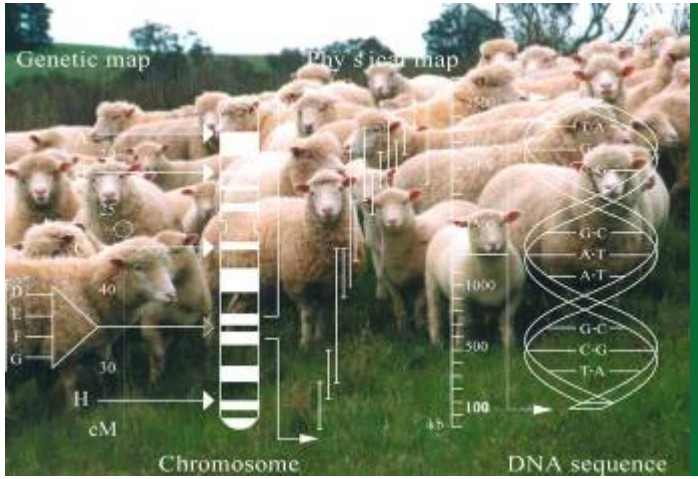


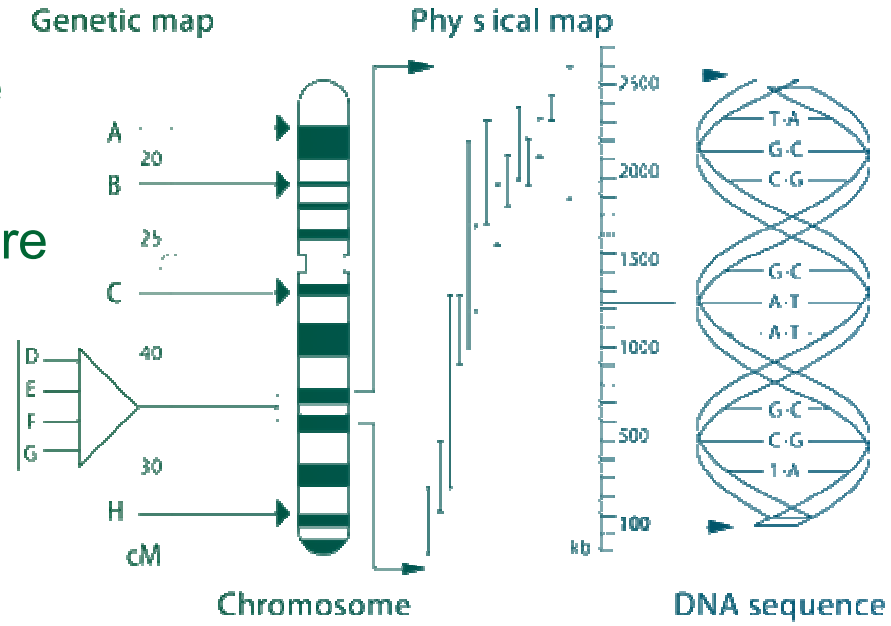
Meating the challenge – genetics

Dr Alex Ball

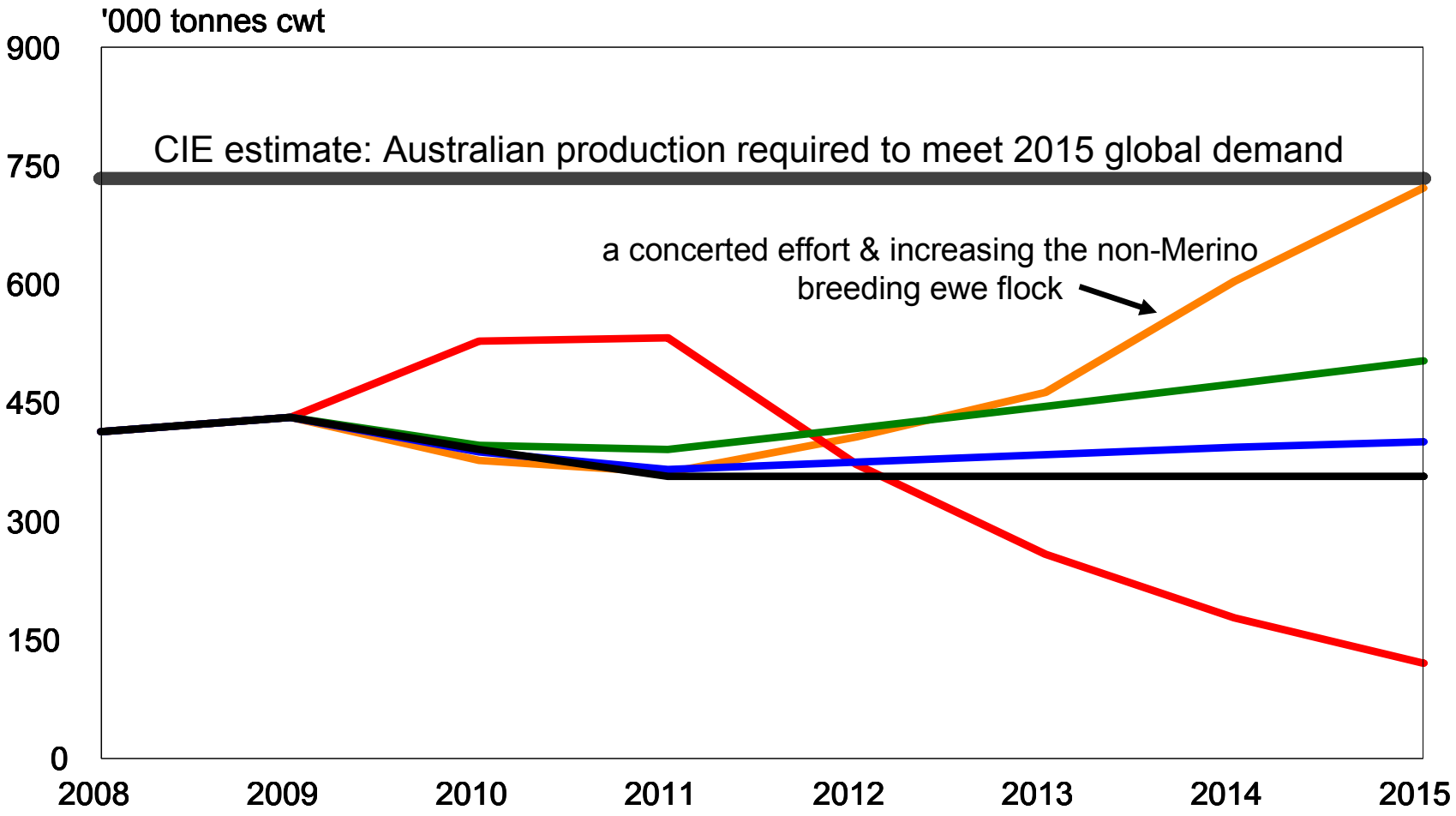
Meat & Livestock Australia

Genetic potential

- Genetics has and will lead change
- We must focus on traits of the future
- We must watch the correlations
- Time for OVERDRIVE



Realising the potential – what will it take?

