-0.08	-12.9	-0.44	1.67	0.12	0.02	0.08	0.03	-0.20	0.06	-0.06	-0.07	-0.08	37	38	28	17

Table 5. Genetic trends of MERINOSELECT ram breeder animals with flock AFD -1 to 0 over last five years, above accuracy thresholds

Birth year	Animals recorded	YWT	AWT	YFAT	YEMD	YGFW	ACFW	YFD	YWEC	IMF	SF5	WR	CON	LS	ERA	EBWR	EBCOV	LDAG	LCOL	LFROT	FW	WP	SM	ML
2000	1,626	2.9	2.4	0.13	0.09	6.5	8.5	-0.38	-7.1	-0.06	-0.23	0.02	0.01	0.07	-0.03	0.01	-0.13	0.11	0.17	0.06	124	125	111	108
2005	11,682	3.3	2.9	0.14	0.41	8.6	9.8	-0.69	-17.0	-0.05	0.30	0.06	0.01	0.05	0.00	-0.04	-0.09	-0.04	-0.05	-0.07	133	133	118	113
2010	15,671	4.3	3.4	0.12	0.49	8.6	9.3	-0.65	-25.7	-0.05	0.40	0.08	0.02	0.05	0.02	-0.13	-0.09	-0.04	0.05	-0.05	137	136	124	117
2015	32,909	4.6	3.8	0.07	0.42	10.8	11.8	-0.69	-20.6	-0.15	0.90	0.07	0.01	0.04	0.02	-0.21	-0.12	-0.07	-0.14	-0.08	143	143	128	118
2020	64,926	5.8	4.8	0.11	0.55	13.5	13.6	-0.63	-12.7	-0.25	1.17	0.12	0.03	0.07	0.03	-0.36	-0.16	-0.09	-0.11	-0.07	150	150	134	123
2022	63,384	7.0	5.8	0.23	0.82	15.3	14.2	-0.56	-16.6	-0.28	1.40	0.15	0.04	0.09	0.03	-0.44	-0.17	-0.12	-0.09	-0.09	154	155	139	127
Change since 2000		4.1	3.4	0.10	0.73	8.8	5.7	-0.18	-9.4	-0.22	1.62	0.13	0.03	0.02	0.06	-0.45	-0.05	-0.23	-0.26	-0.15	31	31	27	19

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Table 6. Genetic trends of MERINOSELECT ram breeder animals with flock AFD 0 to 1 over last five years, above accuracy thresholds

Birth year	Animals recorded	YWT	AWT	YFAT	YEMD	YGFW	ACFW	YFD	YWEC	IMF	SF5	WR	CON	LS	ERA	EBWR	EBCOV	LDAG	LCOL	LFROT	FW	WP	SM	ML
		kg	kg	mm	mm	%	%	micron	%	%	kg	Lamb/ewe	Ewe preg	Lamb/litter	Wean/born	Score	Score	Score	Score	Score	Points	Points	Points	Points
2000	2,243	3.8	3.7	0.42	0.52	14.4	17.6	0.01	-3.2	-0.13	2.04	0.04	-0.02	0.00	0.05	-0.63	-0.27	-0.25	-0.08		113	131	119	110
2005	2,346	4.9	4.6	0.24	0.67	14.9	17.9	0.13	1.3	-0.18	1.41	0.07	-0.01	0.04	0.04	-0.86	-0.39	-0.23	0.53	0.35	129	136	122	114
2010	1,077	5.7	5.7	0.30	0.87	12.2	15.8	0.19	-17.4	-0.32	1.58	0.12	0.01	0.06	0.04	-0.84	-0.36	-0.21	0.28	0.14	128	136	125	120
2015	4,298	6.2	5.7	0.47	0.97	10.2	11.9	0.24	-11.5	-0.36	1.24	0.12	0.01	0.08	0.04	-0.38	-0.13	0.00	0.00	0.05	117	124	121	116
2020	6,102	7.2	6.4	0.83	1.50	11.4	11.9	0.27	-5.4	-0.23	0.96	0.14	0.03	0.11	0.03	-0.68	-0.40	-0.20	0.06	0.03	128	135	126	121
2022	4,868	8.2	7.3	1.05	1.77	12.4	12.0	0.23	-14.8	-0.14	0.62	0.18	0.04	0.13	0.03	-0.62	-0.41	-0.22	0.12	0.01	135	140	133	127
Change since 2000		4.3	3.6	0.63	1.25	-2.0	-5.6	0.22	-11.6	-0.01	-1.43	0.13	0.05	0.13	-0.01	0.01	-0.14	0.03	0.20	0.01	22	9	14	17

