white suffolk
Better by Design

2023

AWSA Satellite Flock Project No 2

MEAT & LIVESTOCK AUSTRALIA

Steve and Debbie Milne
Richmond Hill Agribusiness P/L
Project Managers
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Abstract

This second Australian White Suffolk Association (AWSA) Satellite flock project was again attempting to broaden the footprint of sires used widely in the White Suffolk breed that have had lambs slaughtered and measured for eating quality traits. The project also aimed to contribute to the validation of Intramuscular Fat (IMF) data collected by the Meat Eating Quality (MEQ) probe at slaughter with the actual IMF measurements post slaughter. Both of these aims were achieved by the project.

The project targeted those sires that had the least relationship to the Meat and Livestock Australia (MLA) Reference Flock with the most progeny numbers across the most number of flocks within the White Suffolk breed. This increased the accuracy of LMY, eating quality and carcase ASBVs for those sires and all their relatives within the population.

There was a very small increase in accuracy (WWT increased by 0.5% and PEMD increased by 1.4%) for the sires in the project for growth and muscle traits from the start to the end of the project. There was a significant increase in accuracy for carcase and eating quality traits following the submission of actual carcase measurements to the Sheep Genetics analysis. Intramuscular Fat (IMF) accuracy increased on average 22.7% and Shear Force (SF5) increased on average by 18.8%.

This corresponded with an increase in index accuracy on average of 11.9% for TCP and 17.9% for LEQ. This is consistent as there is more emphasis on improving carcase and eating quality traits in the LEQ index.

At the end of the project there were 7,386 progeny by the sires in this project with data in Lambplan from 131 flocks. The consequent increase in accuracy for all sires in the project will flow through to all their progeny and all other related animals within the breed. This increase in accuracy allows breeders to make better informed breeding program decisions in relation to carcase and eating quality traits with a subsequent increase in the rate of genetic gain.

Lamb Marking

The AI team Day 2

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Background

The **MLA Resource Flock** collects reference data (physical measurements = phenotypes) for use in genomic testing, as well as providing a resource for additional R&D projects. The data collected is used for the purpose of generating Australian Sheep Breeding Values (ASBV's) and other genetic and genomic information, for delivery to sheep breeders through Sheep Genetics.

MLA Resource Flock lambs are measured for every trait possible as well as their carcases being measured for carcase and eating quality traits. Genomic tests using the Resource Flock population as the reference, allow eating quality ASBVs to be produced for live animals. Animals that are closely related to the sires used in the Resource Flock therefore get much more accurate ASBVs for eating quality traits through Genomic tests.

A key component of the Resource Flock project is to seek additional co-investment from industry into the collection of genotypes matched to hard-to measure phenotypes on progeny from commercial (non-research) flocks known as Satellite Flocks

The major aim of this second White Suffolk Satellite Flock project remains to assist in the accuracy of selection for hard to measure traits for the White Suffolk breed. These traits include carcase and eating quality traits.

Eating quality traits are vitally important to the future of the lamb industry. One of these traits can now be measured at chain speed and a premium is being paid to producers for superior eating quality. It is vital that seed-stock producers include these traits in their breeding objectives.

Research was conducted into the benefits to the White Suffolk breed in applying for the Satellite Flock proposal. It was found there were still a significant number of Sires used widely in the breed that did not have a close relationship to the Resource Flock. By broadening the footprint of White Suffolk lambs that are related to the Resource/Satellite Flocks, it would allow more breeders to use Genomic tests and receive more accurate ASBVs for eating quality traits. This then means better selection decisions and faster genetic gain.

The **Australian White Suffolk Association** was successful in its application to run a second **Satellite Flock** project in 2023.

Lambs after scanning October 2023

Project Objectives

Aim

The aim of the Satellite Flock project is to increase the number of White Suffolk sires in the MLA Resource and Satellite Flocks. This will increase the accuracy of ASBVs for eating quality traits for those sires and therefore their progeny and relatives across the breed. Breeders are then able to make better selection decisions and increase the rate of genetic gain for these traits. This will ultimately improve returns for stud breeders and lamb producers and ensure quality lamb for consumers.

Objectives

1. Increase the number of White Suffolk sires represented in the Resource and Satellite Flocks to broaden the footprint within the breed of animals with phenotypic information for eating quality traits.