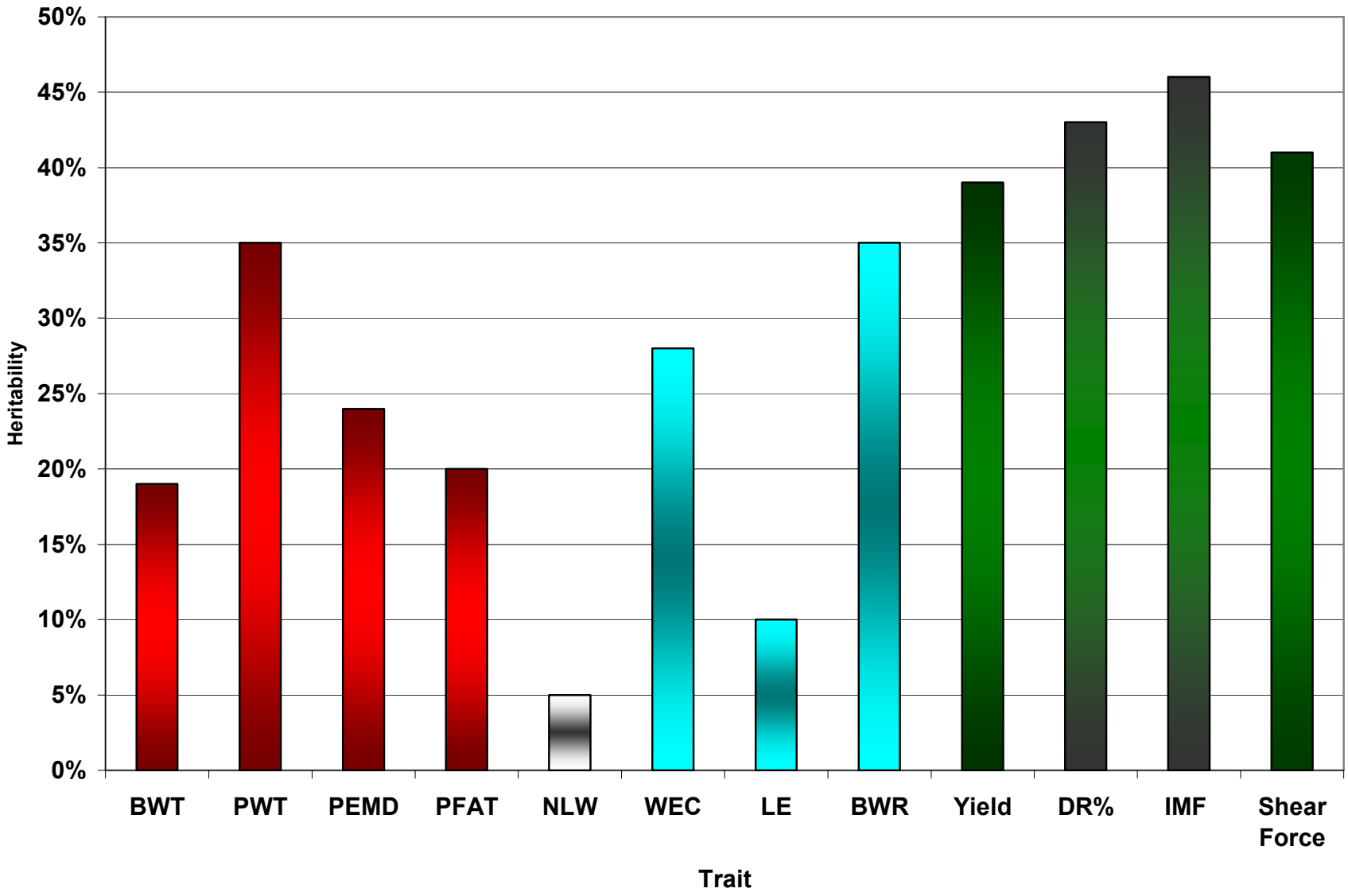


Source: CIE, MLA

The future for genetics and sheepmeat

- Growth rate and carcase weight is fundamental and locked in
- Reproductive rate is a challenge
- Lambing ease, worm egg count and carcase traits will emerge as must haves
- Eating quality and nutrient value will be the new points of differentiation

Heritability of key meat traits



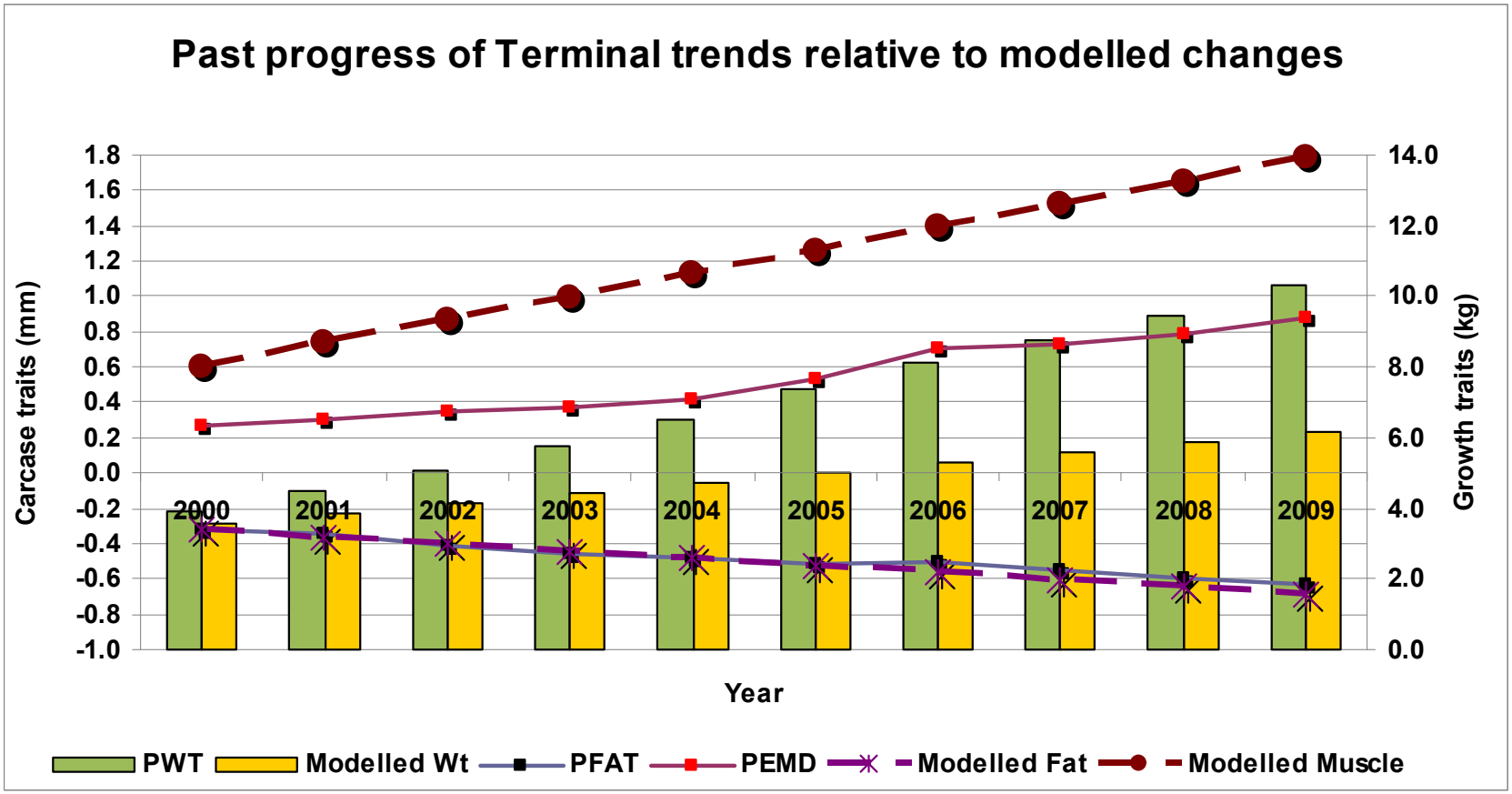
Impact on carcase traits
(genetic correlations)

Trait	PWT	PFAT	PEMD
Carcase weight	0.92		
Fat GR	-0.49	0.37	-0.49
Dressing %	0.27	0.58	
Lean meat yield		-0.64	
Loin weight	0.27		0.43
Loin fat		0.84	

