

Complementary and Antagonistic Relationships between Breech Flystrike Indicator Traits and Key Production Traits

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Introduction

- Breech fly strike difficult trait to directly select on
- Focus on breeding for resistance through indicator traits
- Wrinkle, wool cover and colour, dags and fleece rot
- Require correlations between indicator and production traits
- Across v within flock effects also an issue



Importance of visual traits

- Main goal to increase resistance to breech strike through indirect indicators
 - simultaneously with productivity improvements



Importance of visual traits ~ Other goals

- Robust resilient sheep
- Increased survival
- Smaller/less crutching
- Reduced reliance on chemicals
- Improved wool quality
 - Colour, character and fleece rot
- Reduced urine stain and dags
 - Contamination and flystrike
- Production
 - Some favourable / unfavourable associations



What data is available

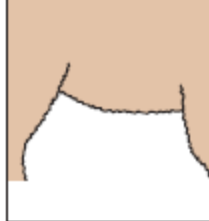
- Sheep Genetics Database
 - Australia's Genetic evaluation for sheep
- Industry ram breeder flocks
- Plus;
 - Sheep CRC Information Nucleus flocks
 - Australian Merino Sire Evaluation
 - Research Flocks
 - AWI breech flocks
 - SA Selection Demonstration Flock
 - QPLU\$

Fly strike indicator traits

- Current
 - Breech and body wrinkle
 - Breech cover
 - Dags
 - Wool colour
 - Wool character
 - Fleece rot
- Future
 - Face Cover
 - Urine Stain
 - Others?