2. Join the selected sires to an even line of commercial merino ewes. Measure and record these lambs for sire, sex, birth type, weights, fat and muscle depth. Slaughter all suitable lambs and measure the carcases for carcase and eating quality traits. Enter lambs and data into the Sheep Genetics database.

3. Increase the accuracy of ASBVs for carcase and eating quality traits of these sires and therefore any animals that are related to them.

4. To collect both direct Intramuscular Fat information and MEQ probe data to allow further validation of abattoir based measurements for future inclusion into the Sheep Genetics analysis.

Methodology

On the 26th August 2022 MLA called for expressions of interest into the "MLA Resource Flock: Satellite Flocks for eating quality and carcase traits – Round 3". In early September the AWSA Federal Council appointed Debbie and Steve Milne, Richmond Hill Agribusiness as Project Managers to assist the AWSA prepare a submission to apply for the MLA project and if the application was successful to coordinate and manage the project.

The project sires were selected by the AWSA Technical committee. Sires were selected that had the most number of progeny in the breed, used in the most number of flocks and were the least related to any sires already used in the MLA Resource Flock. Two link sires were also selected, Detpa Grove 200477 and Langley Heights 190090. These 2 sires were already used in the MLA Resource Flock and had been widely used in the breed.

The Anden family at Willangie in Victoria volunteered to host the project. Each sire was joined by Artificial Insemination to 25 merino ewes. The ewes were an even line of well grown 2 year old maiden commercial ewes, randomly selected for each sire. The lambs had a DNA sample taken at lamb marking for a genomic test and sire identification. The AWSA Technical committee were responsible for final decision making and oversight of the project.

Table 1

Program of events

No	Key event	Timing	Additional comments
1	Select 11 Sires and 2 link sires	Oct-22	AWSA Sub-committee, RHAg and Sheep Genetics
2	AI 325 merino ewes	Jan-23	Host farm – Anden Willangie Vic. Record Ewe EID and joining sire
3	Preg scanning ewes	Apr-23	Record Ewe EID and preg scan result
4	Ewes lamb	Jun-23	Just prior to lambing Ewes separated into two mobs singles and multiples and remain in these two mobs until lamb marking
5	Lamb marking	Jul-23	Tag Lambs, DNA lambs for sire parentage, record birth type (as per lambing mob)
6	Weaning	Sep-23	Record weaning weight
7	EPW Weight, Fat and Muscle Scan	Oct-23	Record EPWT and scan data
8	Pre slaughter weight	Oct-23	Record pre slaughter weight
9	Lambs slaughtered	Oct-23	UNE meat science team - carcase and eating quality measurements in abattoir and later laboratory analysis
10	Data Submission to Sheep Genetics	Sep and Nov 2023 and Jan 2024	Submit on farm progeny measurements in September and November and carcase and meat science data in January 2024
11	Report to AWSA	Regular updates	Reports to Federal council and AWSA membership

Results

Sire Selection

Table 2

Sires – Flock numbers and progeny numbers in Sheep Genetics

Sire		SGID	1/11/2022		1/02/2024	
			Flocks	Progeny	Flocks	Progeny
Link Sire	**DETPA GROVE-200477**	2300432020200477	6	230	13	592
Link Sire	**LANGLEY HEIGHTS-190090**	2300022019190090	7	261	10	409
Sire	**ASHMORE-210064**	2300992021210064	1	53	7	251
Sire	**DAYS-190108**	2307362019190108	4	160	5	233
Sire	**FARRER-190001**	2301392019190001	4	470	6	719
Sire	**GEMINI-170470**	2302332017170470	12	541	15	578
Sire	**IDA VALE-194051**	2300362019194051	7	702	9	854
Sire	**LANGLEY HEIGHTS-180231**	2300022018180231	20	1160	30	1714
Sire	**RANGEVIEW-190098**	2308572019190098	3	115	7	508
Sire	**SMITHSTON-200882**	2304642020200882	3	36	5	203
Sire	**VALMA-202189**	2309162020202189	6	466	18	1020
Sire	**WAKELEIGH-200186**	2309412020200186	1	70	3	219
Sire	**WATTLE PARK-180280**	2305392018180280	1	59	3	86
		Total	**75**	**4323**	**131**	**7386**