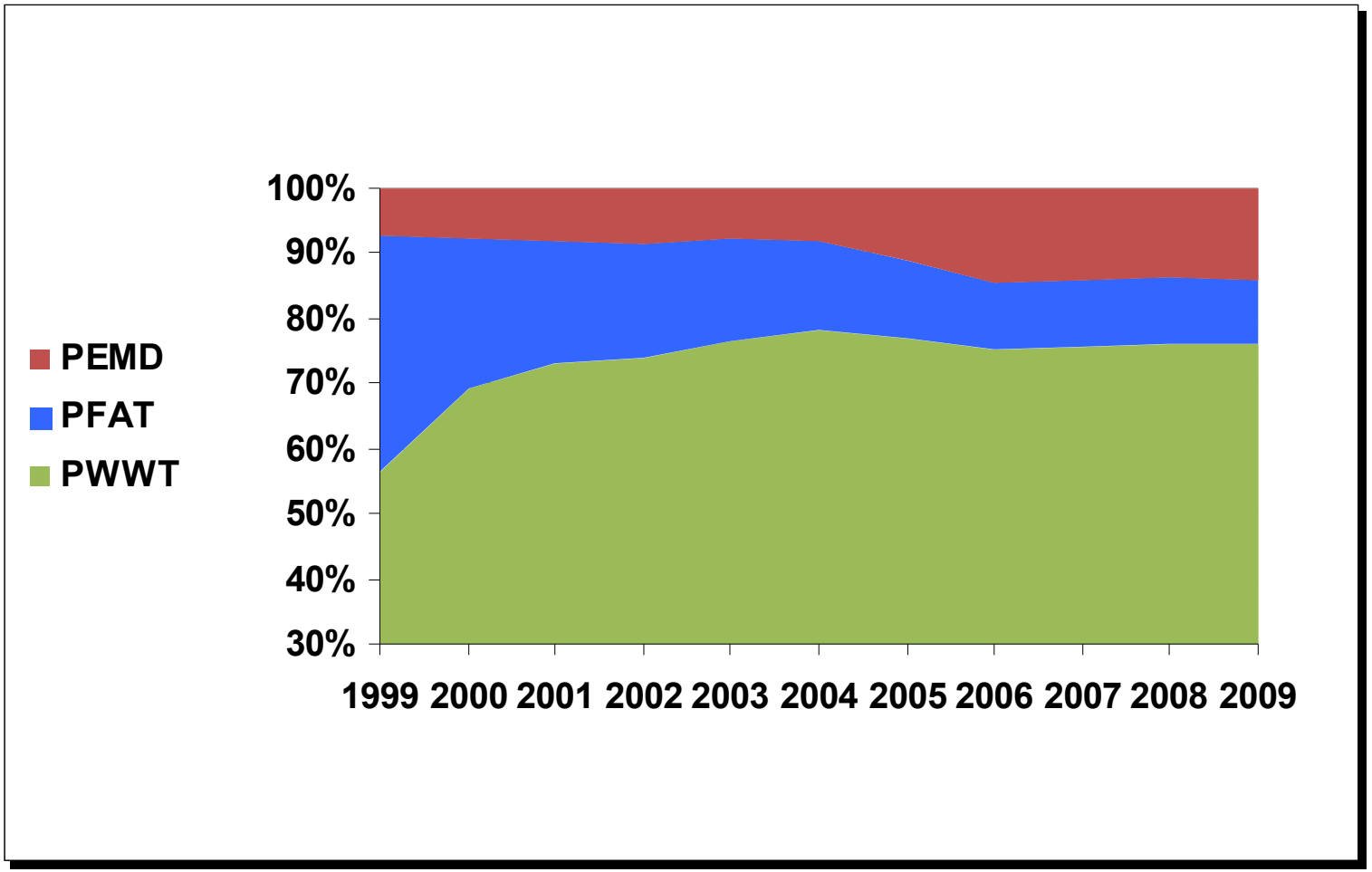
The industry challenge

- Increase:
  - carcase weight by 0.6kg per year
  - reproductive rate by 2% per year
  - lean meat yield
- Maintain or improve eating quality
- Reduce worms and maintain lambing ease

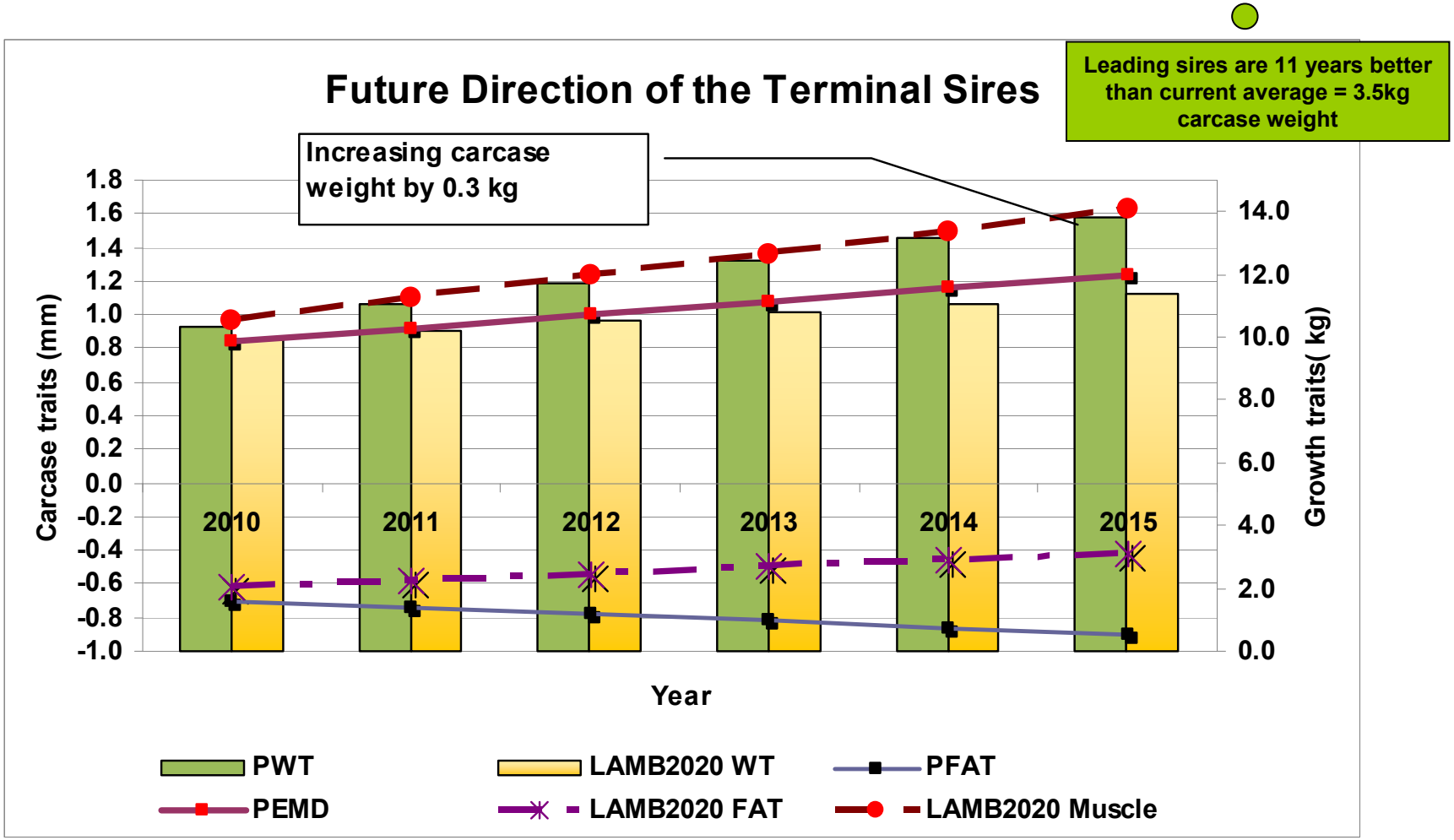
Terminal genetic trends



Terminal sire relative selection emphasis



The terminal sire future



Maternal genetics blueprint

Weaning %
NLW, LE,
BWT

Growth rate
WWT, PWT

Carcase $$
PFAT, PEMD
LMY

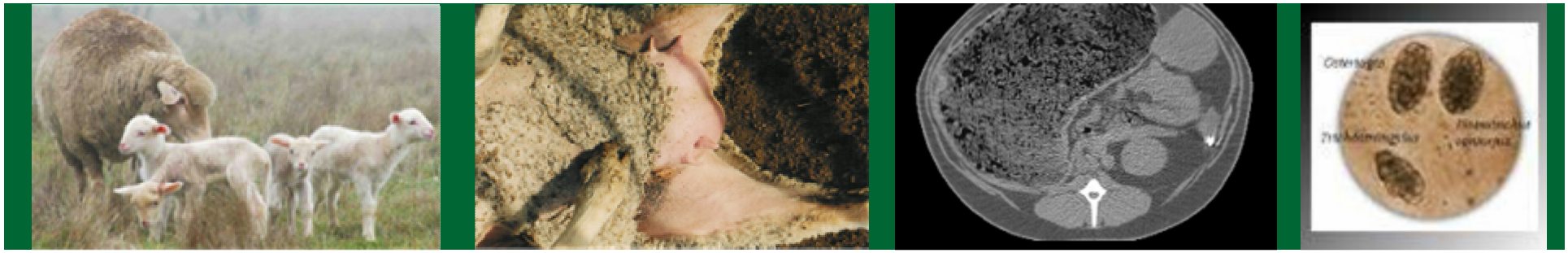
Wool $$
GFW, FD,
SS, SL

Mature ewe
size
AWT

Worm
resistance
WEC

Things you can't see are often the most important in maternal traits!

