Precision Livestock Management: Cattle Trait Correlation

Setting goals and objectives for your cattle enterprise

When planning to improve your cattle herd performance and profitability, your enterprise goals and objectives will influence the traits you select for (e.g. increased growth rate, improved calving ease).

Before considering bull selection, develop a plan of what you are trying to achieve within your breeding program – often referred to as breeding objectives or breeding goals (these form part of your overall enterprise goals and objectives). A breeding objective describes the 'ideal' animal you aim to breed, with consideration to your production system and markets. For more information on setting breeding objectives and selection – see <u>MLA (https://www.mla.com.au/research-and-development/Genetics-and-breeding/breeding-objectives-and-selection</u>).

The performance of any one animal is a combination of their genes (genetic potential) and the rearing /growing environment (grazing management, feed, age).

Performance = Genes + Environment

To realise a gain from genetics, it is important to consider the following steps:

- 1. Identify the key production traits that drive your cattle enterprise profit.
- 2. Identify the genetic opportunities to improve key production traits.
- 3. Select the best genetics for your business see MLA (https://mbfp.mla.com.au/cattle-genetics/).

Traits

Traits, or characteristics, of animals, are inherited from their parents, but are also influenced by their environment. In cattle, these traits include:

- weight traits, e.g. increased birth weight, increased 200-day weight
- carcass traits, e.g. increased rib fat, increased rump fat
- fertility/calving traits, e.g. increased scrotal size, improved calving ease
- other traits, e.g. higher flight time, lower net feed intake.











Trait correlation

Different traits maybe correlated, or linked, and selecting for one trait may impact other aspects of production. By selecting animals based on one trait, you may see an increase in another trait (positive correlation), or you a decrease (negative correlation).

Key production traits and their correlations

The following table shows the effects on production outcomes when selecting a single trait. However, you can manage these correlations by selecting animals based on indexes or a balance of traits you are interested in.

I'm selecting for	Bonus	Things to watch
Growth Traits		
Increased birth weight	 ✓ 200, 400 and 600 day weight increases ✓ Carcass weight increases ✓ Cow weight increases 	
200-day weight	 ✓ 400 and 600 day weight increases ✓ Carcass weight increases ✓ Cow weight increases 	
400-day weight	 ✓ 600-day weight increases ✓ Carcass weight increases ✓ Cow weight increases ✓ Eye muscle area increase ✓ Retail beef yield increases 	✗ Rib fat decreases
600-day weight	✓ Carcass weight increases✓ Cow weight increases	
Cow weight	✓ Carcass weight increases	
Carcass Traits		
Carcass weight	 ✓ Eye muscle area increases ✓ Retail beef yield increases 	 Rib fat decreases Rump fat decreases Intramuscular fat decreases
Rib fat	 ✓ Eye muscle area increases ✓ Rump fat increases ✓ Intramuscular fat increases 	 Retail beef yield decreases
Rump fat	✓ Eye muscle area increases✓ Intramuscular fat increases	 Retail beef yield decreases
EMA	✓ Retail beef yield increases	× Intramuscular fat decreases
IMF		* Retail beef yield decreases

I'm selecting for	Bonus	Things to watch	
Calving Ease and Fertility Traits			
Calving ease - direct		 Birth weight decreases Gestation decreases Calving ease – of daughters, decreases 	
Calving ease – of daughters	✓ Birth weight increases✓ Gestation lend increases		
Scrotal size	✓ 400-day weight increases	 Days to calving decreases 	

Correlations adapted from <u>Millah Murrah Angus</u> (<u>http://www.millahmurrah.com/Articles/Understanding-Breedplan/Appendix-A-Trait-Correlations</u>)

More information

BREEDPLAN website (https://breedplan.une.edu.au/)

MLA - Cattle Genetics (https://mbfp.mla.com.au/Cattle-genetics)

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