Lambs per sire

Table 3

Number of lambs per sire

	Sire	Sire SGID	Lambs marked 11/7/23	Lambs weaned 1/9/23	Lambs weighed and scanned 20/10/23	Lambs weighed and sent to GMP 31/10/23 (over 40KG)
Link Sire	**DETPA GROVE-200477**	2300432020200477	21	21	21	20
Link Sire	**LANGLEY HEIGHTS-190090**	2300022019190090	21	21	21	20
Sire	**ASHMORE-210064**	2300992021210064	27	27	27	23
Sire	**DAYS-190108**	2307362019190108	17	17	17	15
Sire	**FARRER-190001**	2301392019190001	26	26	26	25
Sire	**GEMINI-170470**	2302332017170470	29	28	27	23
Sire	**IDA VALE-194051**	2300362019194051	13	13	12	11
Sire	**LANGLEY HEIGHTS-180231**	2300022018180231	25	25	25	24
Sire	**RANGEVIEW-190098**	2308572019190098	22	22	22	19
Sire	**SMITHSTON-200882**	2304642020200882	16	15	15	15
Sire	**VALMA-202189**	2309162020202189	24	24	24	21
Sire	**WAKELEIGH-200186**	2309412020200186	23	23	23	22
Sire	**WATTLE PARK-180280**	2305392018180280	24	24	23	21
		Total	**288**	**286**	**283**	**259**

Traits measured per sire

Table 4

Number of measurements per sire for WWT, IMF and SF5

Sire	1/11/2022			1/11/2023			1/02/2024		
	WWT	IMF	SF5	WWT	IMF	SF5	WWT	IMF	SF5
DETPA GROVE-200477	150	0	0	431	0	0	561	19	19
LANGLEY HEIGHTS-190090	269	0	0	405	0	6	405	20	26
ASHMORE-210064	0	0	0	189	0	0	194	23	23
DAYS-190108	144	0	0	228	0	0	228	15	15
FARRER-190001	493	0	0	814	0	0	832	25	25
GEMINI-170470	685	0	0	747	0	0	747	23	23
IDA VALE-194051	738	0	0	944	0	0	1078	11	11
LANGLEY HEIGHTS-180231	956	0	0	1522	0	0	1826	23	24
RANGEVIEW-190098	117	0	0	375	0	0	506	19	19
SMITHSTON-200882	40	0	0	166	0	0	221	15	15
VALMA-202189	255	0	0	618	0	0	890	21	21
WAKELEIGH-200186	5	0	0	241	0	0	277	22	22
WATTLE PARK-180280	66	0	0	119	0	0	119	21	21
Total	**3918**	**0**	**0**	**6799**	**0**	**6**	**7884**	**257**	**264**