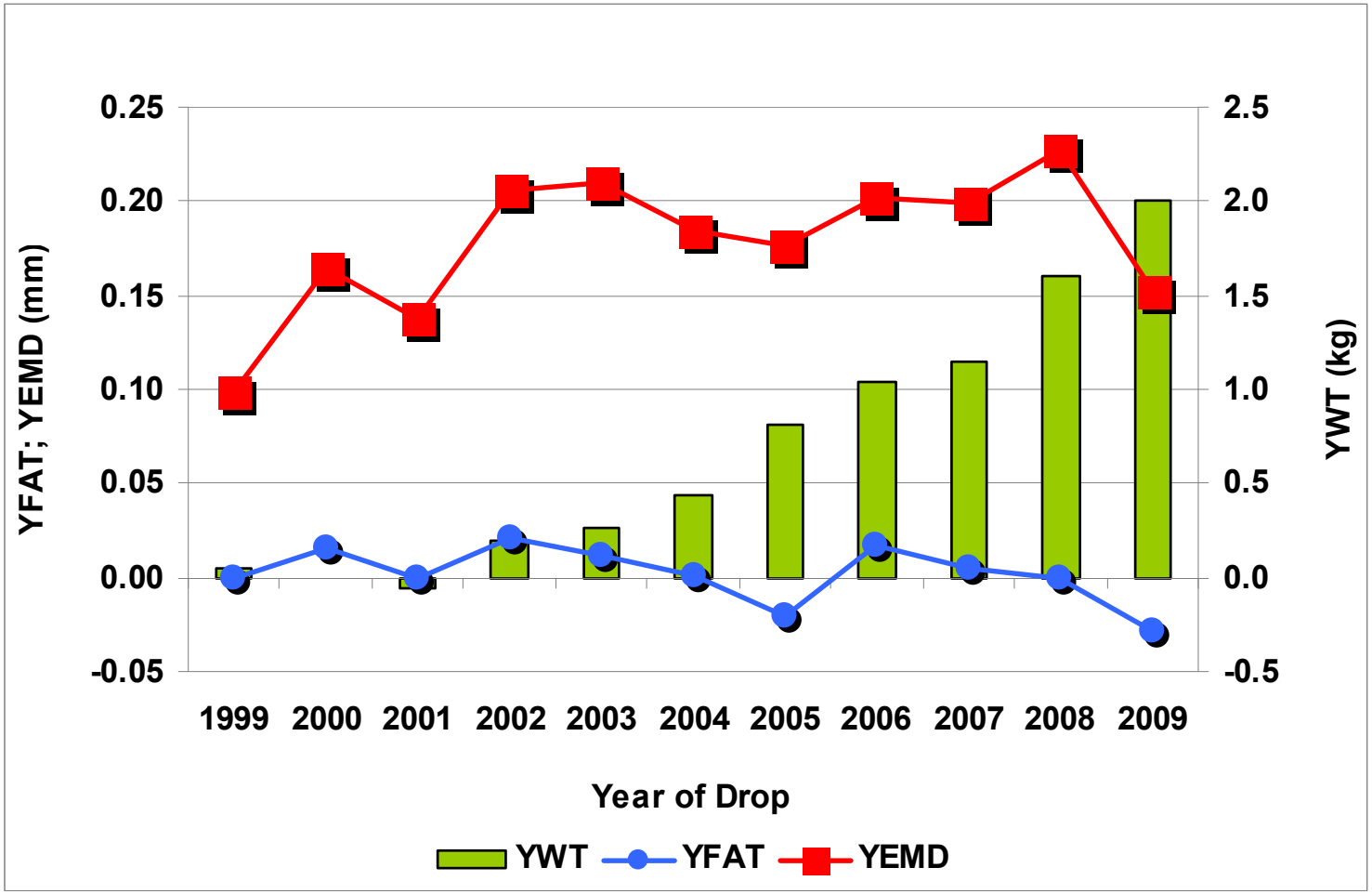
- Reproductive rates
- Maternal performance
- Fat and muscle
- Internal parasite resistance (worms)



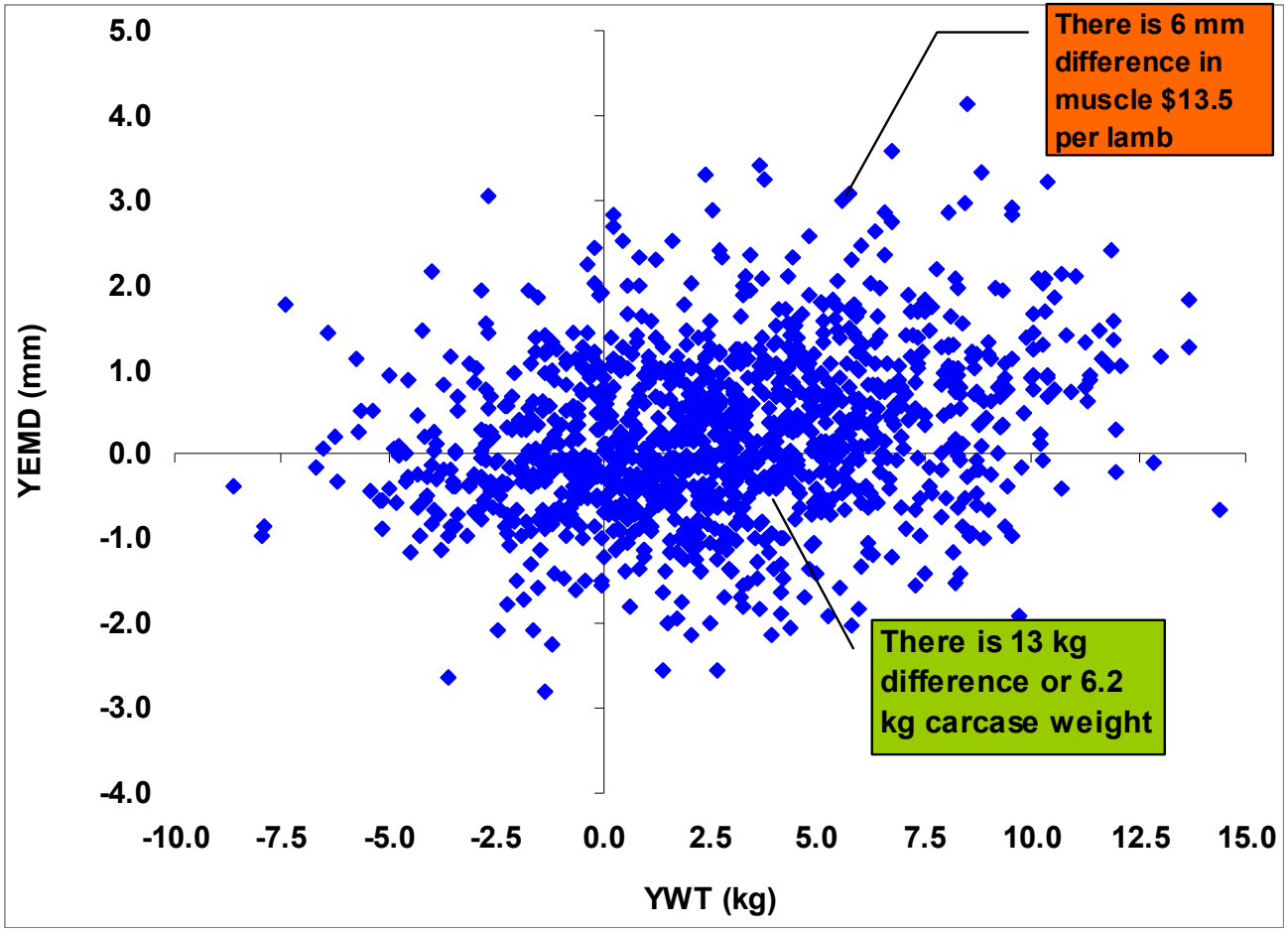
Maternal genetics (must do's)

- Get serious about meat!
- Shift to an earlier focus on growth
- Start to use reproduction variation
- Increase muscle
- Maintain fat
- Must not get them too big!