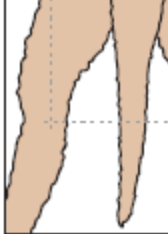
Visual Scoring ~ Breech Traits

Body wrinkle



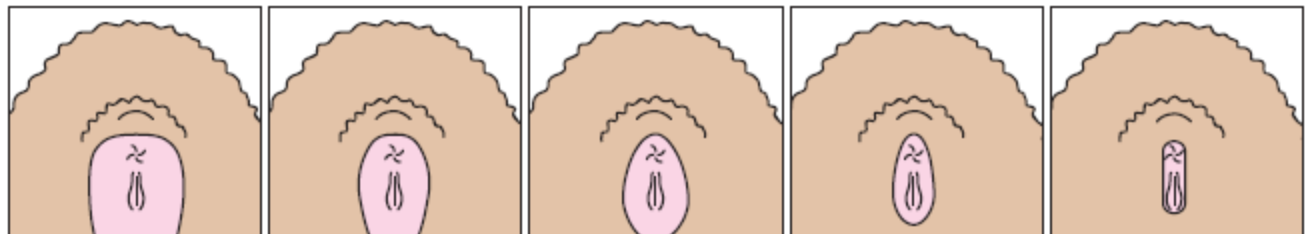
Score 1

Breech wrinkle – Lambs



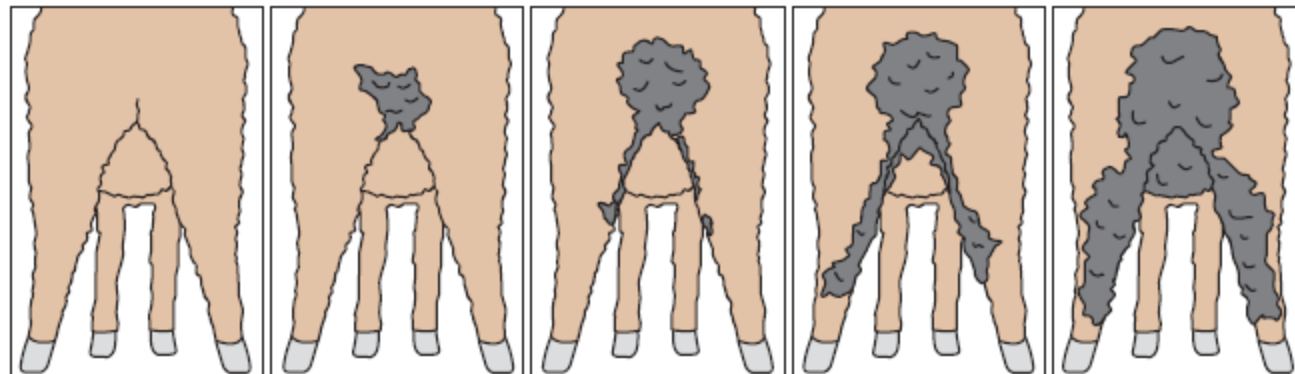
Score

Breech cover



Score

Dag



Score 1

Score 2

Score 3

Score 4

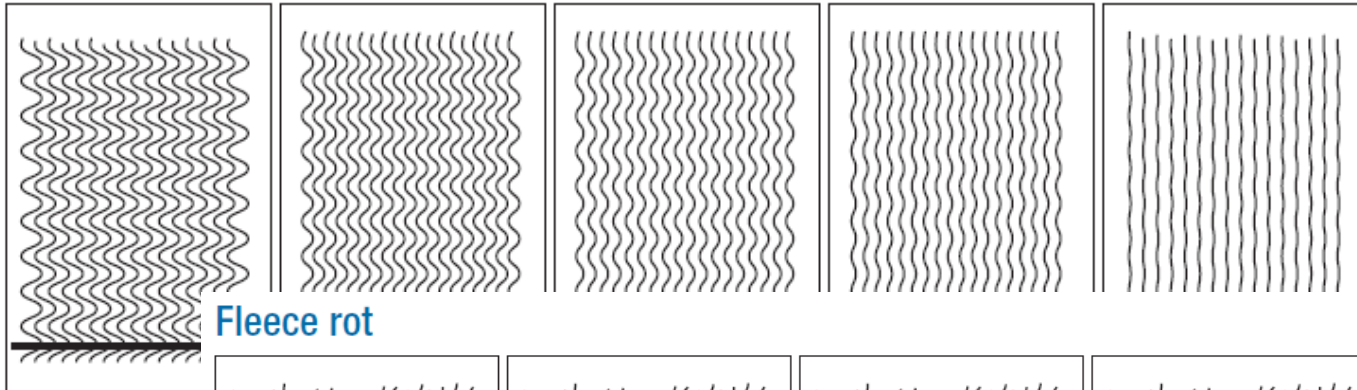
Score 5