ASBVs and Accuracies – On Farm measured Traits

Table 5

ASBVs and Accuracies for Growth, Fat and Muscle

Analysis Date: 01/11/2022	ASBVs and Accuracy at sire selection											
Name	WWT	WWT Acc	PWT	PWT Acc	PFAT	PFAT Acc	PEMD	PEMD Acc	LEQ	LEQ Acc	TCP	TCP Acc
DETPA GROVE-200477	10.9	96	17.0	95	-0.7	93	2.7	94	155.6	81	161.3	86
LANGLEY HEIGHTS-190090	10.2	96	16.2	96	0.7	95	2.8	96	155.1	74	149.9	81
ASHMORE-210064	9.1	80	15.7	79	0.8	77	4.7	76	167.6	64	164.6	67
DAYS-190108	8.8	95	15.0	95	0.0	95	2.9	95	147.1	76	145.7	82
FARRER-190001	11.9	97	19.2	97	0.2	97	2.7	97	150.8	73	155.7	81
GEMINI-170470	11.5	98	17.8	97	0.5	97	2.7	97	148.7	77	152.5	84
IDA VALE-194051	11.0	98	17.5	98	0.3	98	2.0	98	138.2	81	141.8	87
LANGLEY HEIGHTS-180231	12.1	98	18.1	98	0.5	98	3.8	98	162.4	77	160.5	83
RANGEVIEW-190098	13.7	91	20.0	92	0.3	91	3.6	92	152.4	62	162.4	72
SMITHSTON-200882	11.4	89	17.0	86	-0.6	81	2.1	82	134.5	63	143.9	69
VALMA-202189	11.1	96	17.8	95	0.9	95	4.8	95	164.0	73	164.6	80
WAKELEIGH-200186	11.3	80	18.3	78	-0.5	74	3.5	76	155.7	57	163.4	62
WATTLE PARK-180280	9.2	87	13.9	86	-0.1	84	-0.7	86	124.0	52	124.9	63
Analysis Date: 01/11/2023	ASBVs and Accuracy after WWT, EPWT and EP scan data submitted to LAMBPLAN											
Name	WWT	WWT Acc	PWT	PWT Acc	PFAT	PFAT Acc	PEMD	PEMD Acc	LEQ	LEQ Acc	TCP	TCP Acc
DETPA GROVE-200477	9.1	96	14.8	96	-0.3	95	2.9	96	148.1	61	152.6	73
LANGLEY HEIGHTS-190090	9.7	96	15.6	96	0.7	95	2.6	96	150.8	74	145.7	82
ASHMORE-210064	8.3	94	14.4	92	1.0	87	4.5	88	166.2	63	162.0	71
DAYS-190108	8.2	95	14.6	95	0.0	95	2.9	95	149.2	69	148.9	77
FARRER-190001	11.6	98	18.8	98	0.1	97	2.4	98	148.3	70	153.3	80
GEMINI-170470	11.7	97	17.6	97	0.5	97	2.5	97	149.2	74	153.4	83
IDA VALE-194051	10.9	97	17.4	97	0.2	97	1.7	97	140.1	72	143.9	81
LANGLEY HEIGHTS-180231	11.8	98	17.9	98	0.5	98	3.9	98	163.4	83	161.6	87
RANGEVIEW-190098	13.3	95	20.6	95	0.6	94	3.8	95	157.5	61	164.7	73
SMITHSTON-200882	11.9	94	17.1	93	-0.3	91	2.3	92	136.4	56	146.1	69
VALMA-202189	10.8	97	16.7	97	0.4	96	4.6	97	162.7	71	163.4	78
WAKELEIGH-200186	11.8	94	18.5	88	-0.9	85	3.0	88	151.6	56	161.5	65
WATTLE PARK-180280	9.6	90	15.3	88	0.1	86	-0.9	88	119.2	58	122.2	68
Analysis Date: 01/2/2024	ASBVs and Accuracy after carcase and eating quality data submitted to LAMBPLAN											
Name	WWT	WWT Acc	PWT	PWT Acc	PFAT	PFAT Acc	PEMD	PEMD Acc	LEQ	LEQ Acc	TCP	TCP Acc
DETPA GROVE-200477	9.4	97	15.3	97	-0.5	96	2.8	97	145.2	83	154.2	87
LANGLEY HEIGHTS-190090	9.8	96	15.8	96	0.8	95	2.7	96	145.3	87	143.1	89
ASHMORE-210064	8.4	94	14.4	95	0.6	94	3.9	94	157.0	85	157.3	87
DAYS-190108	8.1	95	14.5	95	0.0	95	3.0	95	150.4	83	151.0	86
FARRER-190001	11.6	98	19.0	98	0.1	98	2.4	98	159.6	87	157.4	91
GEMINI-170470	11.5	97	17.4	97	0.7	97	2.4	97	147.5	87	148.6	91
IDA VALE-194051	10.8	98	17.2	98	0.3	97	1.8	98	132.8	83	144.2	88
LANGLEY HEIGHTS-180231	11.3	98	17.9	98	0.7	98	3.9	98	167.9	92	159.1	93
RANGEVIEW-190098	12.5	96	18.9	96	0.3	96	3.6	96	165.2	83	164.5	87
SMITHSTON-200882	11.8	95	17.6	94	-0.2	94	2.4	94	155.3	80	155.6	84
VALMA-202189	11.2	98	17.8	98	0.7	98	4.7	98	155.3	88	164.5	90
WAKELEIGH-200186	11.9	94	18.0	92	-1.1	91	2.8	92	153.0	82	162.7	85
WATTLE PARK-180280	9.5	91	15.6	89	0.2	87	-1.0	88	109.2	81	116.1	84