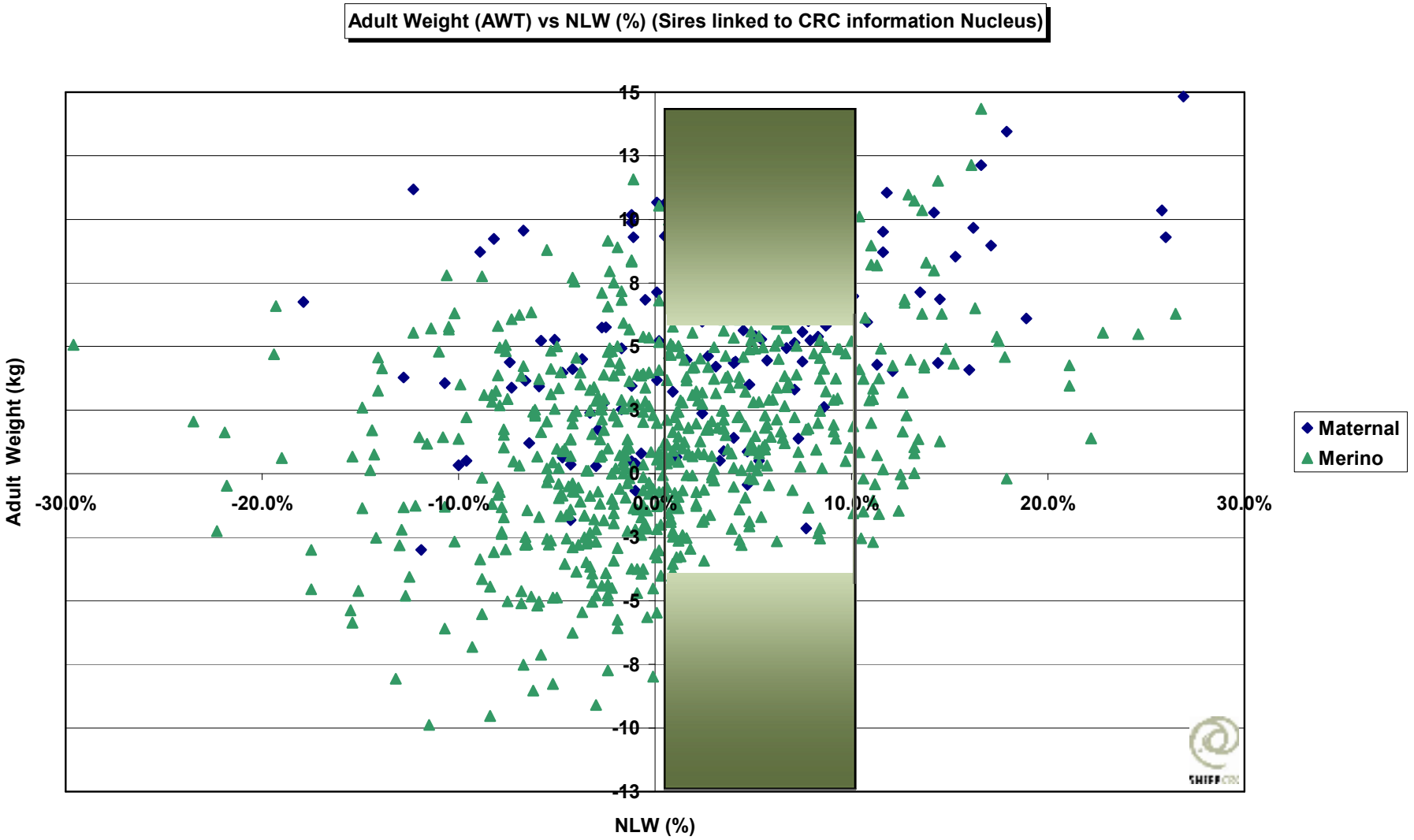
Genetic trends for Merino



Growth and muscle in Merinos
(1,604 sires)



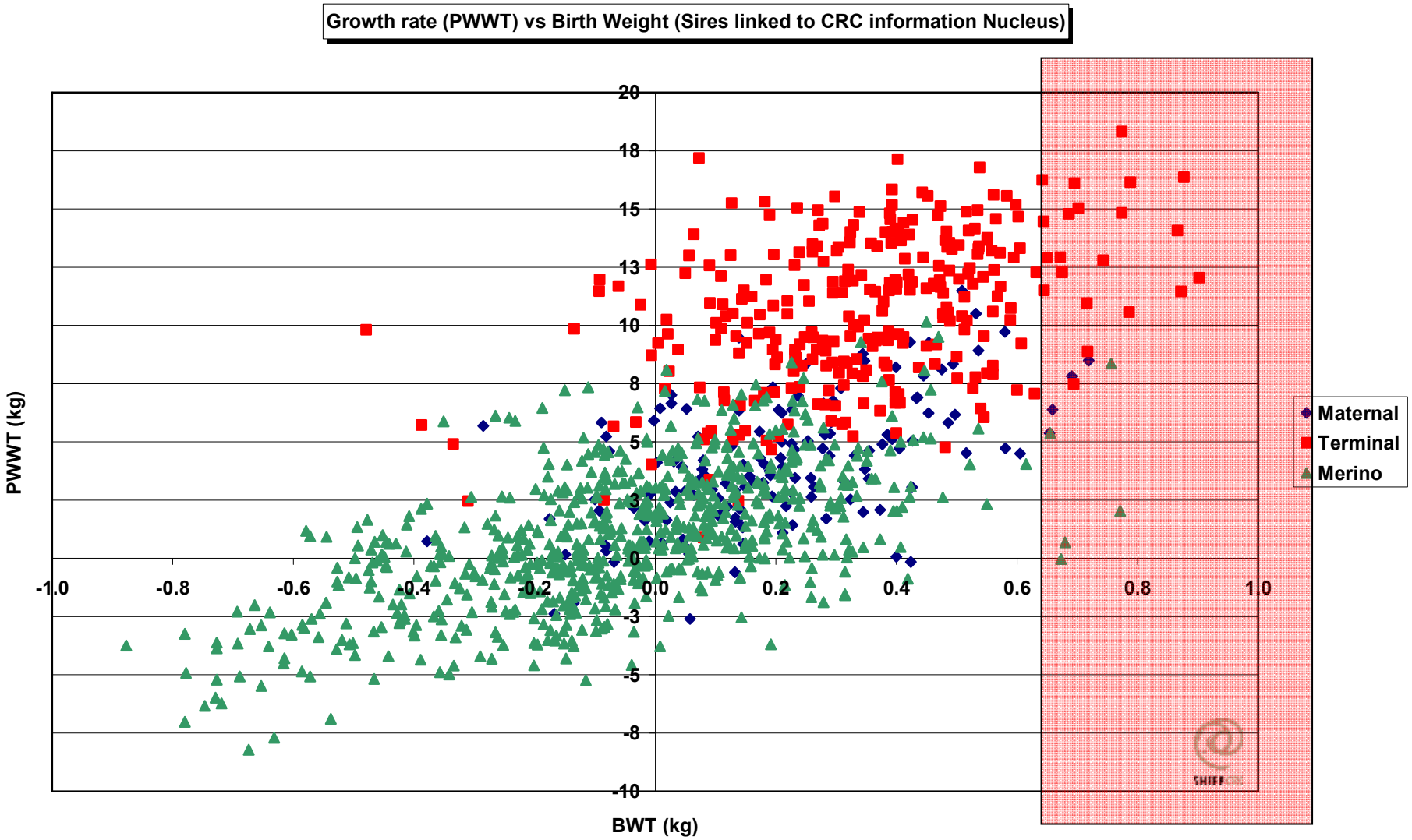
Reproduction rate (NLW) in Maternals



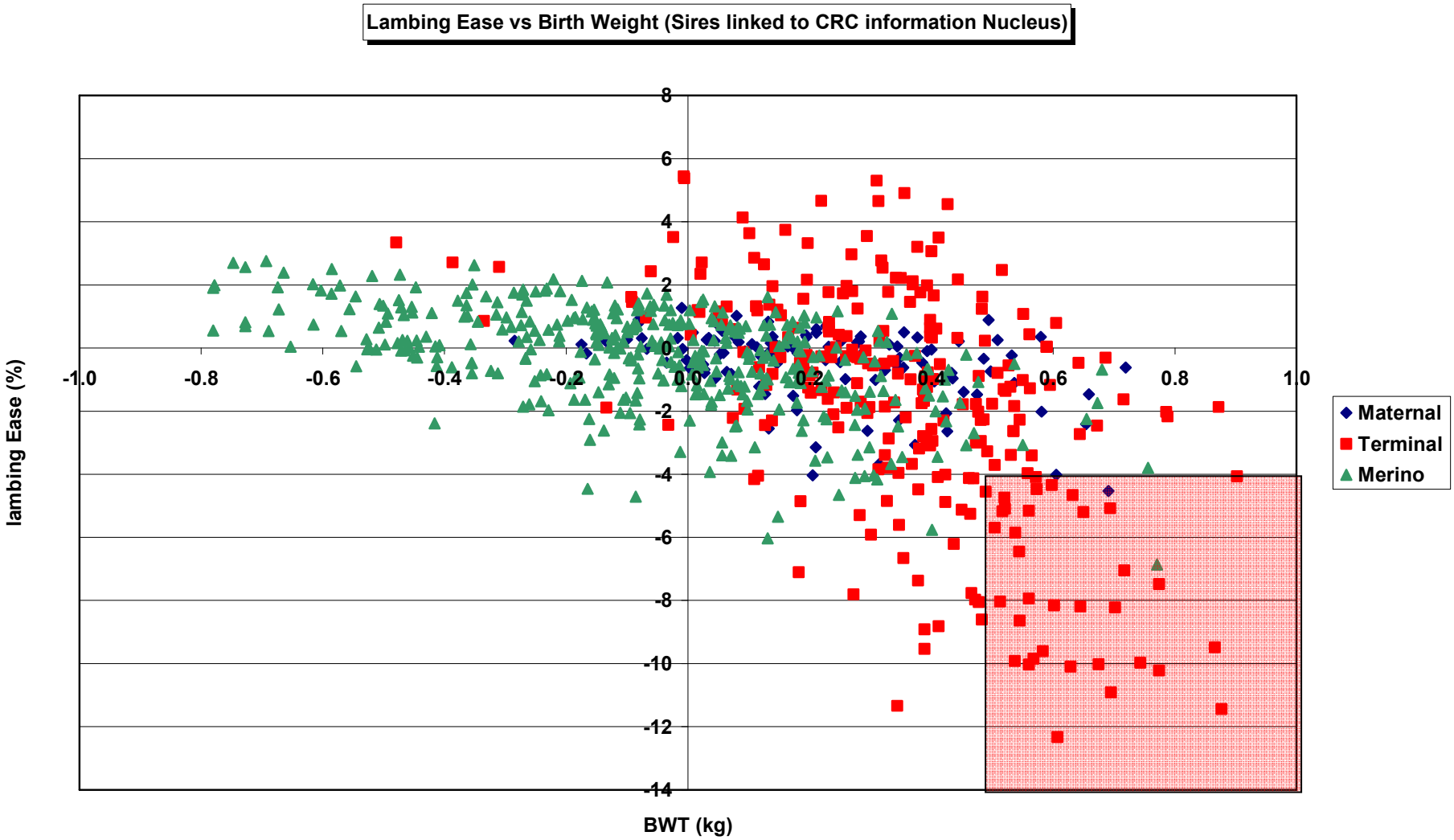
Ensuring sustainability

- Lamb and ewe mortality are key profit drivers
- Worms are biggest health cost in lamb production (reduce dressing %)
- Mature ewe size is critical (70% of feed costs)