Visual Scoring ~ Wool Traits

Wool colour



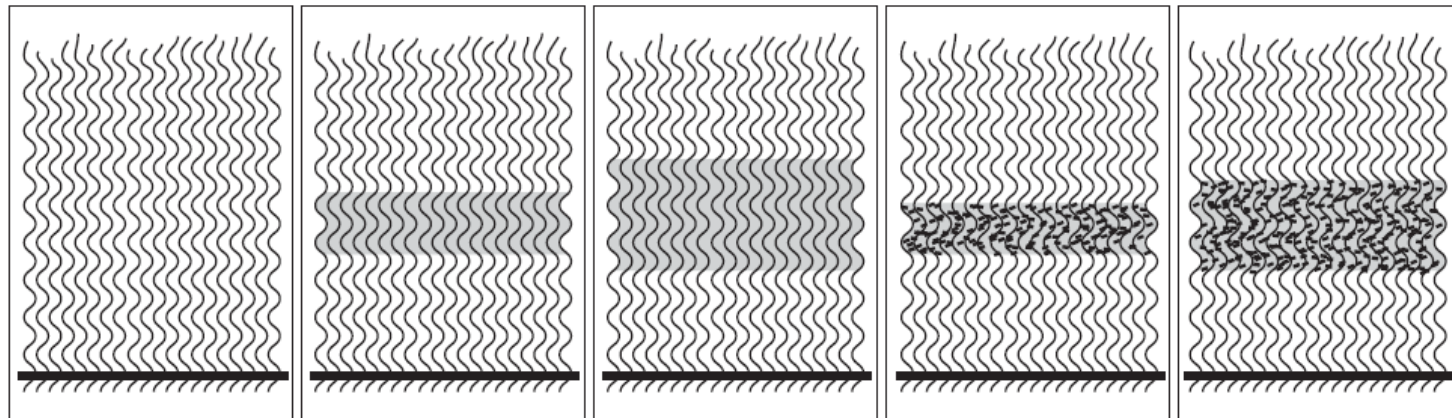
Wool character



Score

Fleece rot

Score 1



Score 1

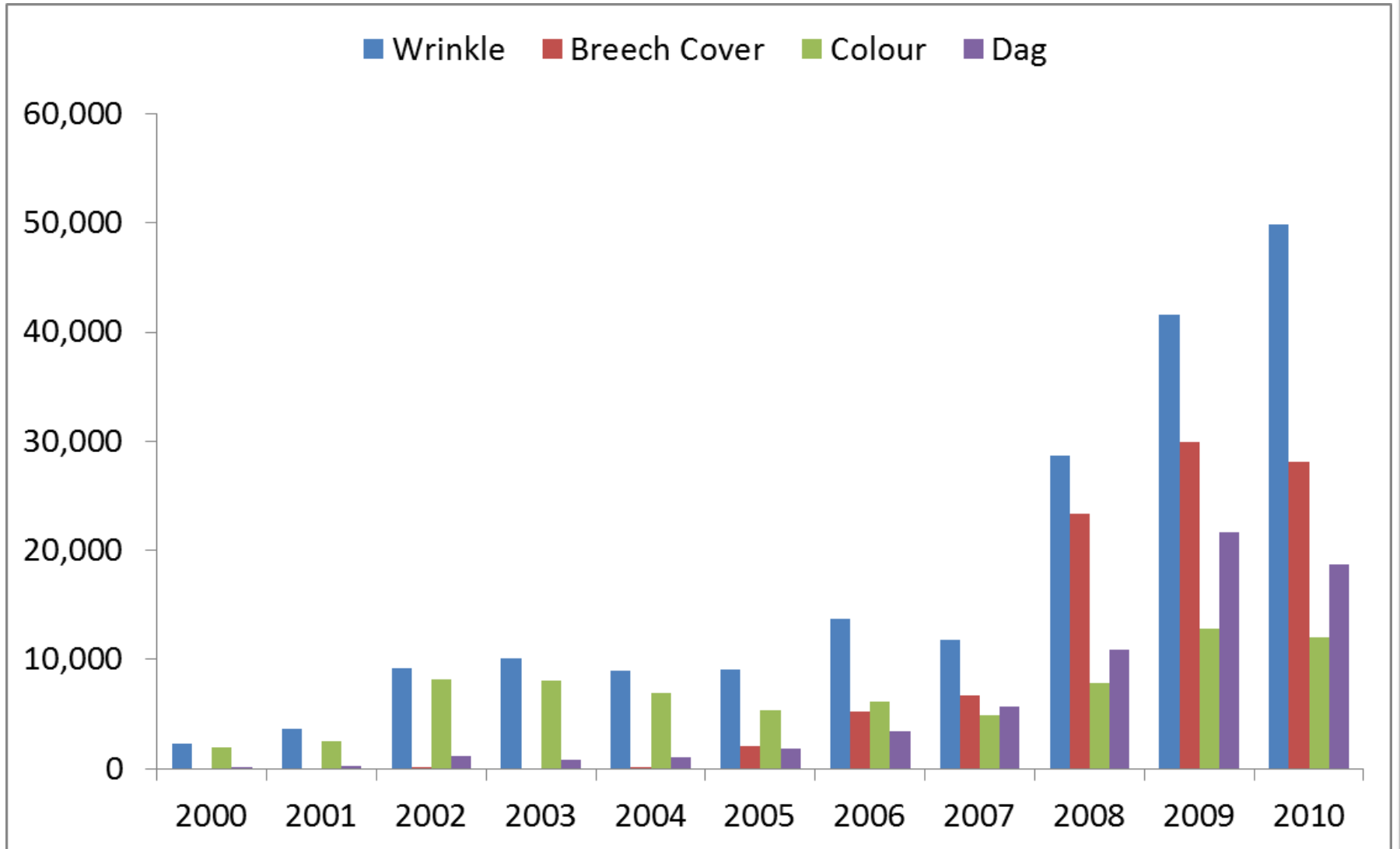
Score 2

Score 3

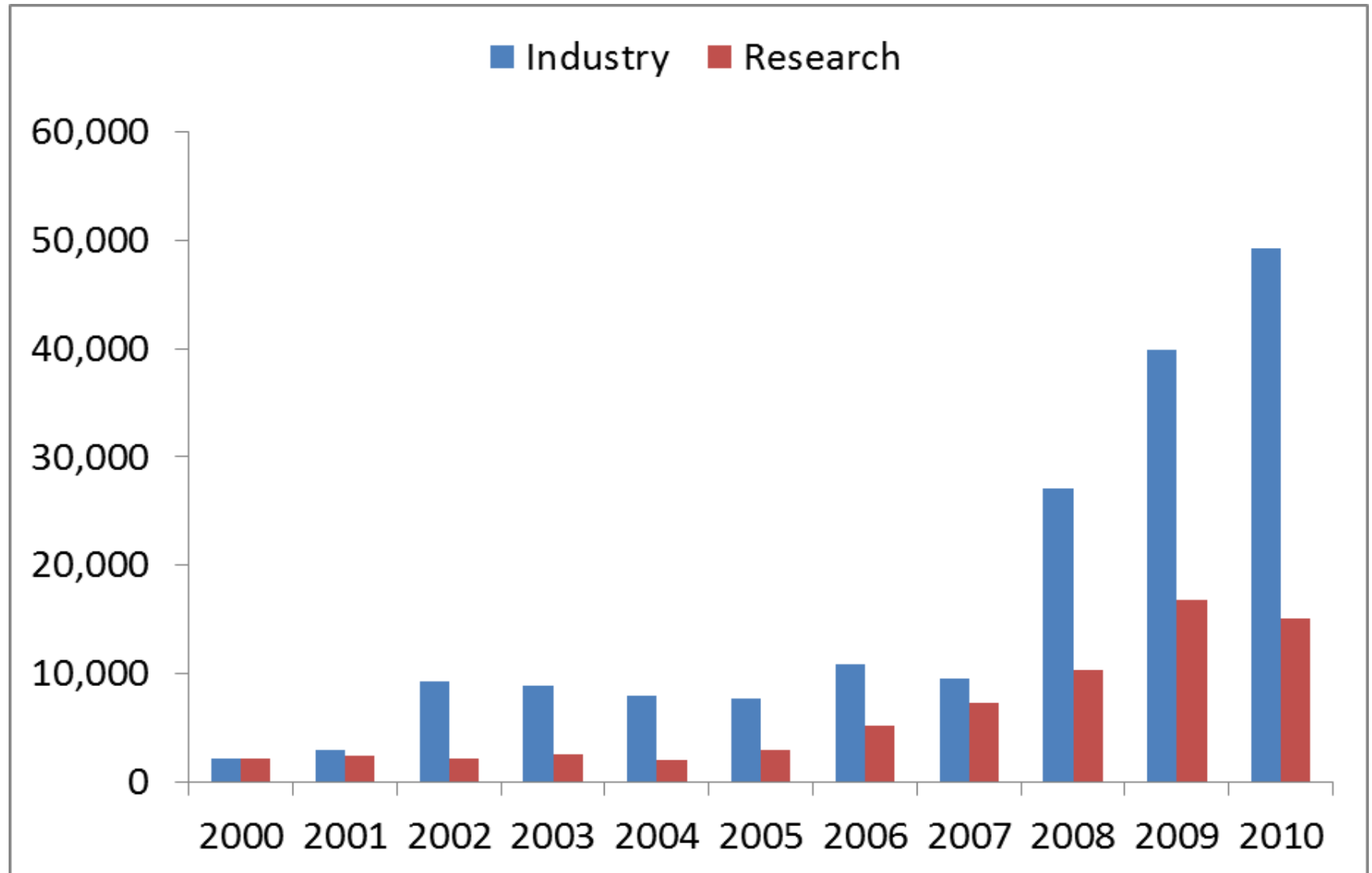
Score 4

Score 5

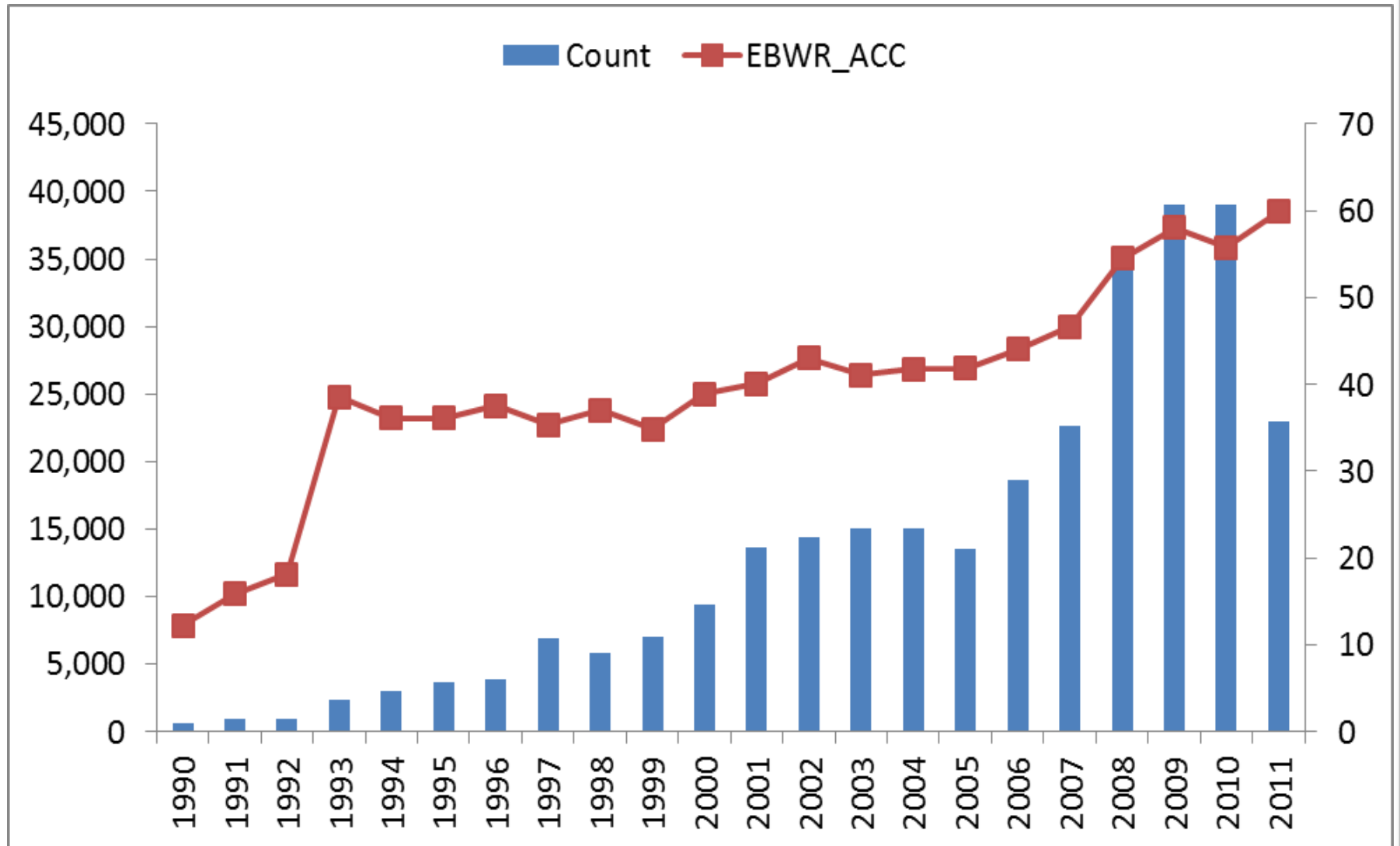
How much data is there?