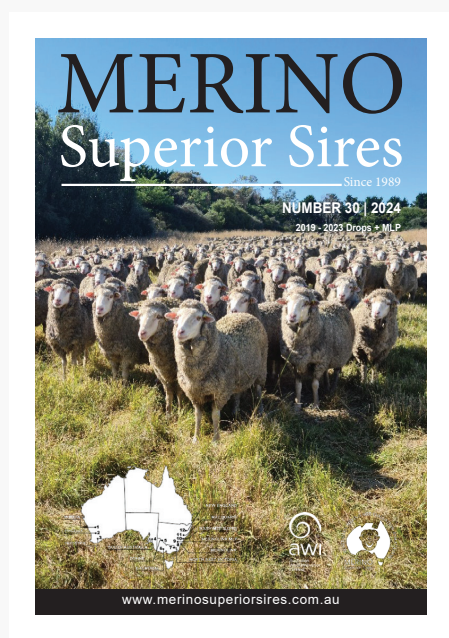
Abbreviations: YFD Yearling Fibre Diameter, AFD Adult Fibre Diameter, YGFW Yearling Greasy Fleece Weight, ACFW Adult Clean Fleece Weight, YSL Yearling Staple Length, YWT Yearling Body Weight, AWT Adult Body Weight, YFAT Yearling Fat, YEMD Yearling Eye Muscle Depth, IMF intramuscular fat, SF5 Shear Force, WR Weaning Rate, Con Conception, LS Litter Size, ERA Ewe Rearing Ability, YWEC Yearling Worm Egg Count, EBWR Early Breech Wrinkle, EBCOV Early Breech Cover, LDAG Late Dag, LCOL Late Wool Colour, LFROT Late Fleece Rot, LCHAR Late Wool Character, FW Fine Wool Index, WP Wool Production Index, SM Sustainable Merino Index, ML Merino Lamb Index.

Source: AGBU and MLA Sheep Genetics – MERINOSELECT. 25 July 2024 MERINOSELECT run.

Notes: Flock progeny have been allocated into micron categories based on their flock average AFD ASBV over the last five years. Tables include ram breeder flocks only; R&D and Sire Evaluation progeny are not included. Animals with low accuracy are not included. Flocks averaging over +1 AFD ASBV have not been included.

MERINO SUPERIOR SIRES NO 30 NOW AVAILABLE

Having commenced providing services to ram breeders and commercial woolgrowers alike in 1989, Merino Sire Evaluation continues to grow in Australia. The 30th edition of the annual Merino Superior Sires publication demonstrates the volume, quality and diversity of the sires that are entered.



2024 marks the release of the 30th edition of the sought-after industry resource Merino Superior Sires. Published annually by the Australian Merino Sire Evaluation Association (AMSEA), Merino Superior Sires details both the measured and visual performance of well over 400 sires entered at any one of the 12 Merino Sire Evaluation sites operating across Australia.

Published in Merino Superior Sires are Australian Sheep Breeding Values (ASBVs) for a wide range of both measured and visually classed traits that are collected as part of the rigorous and independent assessment program

that AMSEA oversees through its network of industry managed sites. In addition, an independent Classifier's Grade is also reported giving users an insight into the conformation and wool quality traits that are not expressed through an ASBV.

One of the key features of Merino Sire Evaluation is that sites carry out assessments at the hogget or adult stage. This is significantly later compared to many on farm assessments and adds accuracy and robustness to the results published.

A major change to Merino Superior Sires in 2024 is the inclusion of the four new MERINOSELECT Indexes. The Fine Wool (FW), Wool Production (WP), Sustainable Merino (SM) and Merino Lamb (ML) indexes, which were released earlier this year, are important tools to help drive genetic improvements. Each of these indexes combine multiple traits, or ASBVs, into a single value that reflects a certain production emphasis on these traits. Collectively, these traits make up the breeding objective of the index which aims to improve profitability in commercial sheep enterprises.

The four indexes provide for a range of breeding objectives that are common across sheep breeding programs.

- **Fine Wool (FW)** – The majority of the income is from the wool clip, with a strong focus on reducing micron.
- **Wool Production (WP)** – The majority of the income is from the wool clip, with a strong focus on increasing wool production.

- **Sustainable Merino (SM)** – The majority of the income is from the wool clip, and sheepmeat production is balanced.
- **Merino Lamb (ML)** – The majority of the income is from sheepmeat production, particularly lambs, with some income from the adult ewe wool clip.

Each of these new indexes is reported on every sire entered as well as in the Top 50 reports, which rank sires for each of the indexes alongside a range of relevant traits. In a sign of the genetic gain being made in the industry, many of the sires ranked are young sires that are being published in Merino Superior Sires for the first time.

Once again this year, a number of additional reports have also been released exclusively via the Merino Superior Sires website in conjunction with the online and hardcopy Merino Superior Sires 30. The Top 20 highly used sires has once again been published, along with an All Time Top 50 for each of the four new MERINOSELECT indexes which includes rams from the past 30 years of sire evaluation trials.

Merino Superior Sires No 30 is available for download at www.merinosuperiorsires.com.au or in hard copy by contacting merinosuperiorsires@bcsagribusiness.com.au

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