ASBVs and Accuracies – Hard to Measure traits

Table 6

ASBVs and Accuracies for Carcase and Eating Quality

Analysis Date: 01/11/2022	ASBVs and Accuracy at sire selection											
Name	LMY	LMY Acc	IMF	IMF Acc	SF5	SF5 Acc	D%	D% Acc	LEQ	LEQ Acc	TCP	TCP Acc
DETPA GROVE-200477	4.6	89	-0.5	82	-0.1	82	2.9	86	155.6	81	161.3	86
LANGLEY HEIGHTS-190090	2.4	88	0.1	73	-2.0	72	2.6	81	155.1	74	149.9	81
ASHMORE-210064	3.5	72	0.0	67	-1.3	67	3.6	69	167.6	64	164.6	67
DAYS-190108	2.8	87	-0.1	76	-2.0	76	2.4	82	147.1	76	145.7	82
FARRER-190001	3.4	87	-0.3	72	-0.5	72	3.0	81	150.8	73	155.7	81
GEMINI-170470	3.1	90	-0.3	77	1.2	77	2.7	84	148.7	77	152.5	84
IDA VALE-194051	2.7	92	-0.2	81	2.3	81	2.5	86	138.2	81	141.8	87
LANGLEY HEIGHTS-180231	3.4	90	0.1	73	-0.9	74	3.3	83	162.4	77	160.5	83
RANGEVIEW-190098	4.9	80	-0.7	63	2.9	62	3.6	73	152.4	62	162.4	72
SMITHSTON-200882	4.2	76	-0.7	65	3.1	65	2.3	70	134.5	63	143.9	69
VALMA-202189	3.8	86	0.0	73	-0.2	73	3.8	80	164.0	73	164.6	80
WAKELEIGH-200186	4.5	68	-0.4	61	-0.7	60	3.3	64	155.7	57	163.4	62
WATTLE PARK-180280	1.2	72	0.1	54	-0.9	52	0.8	64	124.0	52	124.9	63
Analysis Date: 01/11/2023	ASBVs and Accuracy after WWT, EPWT and EP scan data submitted to LAMBPLAN											
Name	LMY	LMY Acc	IMF	IMF Acc	SF5	SF5 Acc	D%	D% Acc	LEQ	LEQ Acc	TCP	TCP Acc
DETPA GROVE-200477	3.4	85	-0.4	61	-0.6	60	2.7	72	148.1	61	152.6	73
LANGLEY HEIGHTS-190090	2.1	87	0.0	69	-0.8	75	2.4	80	150.8	74	145.7	82
ASHMORE-210064	2.9	79	0.2	63	-2.5	63	3.1	72	166.2	63	162.0	71
DAYS-190108	2.7	85	-0.2	69	-1.5	68	2.4	78	149.2	69	148.9	77
FARRER-190001	3.2	87	-0.3	68	0.7	69	2.8	80	148.3	70	153.3	80
GEMINI-170470	3.0	90	-0.2	74	0.8	75	2.7	84	149.2	74	153.4	83
IDA VALE-194051	2.5	89	-0.2	71	1.9	71	2.4	82	140.1	72	143.9	81
LANGLEY HEIGHTS-180231	3.4	93	0.0	79	-0.8	80	3.4	88	163.4	83	161.6	87
RANGEVIEW-190098	4.6	82	-0.4	61	1.6	60	4.0	73	157.5	61	164.7	73
SMITHSTON-200882	4.2	78	-0.7	56	2.8	55	2.3	70	136.4	56	146.1	69
VALMA-202189	4.1	87	-0.2	67	0.6	68	3.3	78	162.7	71	163.4	78
WAKELEIGH-200186	5.0	78	-0.5	59	0.9	58	3.1	67	151.6	56	161.5	65
WATTLE PARK-180280	0.5	77	-0.1	61	-0.9	59	0.6	68	119.2	58	122.2	68
Analysis Date: 01/2/2024	ASBVs and Accuracy after carcase and eating quality data submitted to LAMBPLAN											
Name	LMY	LMY Acc	IMF	IMF Acc	SF5	SF5 Acc	D%	D% Acc	LEQ	LEQ Acc	TCP	TCP Acc
DETPA GROVE-200477	4.0	88	-0.9	88	1.3	84	2.5	85	145.2	83	154.2	87
LANGLEY HEIGHTS-190090	2.4	89	-0.2	89	0.1	87	2.0	87	145.3	87	143.1	89
ASHMORE-210064	3.1	84	-0.4	89	0.4	85	3.6	85	157.0	85	157.3	87
DAYS-190108	2.7	86	-0.3	87	-0.8	83	2.9	85	150.4	83	151.0	86
FARRER-190001	2.9	91	0.3	90	-1.6	87	3.0	90	159.6	87	157.4	91
GEMINI-170470	2.4	92	0.1	91	-0.5	88	2.4	90	147.5	87	148.6	91
IDA VALE-194051	3.0	91	-0.9	86	3.1	83	2.4	87	132.8	83	144.2	88
LANGLEY HEIGHTS-180231	3.2	95	0.7	92	-1.6	90	3.6	93	167.9	92	159.1	93
RANGEVIEW-190098	4.1	86	0.3	88	-1.0	84	3.1	85	165.2	83	164.5	87
SMITHSTON-200882	3.8	82	0.1	86	0.0	80	3.1	81	155.3	80	155.6	84
VALMA-202189	4.5	91	-0.7	90	2.9	86	3.8	88	155.3	88	164.5	90
WAKELEIGH-200186	5.4	83	-0.5	89	0.2	84	1.8	83	153.0	82	162.7	85
WATTLE PARK-180280	0.3	80	-0.5	88	0.1	84	0.7	81	109.2	81	116.1	84

