



Proof of Concept
Lean Meat Yield and Eating Quality
Producer Demonstration Sites

Lamb consumers want

- Juiciness, flavour
 - Influenced by intramuscular fat
 - Ideal 4-6%
 - Range = 2 – 9.8%
- Tenderness
 - Objective measure is shear force
 - Below 40N is considered acceptable
- More meat, less fat
 - Improve LMY



LMY maximises profits along the whole supply chain

LMY affects value and efficiency

- Consumer
 - Wants value for \$\$\$
- Processor
 - Paying meat price for fat
 - Less meat to sell
 - Extra cost of trim = labour, disposal
- Very important for farm profitability
 - Score 2 to 4 =extra 40kg of feed
 - Grow muscle not fat



More meat, less fat = Increase lean meat yield

Score 4

Carcase Wt 23.0 kg

GR 20.0 mm

Saleable Meat Yield
47.2%

900g more fat



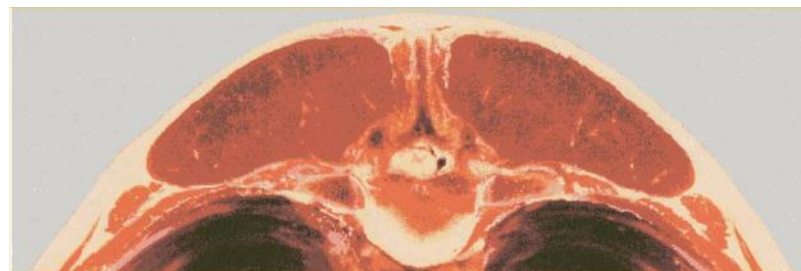
Score 2

Carcase Wt 23.0 kg

GR 10.0 mm

Saleable Meat Yield
51.1%

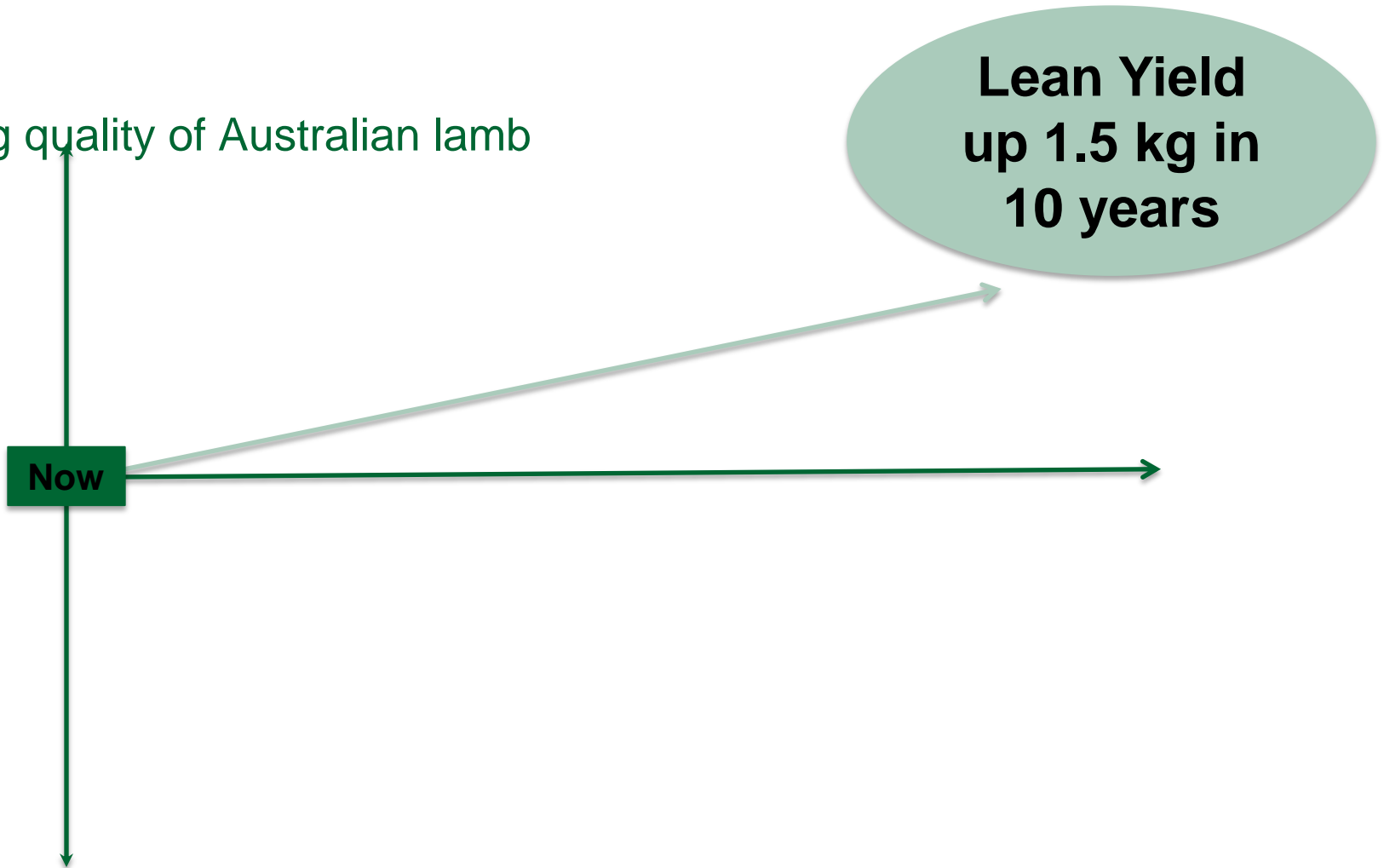
900g more meat



The challenge



Eating quality of Australian lamb



Genetic correlations between hard to measure traits

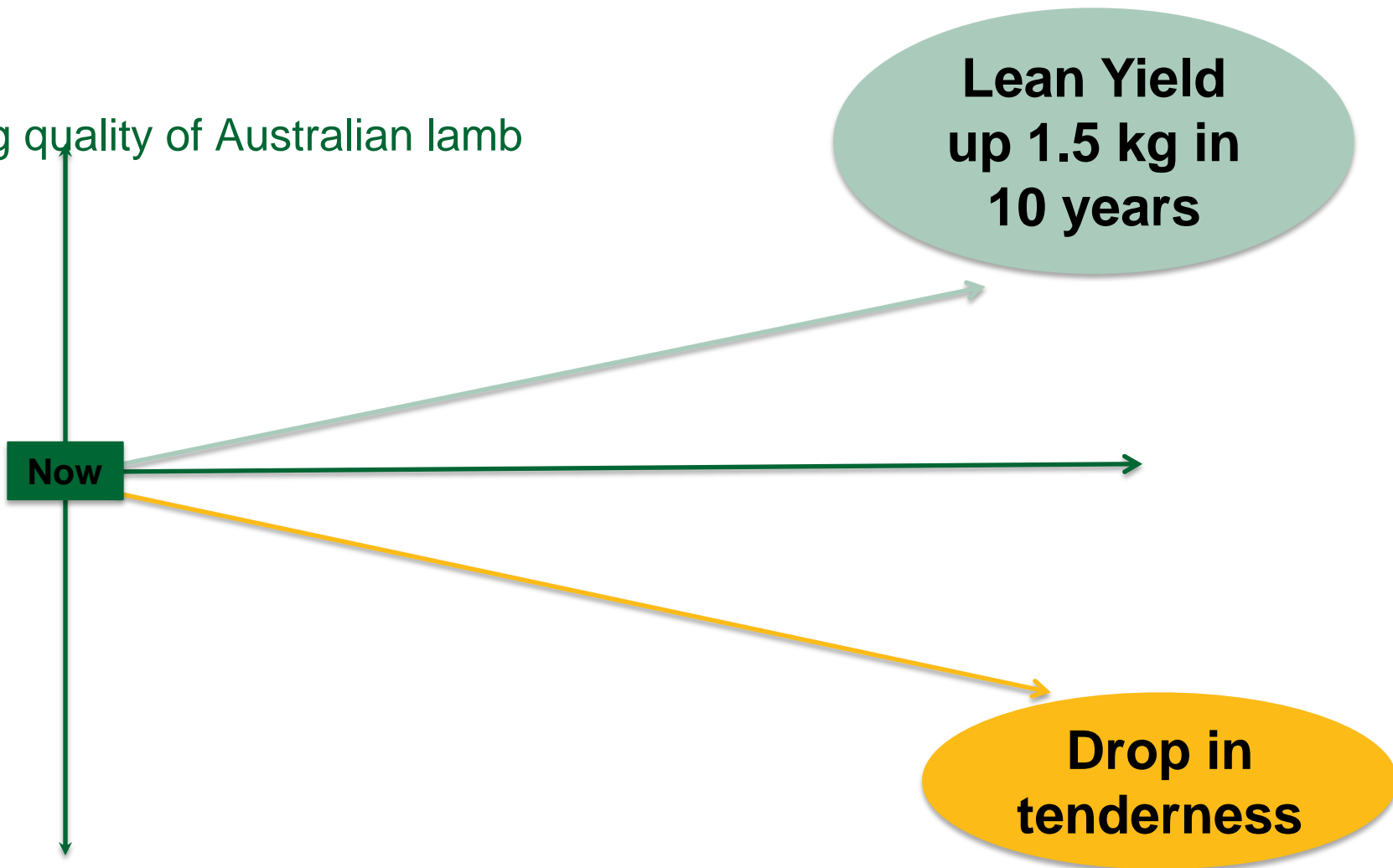
- ↑ IMF ↑ tenderness (high) ✓
- ↑ LMY ↓ IMF (high) ✗
- ↑ LMY ↓ tenderness (moderate) ✗