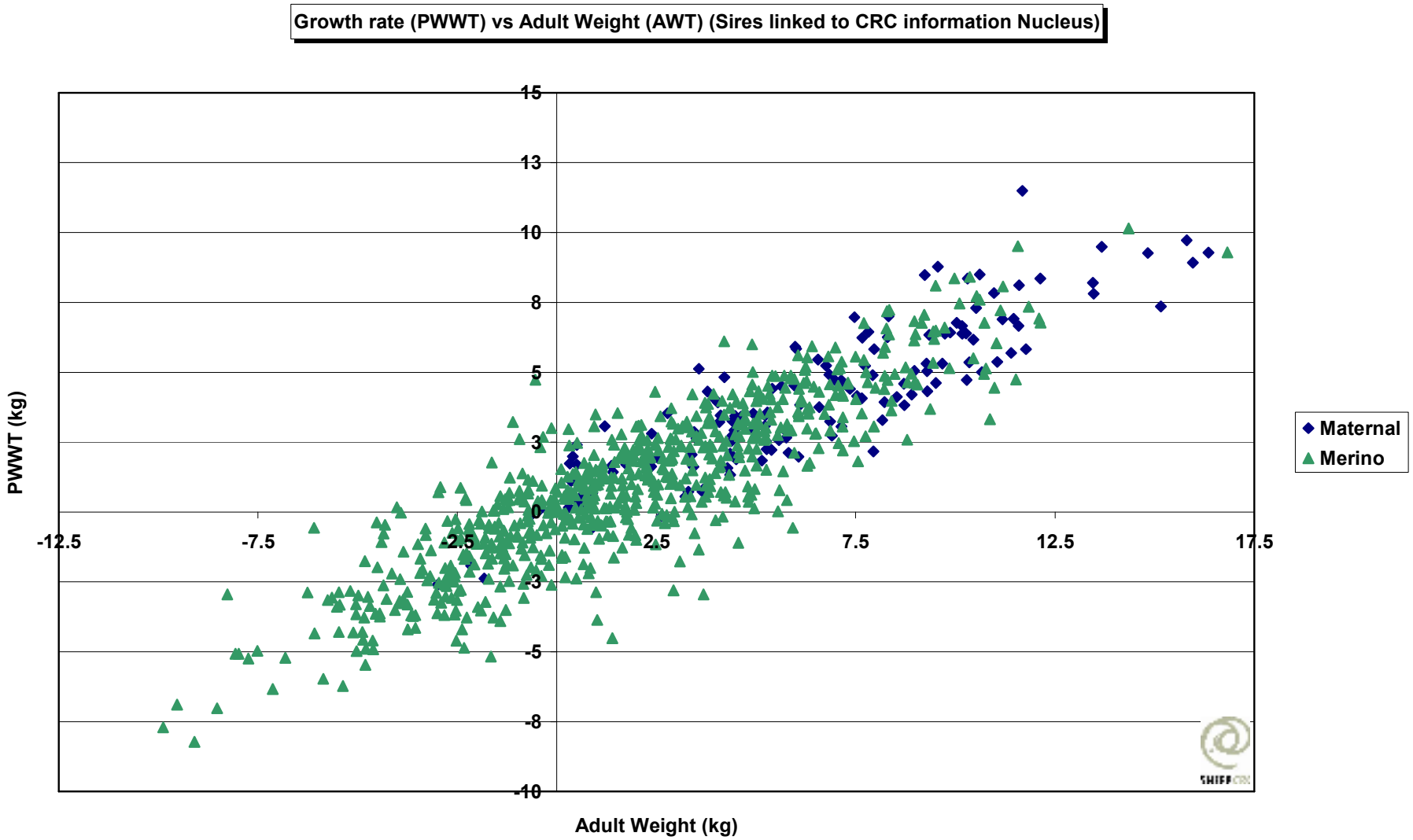
We can get growth and maintain birth weight



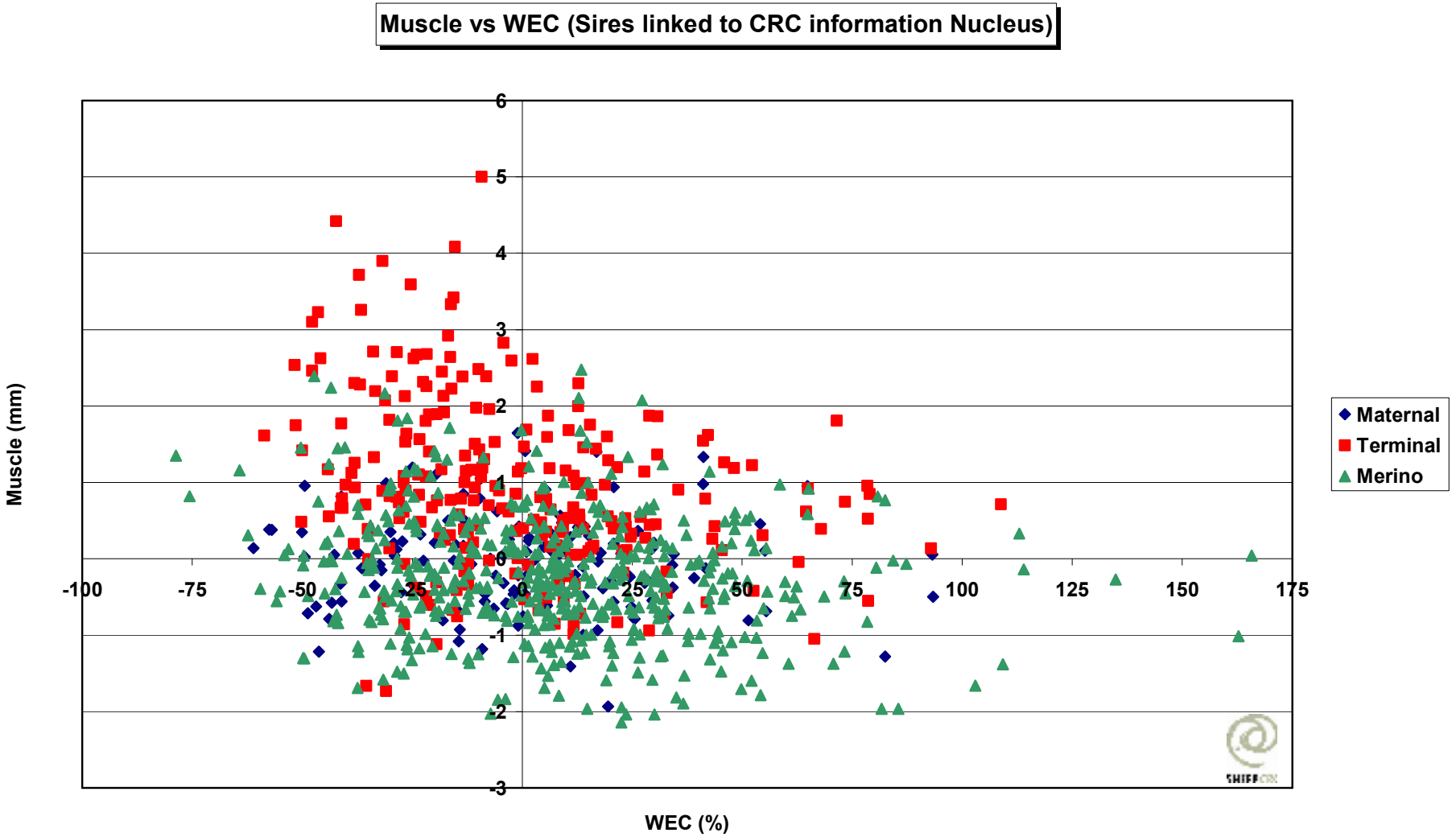
Maintaining birth weight will help lambing ease and reduce mortality