Accuracy Changes

Note Sheep Genetics advised in the 2023 Analysis Enhancements Booklet –

"**Enhancement 5 – Updated accuracy calculation** *The calculation of ASBV accuracy was updated for the Maternal and Terminal analyses as part of a large-scale updates during the 2022 analysis enhancements. As part of the work undertaken for the 2023 analysis enhancements, a coding error was discovered which resulted in some animals having inflated accuracy values. This error will be fixed and released as part of the 2023 Analysis Enhancements. As a result, there will be an overall reduction in reported accuracy values for the main traits in the Maternal and Terminal analyses. Animals with a genotype will be more impacted by reduced accuracy values compared to non-genotyped animals. Please note that this change will not impact ASBV or index values."*

As a result of the changes above implemented on the 1st June 2023 the following accuracy comparisons have been made between the analysis dates 1/11/23 and 1/2/24. This is after the above enhancements have been made to ensure a consistent comparison.

Accuracy comparison Growth and Muscle

Table 7

Accuracy comparison Growth and Muscle

Sire	1/11/22 WWT Acc	1/11/23 WWT Acc	1/02/24 WWT Acc	Change in WWT Acc*	1/11/22 PEMD Acc	1/11/23 PEMD Acc	1/02/24 PEMD Acc	Change in PEMD Acc*
DETPA GROVE-200477	96	96	97	1	94	96	97	1
LANGLEY HEIGHTS-190090	96	96	96	0	96	96	96	0
ASHMORE-210064	80	94	94	0	76	88	94	6
DAYS-190108	95	95	95	0	95	95	95	0
FARRER-190001	97	98	98	0	97	98	98	0
GEMINI-170470	98	97	97	0	97	97	97	0
IDA VALE-194051	98	97	98	1	98	97	98	1
LANGLEY HEIGHTS-180231	98	98	98	0	98	98	98	0
RANGEVIEW-190098	91	95	96	1	92	95	96	1
SMITHSTON-200882	89	94	95	1	82	92	94	2
VALMA-202189	96	97	98	1	95	97	98	1
WAKELEIGH-200186	80	94	94	0	76	88	92	4
WATTLE PARK-180280	87	90	91	1	86	88	88	2
		Average increase		0.5		Average increase		1.4

*** Comparison is between 1/11/23 and 1/2/24, see note above.**

Accuracy comparison Eating Quality

Table 8

Accuracy comparison Intramuscular Fat (IMF) and Shear Force (SF5)

Sire	1/11/22	1/11/23	1/02/24	Change in IMF Acc*	1/11/22	1/11/23	1/02/24	Change in SF5 Acc*
	IMF Acc	IMF Acc	IMF Acc		SF5 Acc	SF5 Acc	SF5 Acc	
DETPA GROVE-200477	82	61	88	27	82	60	84	24
LANGLEY HEIGHTS-190090	73	69	89	20	72	75	87	12
ASHMORE-210064	67	63	89	26	67	63	85	22
DAYS-190108	76	69	87	18	76	68	83	15
FARRER-190001	72	68	90	22	72	69	87	18
GEMINI-170470	77	74	91	17	77	75	88	13
IDA VALE-194051	81	71	86	15	81	71	83	12
LANGLEY HEIGHTS-180231	73	79	92	13	74	80	90	10
RANGEVIEW-190098	63	61	88	27	62	60	84	24
SMITHSTON-200882	65	56	86	30	65	55	80	25
VALMA-202189	73	67	90	23	73	68	86	18
WAKELEIGH-200186	61	59	89	30	60	58	84	26
WATTLE PARK-180280	54	61	88	27	52	59	84	25
		Average increase		22.7		Average increase		18.8