LMY = lean meat yield; IMF = intramuscular fat

The challenge



Eating quality of Australian lamb



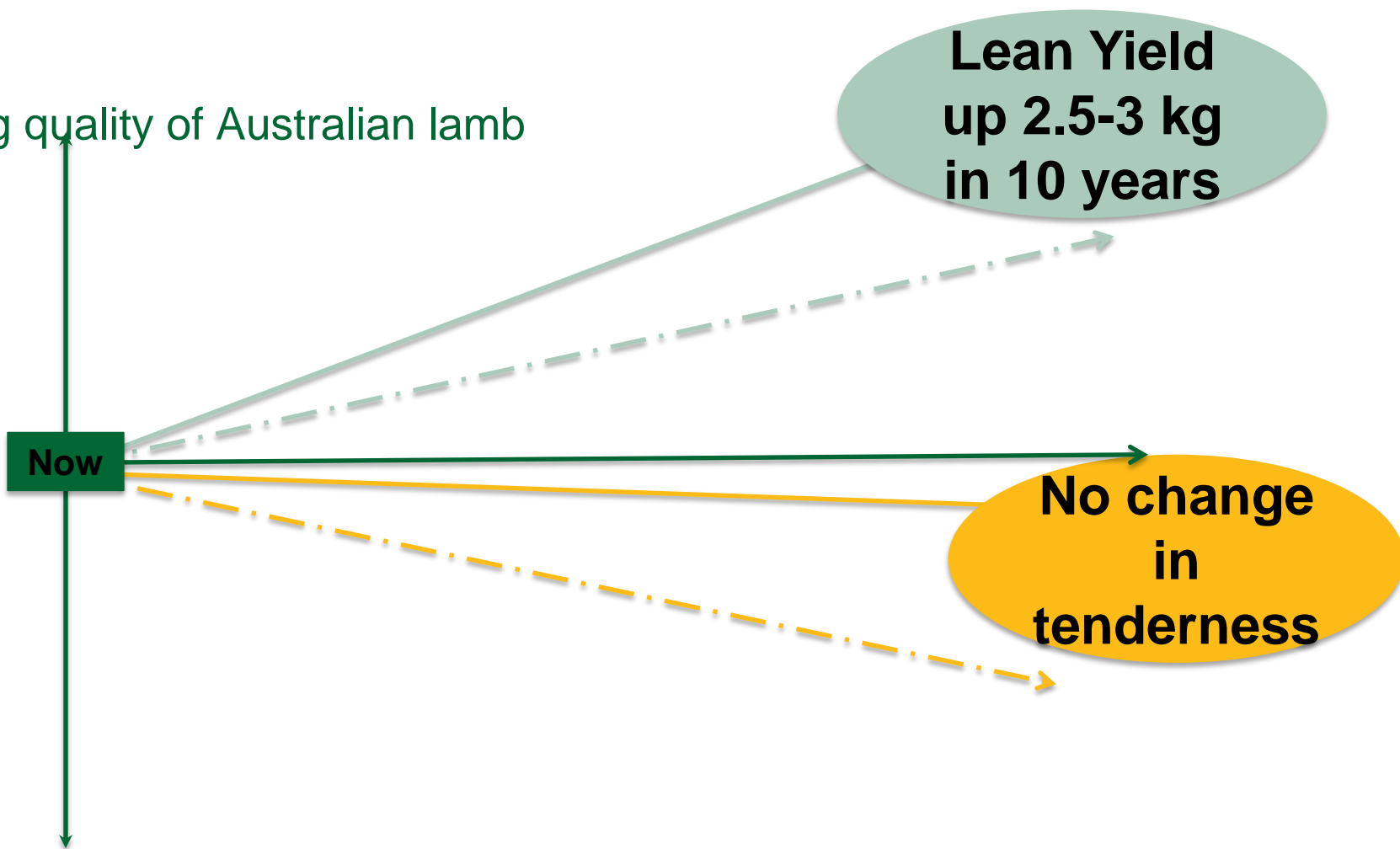
So single focused selection on LMY will:

- Increase shear force (tougher)
- Reduce intramuscular fat (less juicy, less flavour & tougher)
- **BUT** LMY is important for lamb

The challenge

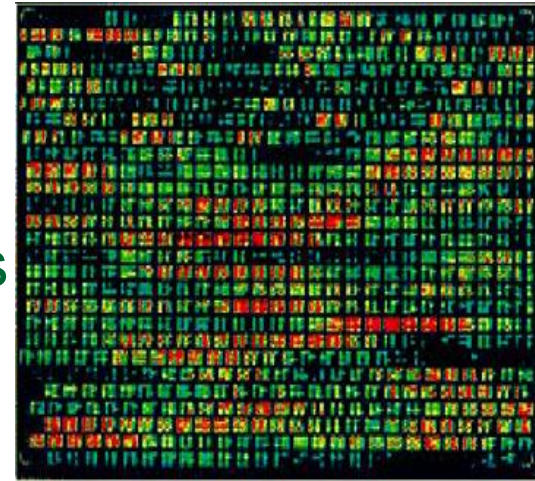


Eating quality of Australian lamb



Hard to measure traits

- Blood sample and relatives measurements to describe a rams genotype
- Used to develop genomic breeding values
- These new breeding values are currently called research breeding values (RBV's)



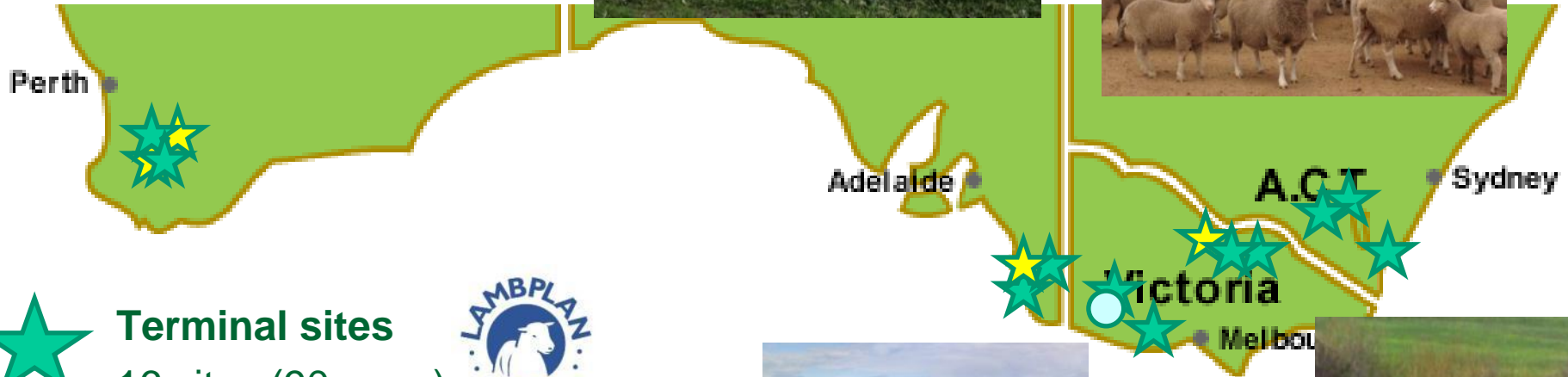
<u>Animal ID</u>	<u>BWT</u>	<u>WWT</u>	<u>PWT</u>	<u>PFAT</u>	<u>PEMD</u>	<u>PWEC</u>	<u>Carcase Plus</u>	<u>Trade\$</u>	<u>LMY RBV</u>	<u>IMF RBV</u>	<u>SHEARF5 RBV</u>
GLOROY-070100 <small>CRC</small>	0.41 93%	8.2 96%	11.2 96%	0.1 96%	1.8 97%	26 84%	178 96%	110.1 90%	1.01 66%	-0.41 71%	0.6 65%


EQ LMY Project aims

- Proof of concept project
- Validate Research Breeding Values (RBV) for LMY & EQ
 - on-farm
 - multiple environments
 - multiple supply chains



Multiple environments



 **Terminal sites**
16 sites (90 rams)



 **Merino sites**
4 sites (30 rams)



12 processing plants, 7 supply chains

Supply chains and processors

- Australian Lamb Company P/L
- Coles