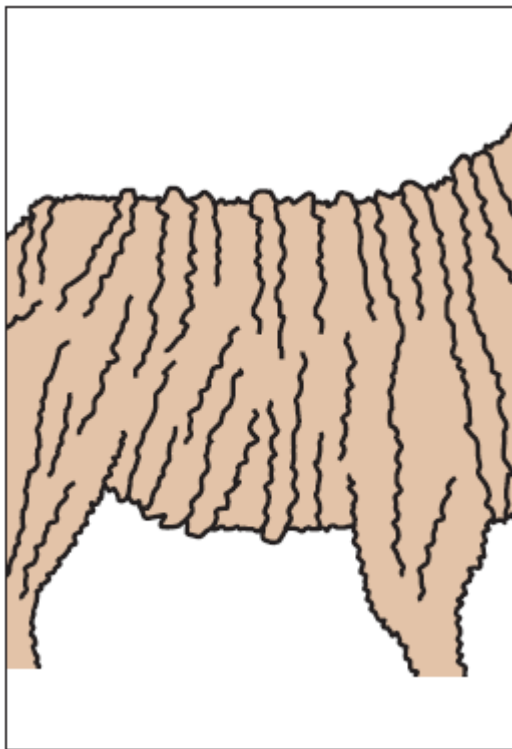
Source of Data



Accuracy increasing



Why ASBVs

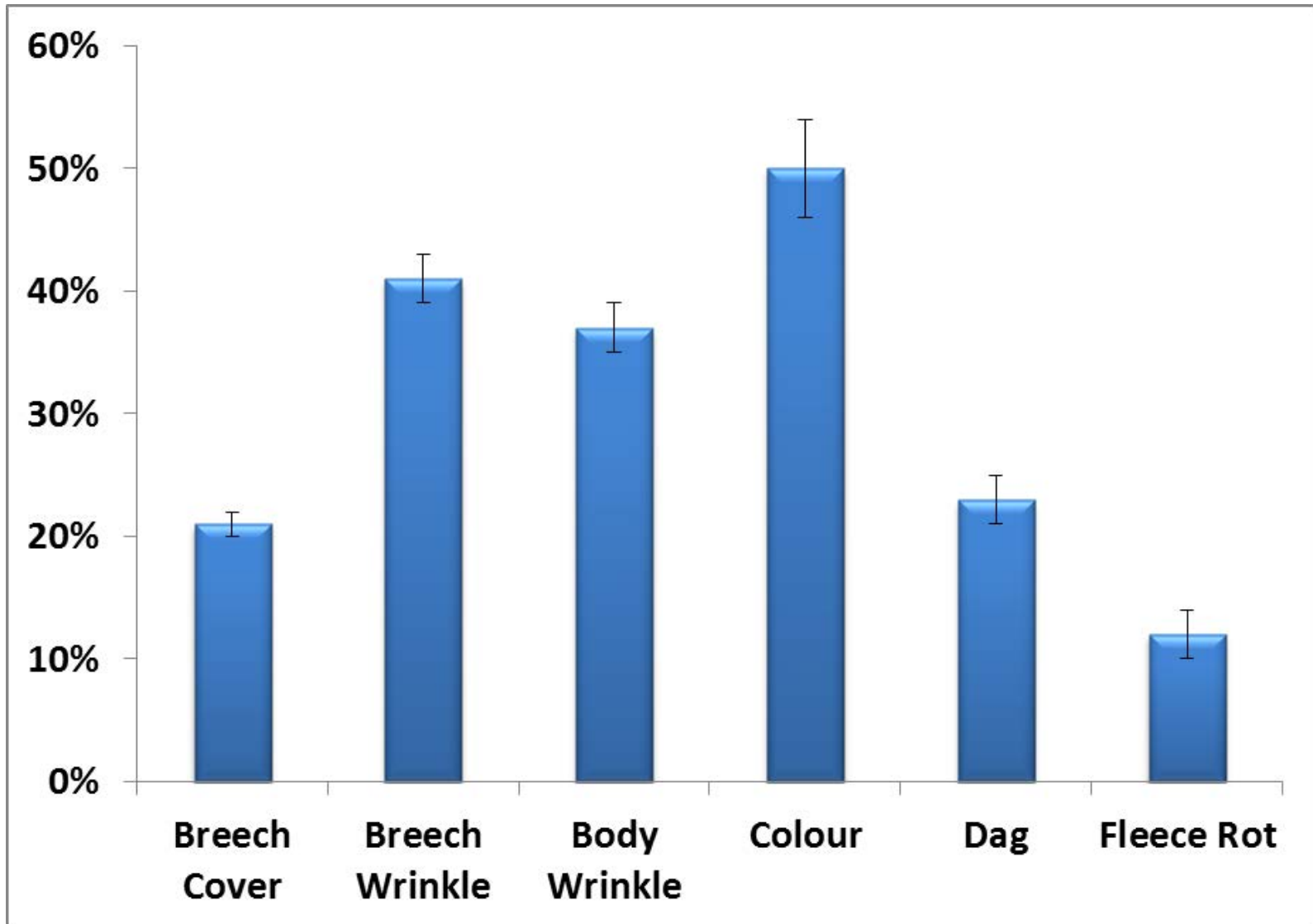


What about the effects of environment and nutrition

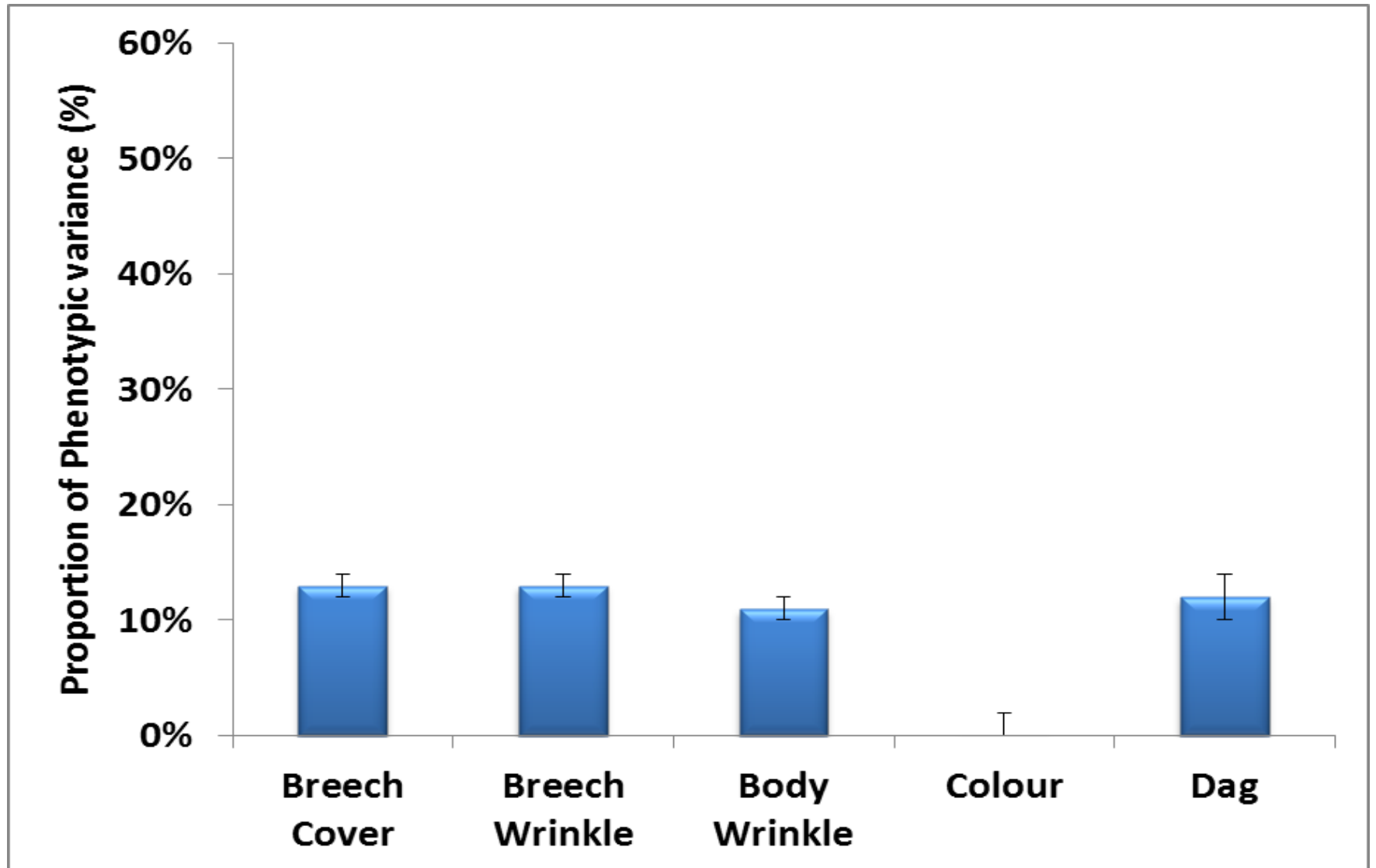
- Single or twin (-0.3 to -0.5)
- Born in a drought (-0.5 to -1.0)
- From a maiden dam (-0.1 to -0.2)