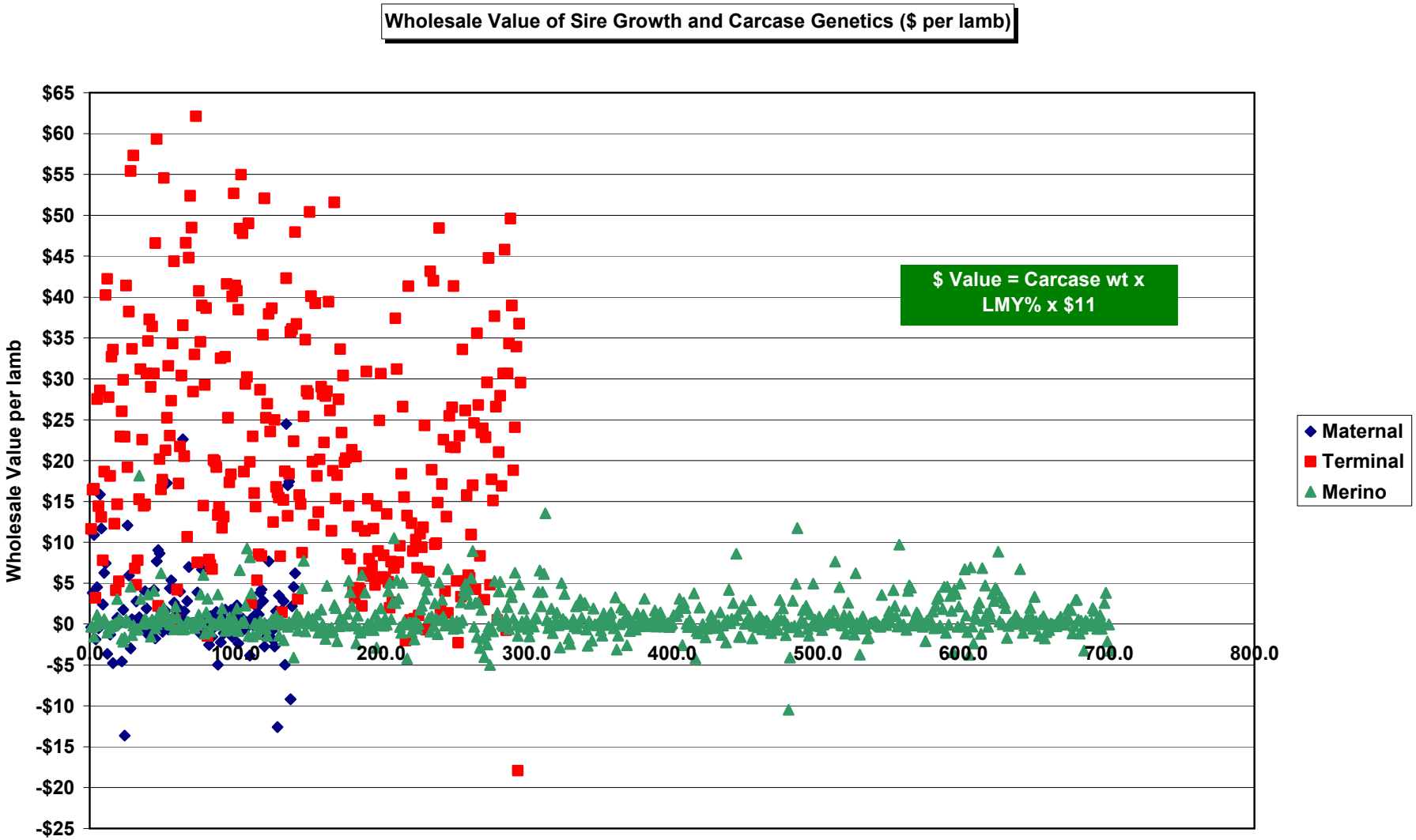
Measure adult weight to limit mature size



You must have muscle and WEC



Does all this information pay!



Maintaining or improving eating quality

- Remember the consumer pays the money
- Eating quality is now non-negotiable
- Most eating quality traits are highly heritable
- There are no real breed effects for eating quality (if you manage them well)
- There are some challenging correlations

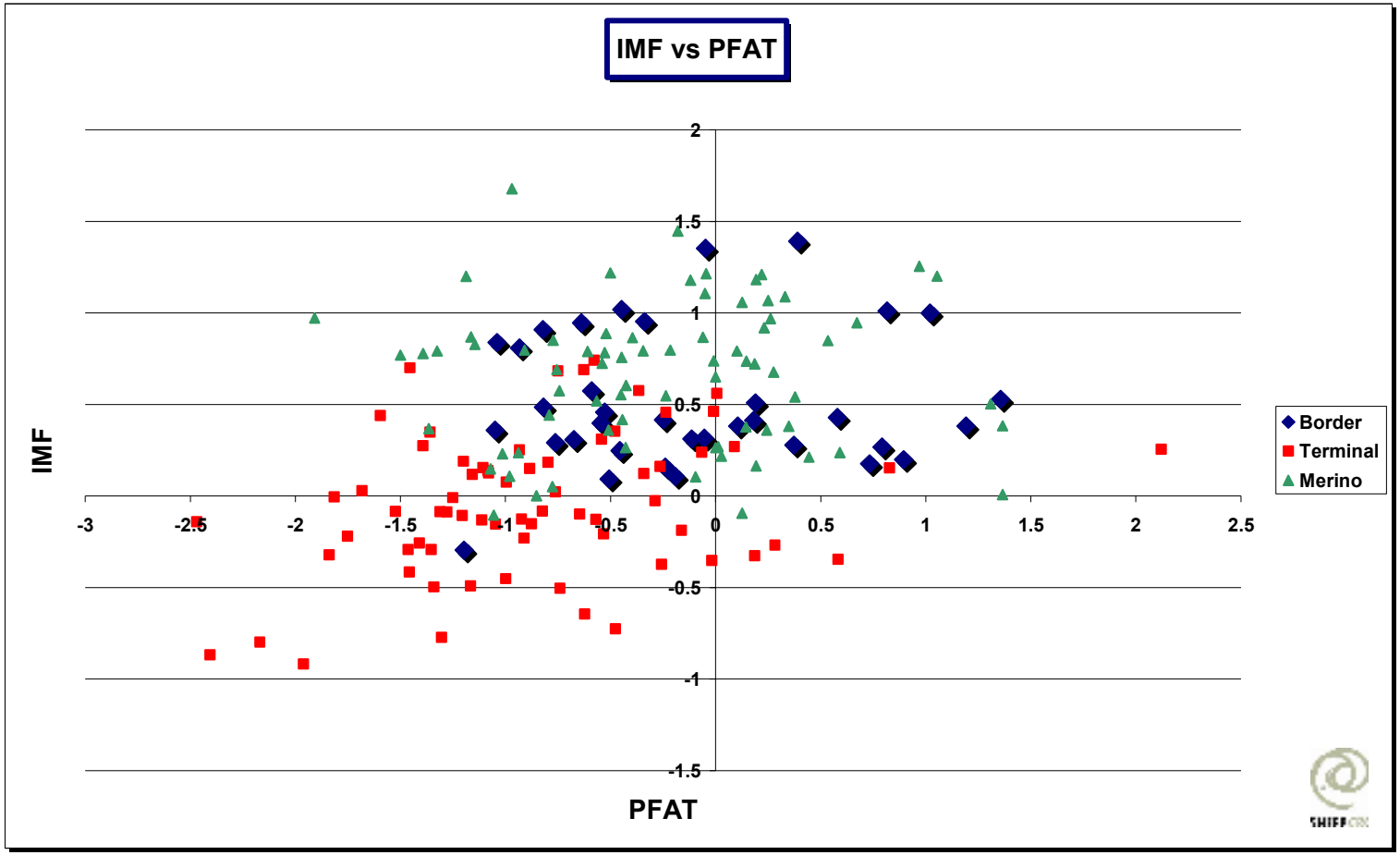
New meat traits
(soon to be released)

Trait	h^2	Breed Effects	Sire Effects
Yield	Mod	*	***
Toughness shear force	High	*	***
Retail colour	Mod	*	***
Dress %	High	*	***
IMF	High	**	***