- Frewstal Pty Ltd
- **GM Scott Pty Ltd**
- Gundagai Meat Processors
- JBS Australia Pty Ltd
- Thomas Food International
- V & V Walsh
- WAMMCO Ltd
- **Woolworths**

Ewe & AI Management

- Ewe selection
 - Mature first cross ewes
 - WEC test & drench as required
 - Managed to LTEM guidelines



Ram selection

- Poll Dorset & White Suffolk
 - DNA & progeny tested for new traits
 - Selected for extreme traits

	LMY	SF5	IMF	HCWT	DP %
Ram 1	1.03		-0.42		0.38
Ram 2		3.07		0.68	0.67
Ram 3	1.06	3.89	-0.42		-0.50
Ram 4				0.41	
Ram 5	-1.26	-2.24	0.62		
Ram 6	-1.26			-0.83	
Ram 7		-2.68	0.79		
Ram 8		-2.39			-0.52

Live Results

Activity	Timing	Result
AI	March 2013	317 ewes FS = 3.1
Scanning	June 2013	60% pregnant (190 ewes) 38% single 62% multiple
Lambing	August 2013	89.5% survival
Weaning	Nov 2013	275 lambs weaned 35.1kg average (16.6-46.2kg)
Weight	9 Dec 2013	40.6kg (23.6-52.5kg)
Slaughter	16 Dec 2013 (55 lambs)	49.5kg
Slaughter	30 Jan 2014 (166 lambs)	45.2kg



Effect of sire RBVs on finishing

	SF5 RBV	IMF RBV	LMY RBV	First draft	Light
Ram 1				29%	17%
Ram 2				16%	19%
Ram 3				17%	20%
Ram 4				21%	21%
Ram 5				34%	10%
Ram 6				11%	29%
Ram 7				22%	27%
Ram 8				19%	15%