Need to select for genes, NOT nutrition

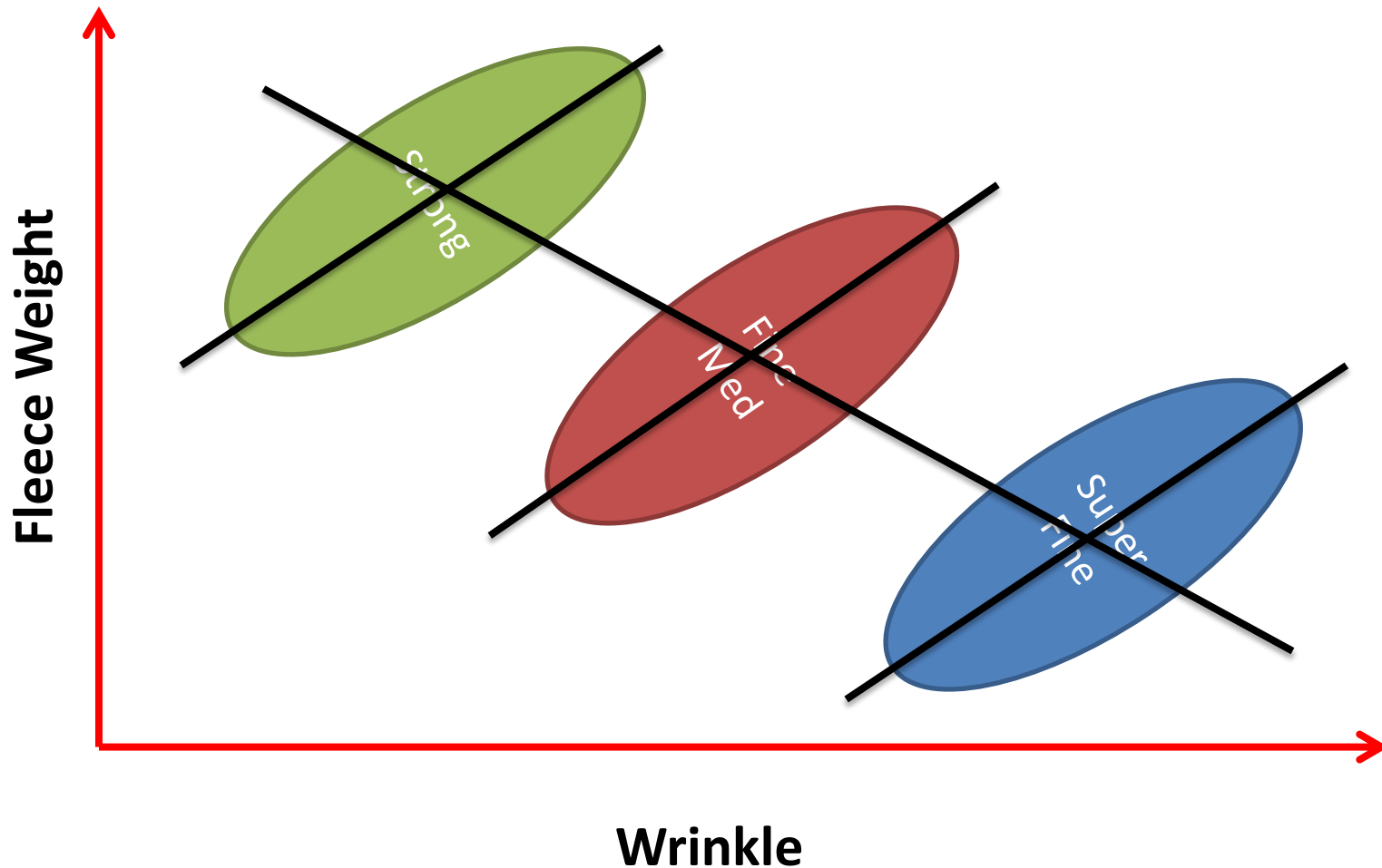
How heritable are these traits?



Maternal effects?



Why are across flock effects important?



Correlations with breech wrinkle

Trait	Across Flock (all animals)	Within Flock (Home-bred only)	Flock Average ASBV (Last 5 Yrs)
Body weight	-0.23 ±0.04	-0.14 ±0.05	-0.33
Fleece weight	0.26 ±0.04	0.20 ±0.05	0.04
Fibre diameter	-0.26 ±0.03	-0.22 ±0.05	-0.27

All visual traits ~ Preliminary

	Breech Cover	Breech Wrinkle	Colour	Dag	Fleece Rot
Body weight	-0.31	-0.23	0.17	Nsd-0	0.28
Fleece weight	-0.11	0.26	0.18	Nsd-0	0.32
Fibre diameter	-0.22	-0.26	0.14	Nsd-0	0.25

All visual traits ~ Preliminary

	Breech Cover	Breech Wrinkle	Colour	Dag	Fleece Rot
Body weight	-0.31	-0.23	0.17	Nsd-0	0.28
Fleece weight	-0.11	0.26	0.18	Nsd-0	0.32
Fibre diameter	-0.22	-0.26	0.14	Nsd-0	0.25