Maintaining or improving eating quality

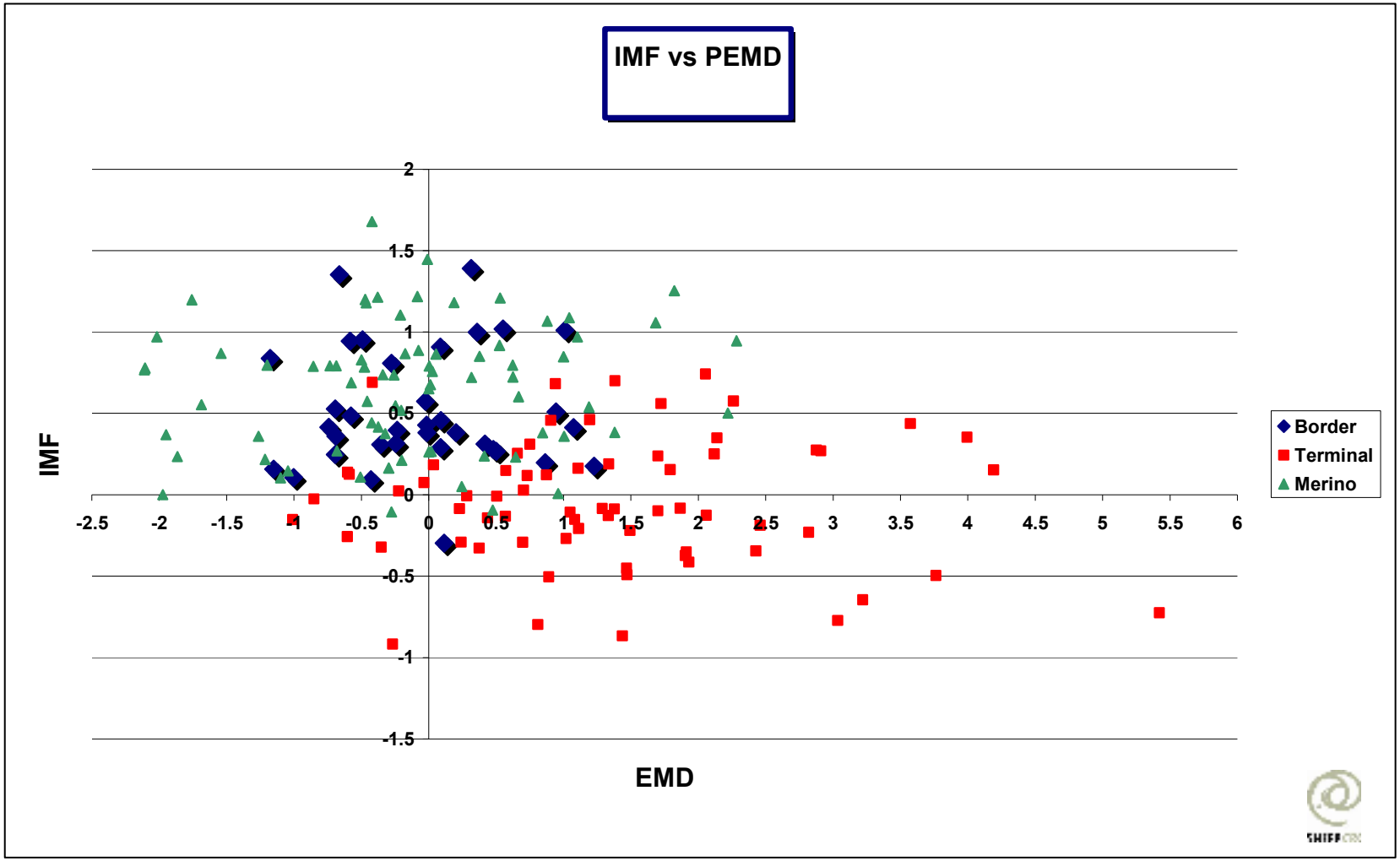
Trait	EMA	LMY	DR%	IMF
LMY	0.38			
DR%	0.65	0		
IMF	0	-0.51	0	
Shear	0.22	0.39	0	-0.79

Variation in intramuscular fat!



(Note: results shown for 21.5kg HSCW)

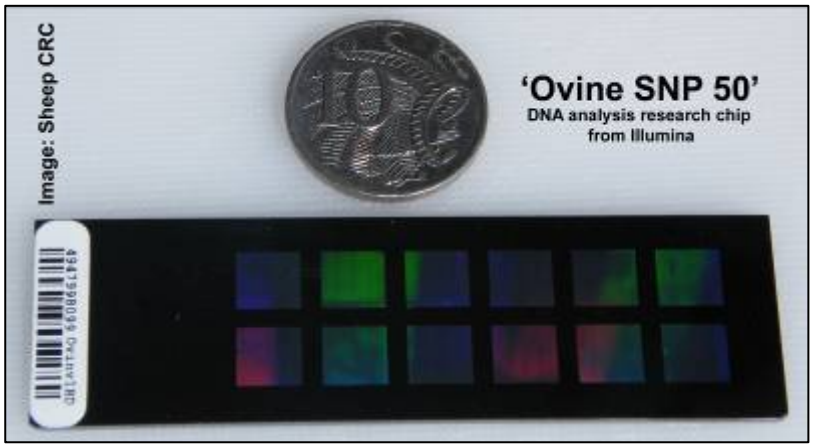
Variation in intramuscular fat!



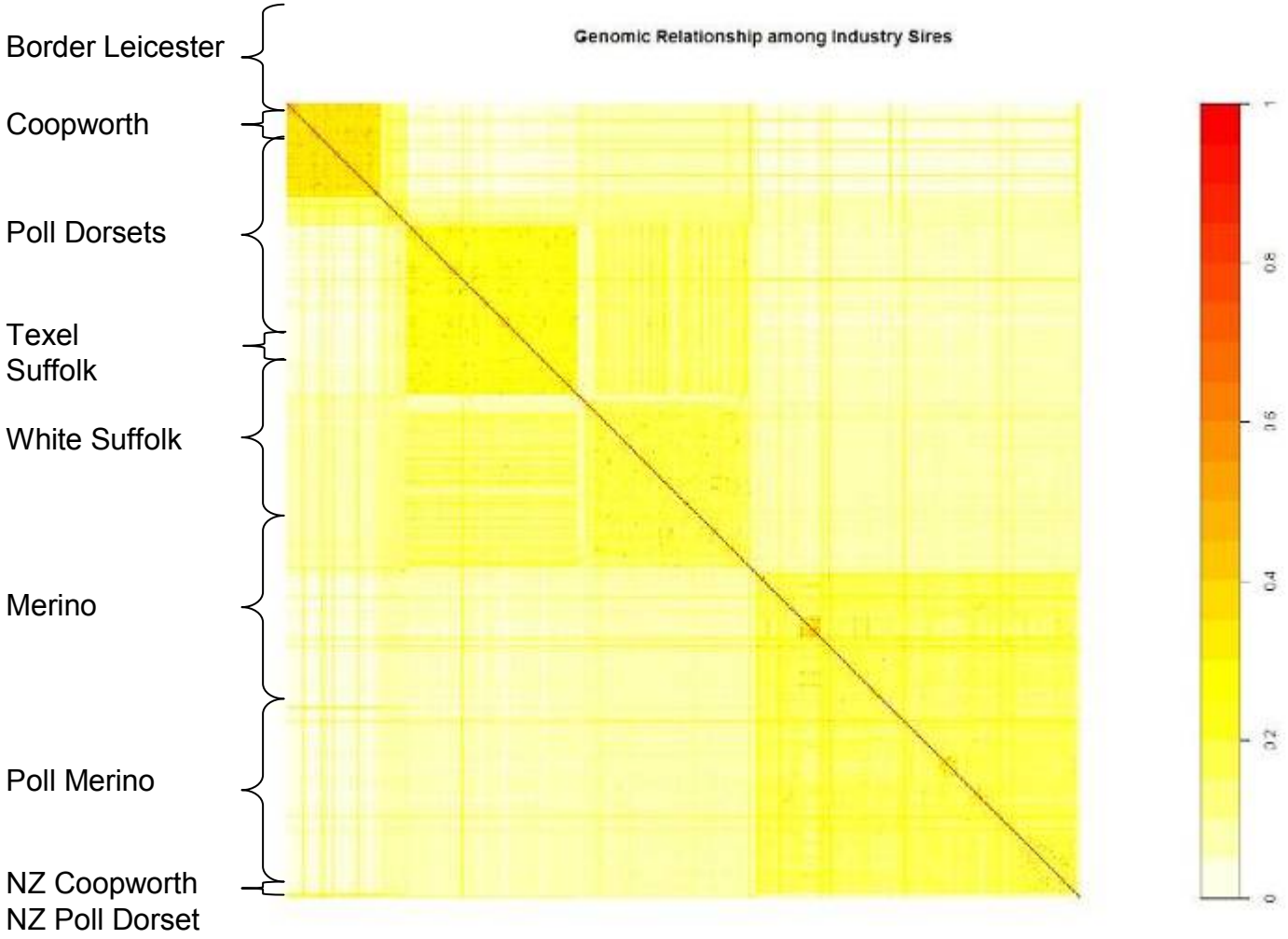
(Note: results shown for 21.5kg HSCW)

The genomic way forward – pilot trial

- We have the SNP chip
- This technology will:
  1. reduce generation interval
  2. improve accuracy
  3. select for hard to measure traits
- Initial R&D results:
  - are promising
  - show phenotypes are key
- We will have ASBVs^{M} by Christmas



Breed will become less important



The genetics scorecard

- We will meat the carcase weight challenge
  - **Will industry handle 25 kilogram carcase average?**
- Reproduction just needs focus
  - **Will you start and pay for maternal genetics?**
- Carcase and eating quality are now locked in
- It is your choice on sustainability
  - **Don't make sheep hard work.....**

THE FUTURE IS NOW