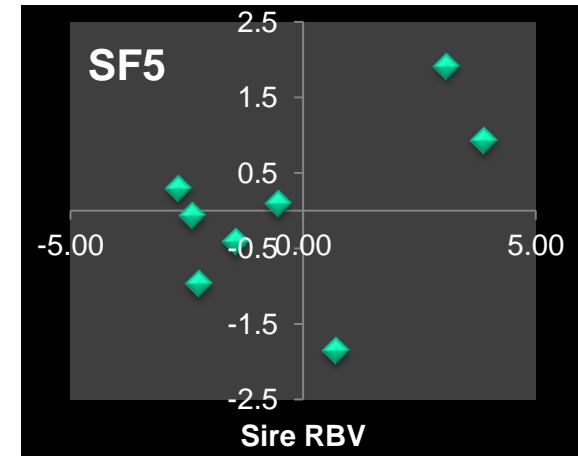
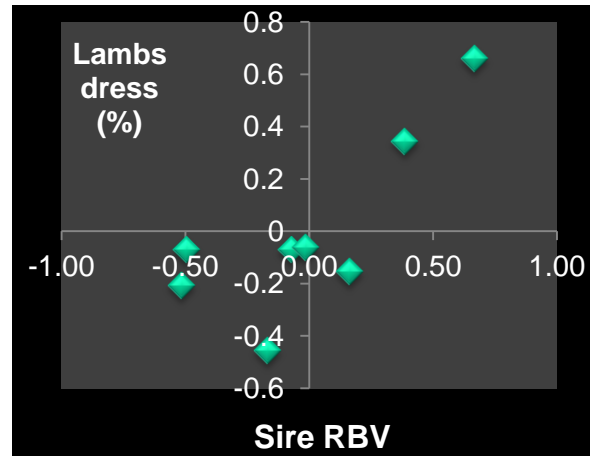
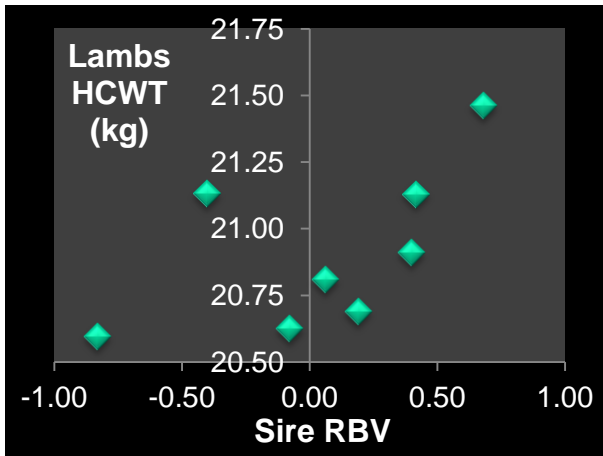
Average carcasse results

	Dec lambs	Jan lambs	Sex	BT
Weight	49.5kg	45.2kg	1>2	M>F
Dressing	43%	45%	1>2	M<F
HCWT	21.4kg	20.5kg	1>2	M>F
C fat	3.2mm	3.8mm	1=2	M>F
EMD	33mm	30mm	1=2	M=F
LMY	59%	59%	1=2	M>F
SF5 (tenderness)	32N	28N	1=2	M=F
IMF	3.9%	4.0%	1=2	M=F



Relationship between predicted and actual lamb performance

HCWT	Dressing %	CCFAT	LMY	SF5	IMF
OK	Good	Good	Poor	OK	Poor



Conclusion

- Measurable differences between sires in progeny carcass and eating quality traits
- No negative effect on progeny performance when using sires with desirable carcass traits
- Further analysis still required to refine relationships between RBVs and progeny performance.

Summary

- Project working across the whole supply chain
- Profit and sustainability of everybody in the Australian lamb industry.



Acknowledgements



- 20 PDS Hosts and numerous ram breeders
- 9 site facilitators (2 Dept of Ags, 1 University, 4 private companies)
- 3 Lamb Supply Chain Officers
- 7 supply chains
- 12 processing plants
- 4 slaughter measurement/sampling teams
- 5 laboratories
- Sheep Genetics
- MLA

Sponsorship from private
agribusinesses