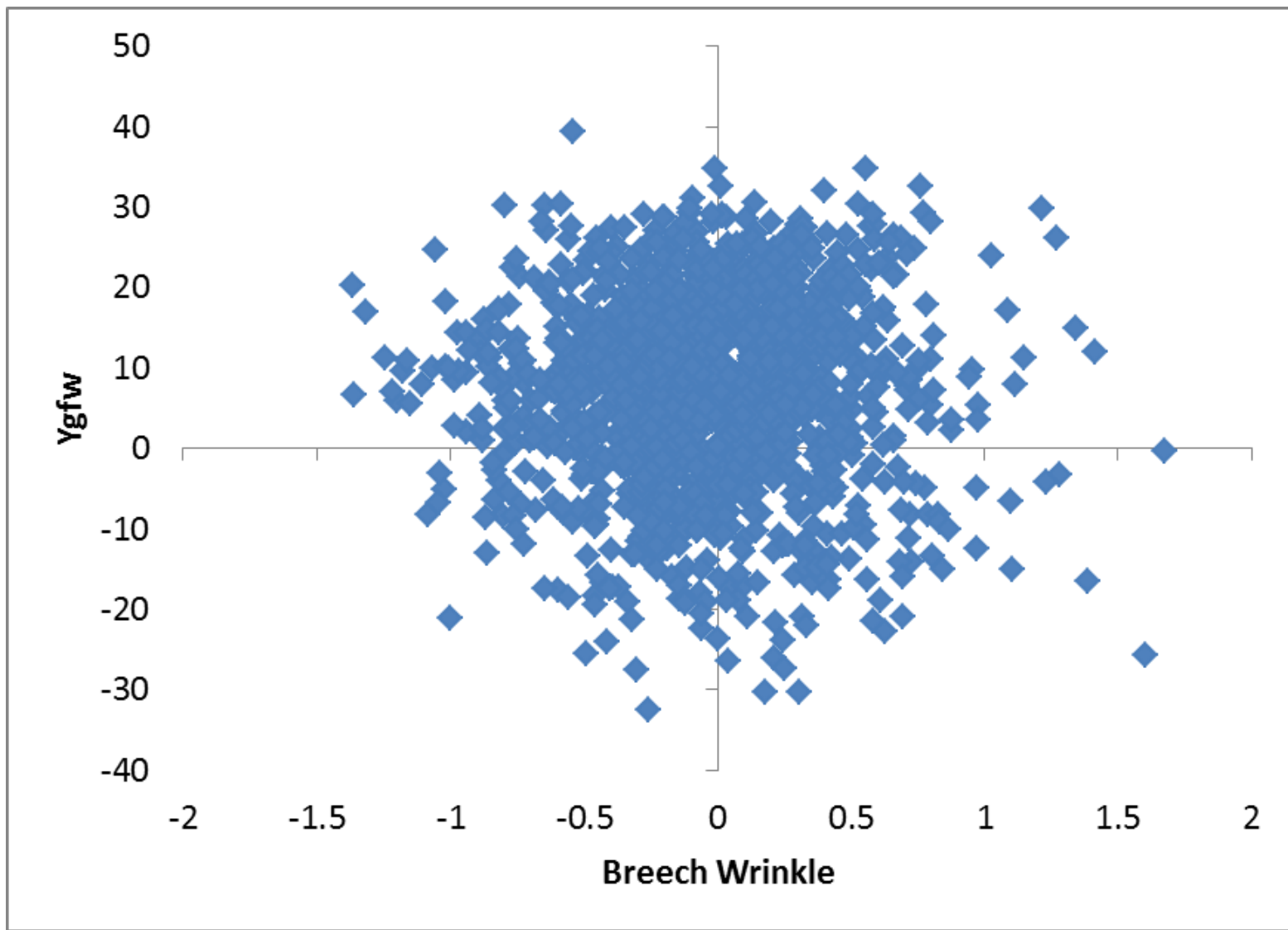
Unfavourable

Favourable

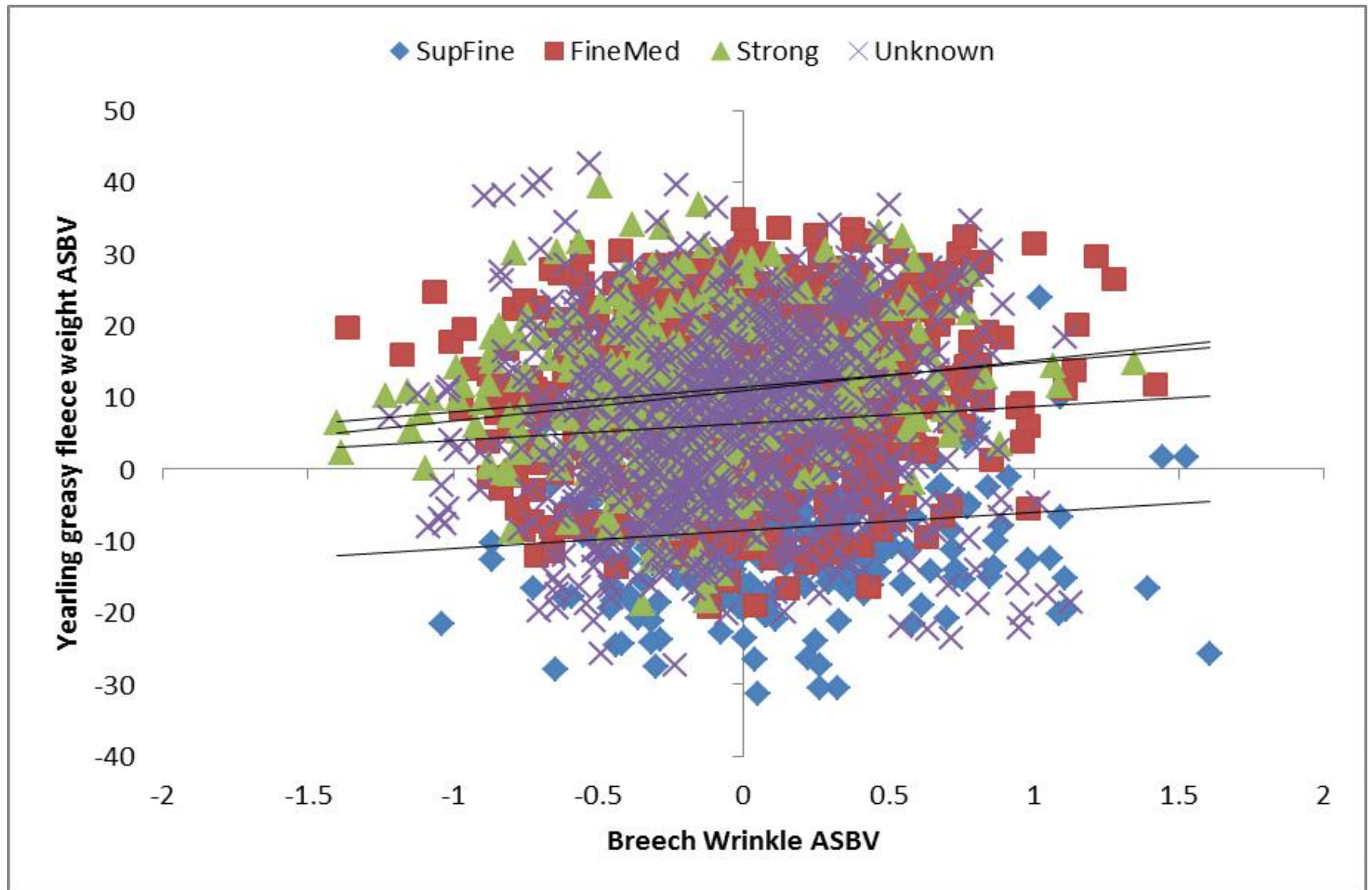
All visual traits ~ Preliminary

	Breech Cover	Breech Wrinkle	Colour	Dag
FDCV	0.10	0.27		
Staple Length	-0.10	-0.37	0.14	-0.20
Staple Strength	-0.03	0.05	-0.11	