*** Comparison is between 1/11/23 and 1/2/24, see note above.**

Accuracy comparison Indexes

Table 9

Accuracy comparison TCP and LEQ

Sire	1/11/22	1/11/23	1/02/24	Change in TCP Acc*	1/11/22	1/11/23	1/02/24	Change in LEQ Acc*
	TCP Acc	TCP Acc	TCP Acc		LEQ Acc	LEQ Acc	LEQ Acc	
DETPA GROVE-200477	86	73	87	14	81	61	83	22
LANGLEY HEIGHTS-190090	81	82	89	7	74	74	87	13
ASHMORE-210064	67	71	87	16	64	63	85	22
DAYS-190108	82	77	86	9	76	69	83	14
FARRER-190001	81	80	91	11	73	70	87	17
GEMINI-170470	84	83	91	8	77	74	87	13
IDA VALE-194051	87	81	88	7	81	72	83	11
LANGLEY HEIGHTS-180231	83	87	93	6	77	83	92	9
RANGEVIEW-190098	72	73	87	14	62	61	83	22
SMITHSTON-200882	69	69	84	15	63	56	80	24
VALMA-202189	80	78	90	12	73	71	88	17
WAKELEIGH-200186	62	65	85	20	57	56	82	26
WATTLE PARK-180280	63	68	84	16	52	58	81	23
		Average increase		11.9		Average increase		17.9

*** Comparison is between 1/11/23 and 1/2/24, see note above.**

Discussion

The number of flocks and progeny recorded in Sheep Genetics at the start of the project and entered during the project per sire are shown in **Table 2**. As can be seen from the numbers, not only was data entered for the lambs by sires from the Satellite flock but additional information from other flocks was also added during the project. The number of lambs per sire at each stage of the project is summarised in **Table 3**. At each stage, there were sufficient numbers of lambs per sire for the project.

The number of measurements per sire recorded in Sheep Genetics per trait was recorded for the duration of the project as shown in **Table 4. T**he number of actual measurements for carcase and eating quality traits has increased significantly for all the project sires. At the start of the project the link sires were recorded as being in the MLA Resource Flock as indicated on the Sheep Genetics web site. It was therefore expected they would have had carcase and eating quality measurements on their lambs included in the analysis by the start of the project. It has been discovered that these two sires did not have any IMF information and Langley Heights 190090 had only 6 records of SF5 that were included in the 1/11/23 analysis. Langley Heights 190090 was part of the 2021 Resource Flock and Detpa Grove 200477 was part of the 2022 Resource Flock. It is very disappointing that the carcase and eating quality data from these Resource Flocks for these link sires has not yet been included in the analysis (apart from the abovementioned 6 SF5 records).

The ASBVs and accuracies at each stage of the project are shown in **Tables 5** and **6**. The first section of each table (Analysis date 1/11/2022) shows the ASBVs and accuracies per sire at the start of the project. Analysis date 1/11/2023 shows the ASBVs and accuracies per sire after the on farm measurements of the lambs for WWT, EPWT and fat and muscle scans were included in the analysis. The third section of each table (Analysis date 1/2/24) shows the ASBVs and their accuracies after the carcase and eating quality measurements were included in the analysis. The results shown in these tables illustrate clearly that as more data is included the accuracies increase. It also shows that the ASBVs may change as more information is included in the analysis.

Accuracy comparisons are shown in **Tables 7, 8** and **9.** These comparisons are between the analyses dated 1/11/23 and 1/2/24 with the latter including the carcase and eating quality measurements. A comparison from the start of the project was not possible due to the change in the accuracy calculations that took effect on the 1st June 2023 (see the "Note" in Accuracy Changes). These accuracy calculation changes are not likely to have significantly affected the results. This is supported by the minimal change in accuracies for Growth and Muscle traits shown in **Table 7**.

Table 7 shows the changes in accuracy for WWT and PEMD as representative of the traits typically measured 'on farm'. As expected, the inclusion of genomic, carcase and eating quality information has had little effect on accuracy of these 'on farm' measured traits. A minimal increase in accuracy on average of 0.5 for WWT and 1.4 for PEMD is in line with expectations and the results from the AWSA Satellite Flock Project 1.

A more significant increase in accuracy is shown in **Table 8** which shows the changes in ASBV accuracy for the eating quality traits Intra-muscular Fat (IMF) and Shear Force (SF5). As can be seen the average increase in accuracy of these ASBVs for these sires is 22.7% for IMF and 18.8% for SF5.