Sire Variation ~ Wrinkle & Fleece Weight



Within types



Wrinkle and Reproduction

	Breech Wrinkle	Body Wrinkle
NIb	-0.18 (0.07)	-0.12 (0.08)
NIw	-0.19 (0.08)	-0.11 (0.08)

Wrinkle and Reproduction

	Breech Wrinkle	Body Wrinkle
NIb	-0.18 (0.07)	-0.12 (0.08)
NIw	-0.19 (0.08)	-0.11 (0.08)

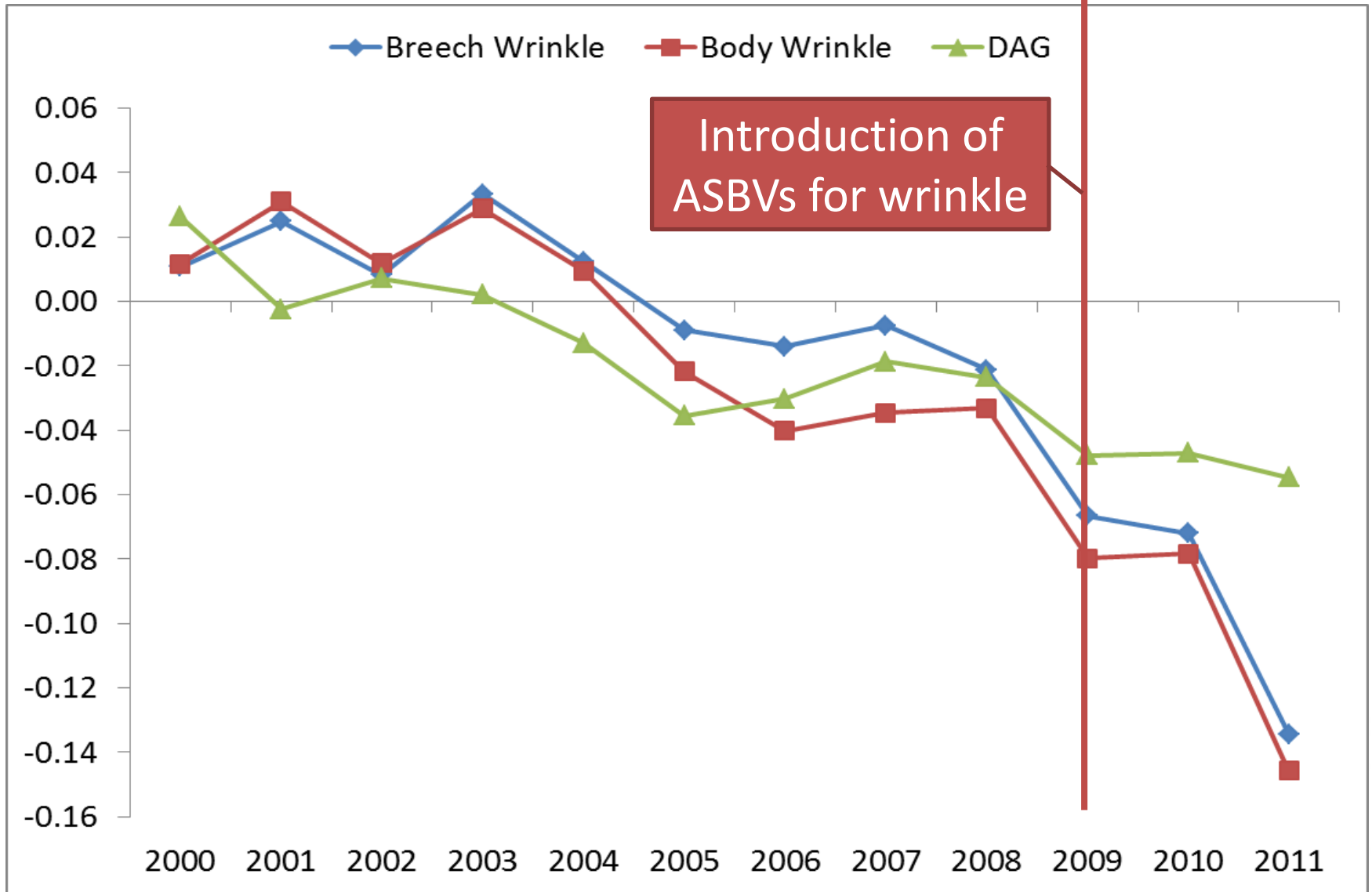
Unfavourable

Favourable

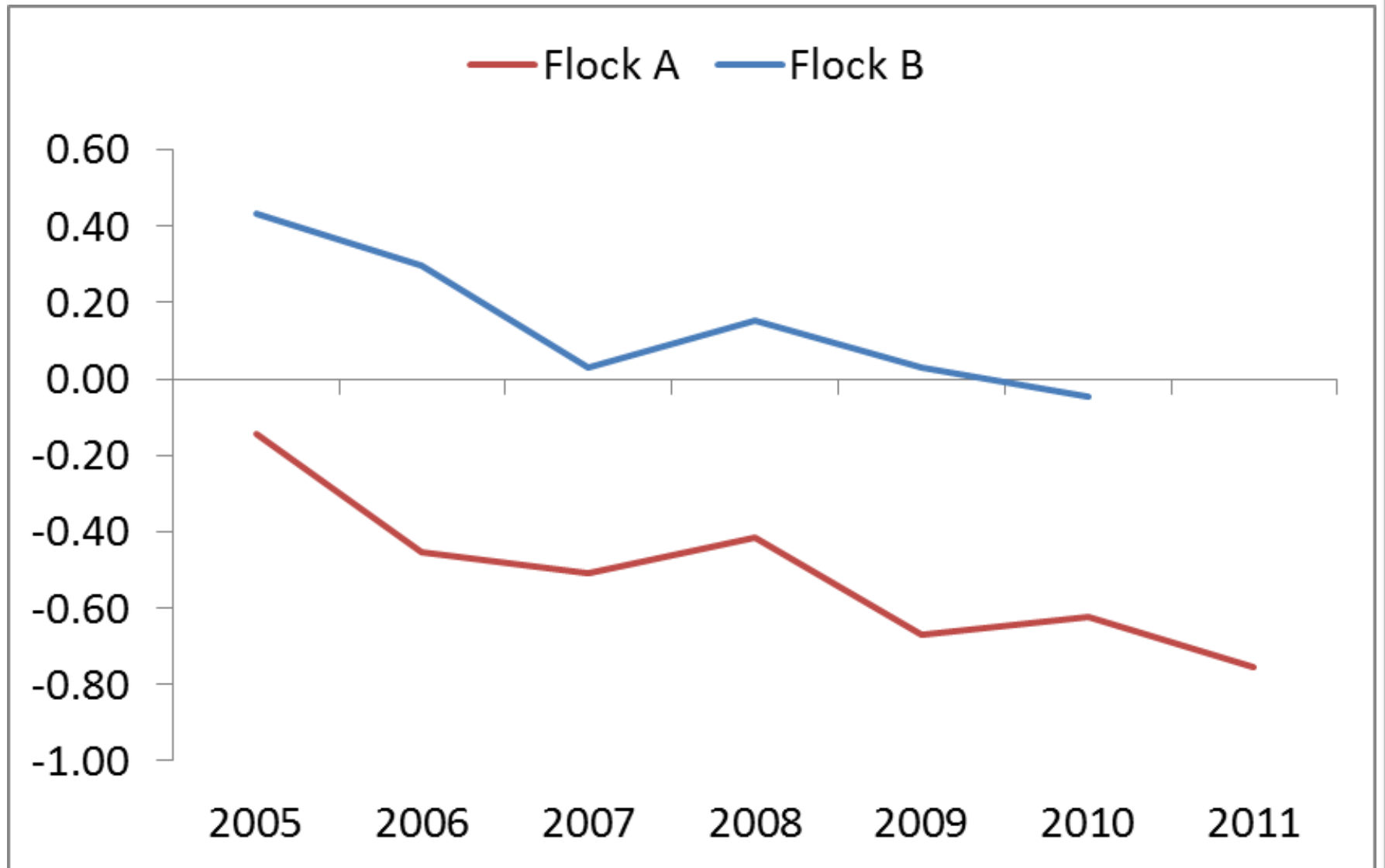
Correlations within visual traits

	Breech Cover	Breech Wrinkle	Body Wrinkle	Colour	Dag
Breech Wrinkle	0.26				
Body Wrinkle	0.29	0.68			
Colour	-0.10	-0.22	-0.17		
Dag	0.07	0.16	0.14	-0.09	
Fleece Rot	0.02	-0.07	0.11	0.71	-0.13

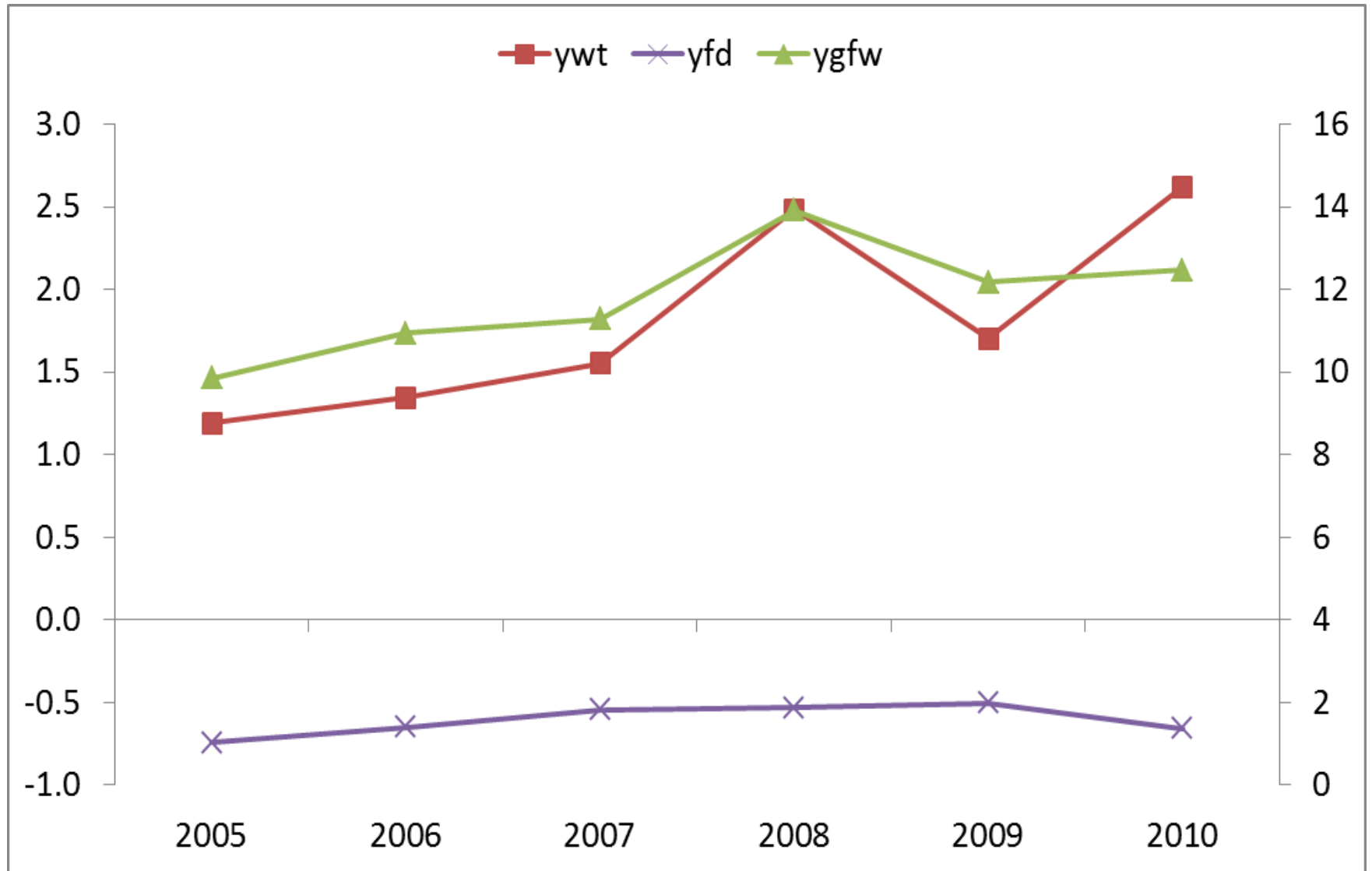
Sheep Genetics Trends



Emphasis variable between flocks



Response in other traits for Flock B



Conclusions

- Clear differences between within flock and across flock correlations
 - Some favourable
 - Some antagonistic
 - No bigger than Fleece Weight v Fibre Diameter
- Research flocks have demonstrated power of across flock selection
 - SDF and T13
- More traits in future eg. Urine stain and face cover

Conclusions

- Sire selection strategies
 - There are high indexing, high fleece weight, low wrinkle, low dag, low cover sheep and flocks
 - Opportunities already exist for across flock selection to make significant improvements
 - Need to balance all traits, Top sires by definition break the correlation averages
 - Will influence the selection responses achieved
- Multiple predictions required?
- Care required when selecting across flock



Acknowledgements

SHEEP GENETICS