These increases can be directly attributed to the inclusion of phenotypic measurements of these traits being included in the February the 1st analysis.

The comparison of accuracies for the TCP and LEQ indexes is shown in **Table 9**. Again the increases are significant, with the accuracy of the TCP index for these sires increasing by an average of 11.9% and that of LEQ by 17.9%. The larger average increase in the accuracy of the LEQ index can be attributed to the greater influence eating quality traits have on the makeup of that index. The result is again consistent with the effect of the inclusion of phenotypic measurements for these eating quality traits in the February 1 analysis.

Loading lambs for Gundagai

Conclusion

Objectives

1. *Increase the number of White Suffolk sires represented in the Resource and Satellite Flocks to broaden the footprint within the breed of animals with phenotypic information for eating quality traits.*

   The project selected 11 sires that were, or were to be, widely used in the White Suffolk breed, had not been used in the MLA Resource Flock and had the least relationship to sires already in the Resource Flock. In addition 2 sires that had been used in the Resource Flock were chosen to provide linkage between this flock and the Resource Flock population. As stated previously, the carcase and eating quality data for these link sires has not been finally submitted to the Sheep Genetics database and so the linkage to the Resource Flock is limited at this stage.
   The sires used in this project (including the link sires) have now been used in 131 LAMBPLAN recorded flocks, with a total of 7386 recorded progeny. The objective of broadening the footprint of phenotypic eating quality information has certainly been achieved with a total of 515 IMF and Shear Force measurements added to the database from this project.

2. *Join the selected sires to an even line of commercial merino ewes. Measure and record these lambs for sire, sex, birth type, weights, fat and muscle depth. Slaughter all suitable lambs and measure the carcases for carcase and eating quality traits. Enter lambs and data into the Sheep Genetics database.*

   The project completed a successful AI program in January 2023 and marked 288 lambs in July 2023. Of those lambs 286 were weaned (WWT recorded) and 283 were scanned and weighed at Early Post Weaning. In early November, 259 lambs were slaughtered at Gundagai Meat Processors (GMP) and carcase and eating quality traits were collected both in the abattoir and by the UNE Meat science team in the laboratory in Armidale.
   All genomic and pedigree information, and the phenotypic data collected on farm, in the abattoir and in the laboratory was submitted to Sheep Genetics.

3. *Increase the accuracy of ASBVs for carcase and eating quality traits of these sires and therefore any animals that are related to them.*

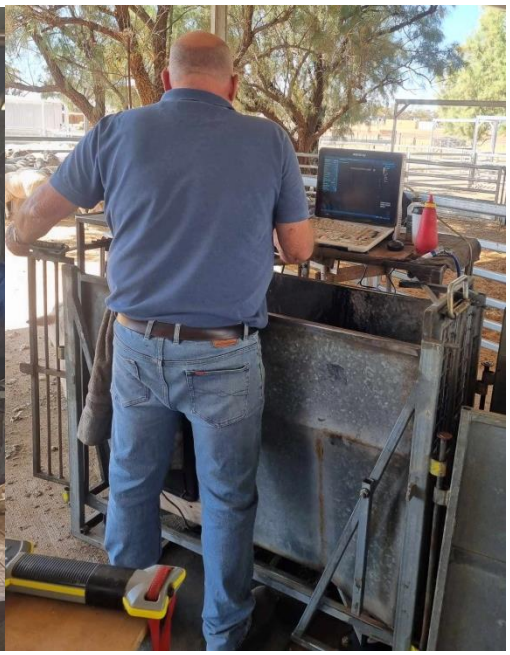
   The accuracy of carcase and eating quality traits targeted by this project has significantly increased for the 11 selected sires and the 2 link sires and therefore for those animals closely related to them. The lack of eating quality data for the link sires means that their accuracy for these traits has increased by a greater degree than expected. However, this will also benefit the breed as they have a significant number of progeny.

4. *To collect both direct Intramuscular Fat information and MEQ probe data to allow further validation of abattoir based measurements for future inclusion into the Sheep Genetics analysis.*

   By having the lambs slaughtered at GMP, we were able to collect MEQ Probe data in the abattoir as well as collecting SOMA and NIR IMF data in the laboratory. This information has been provided to Sheep Genetics to further validate the use of information collected in the abattoir for the genetic evaluation of eating quality traits.

DNA sampling at marking

Clean up for AI



Fat and muscle scanning

Lambs drafted for loading

Sponsors

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- **Meat and Livestock Australia.**

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