Selection of Angus Bulls for Use in Northern Australia

Careful selection of the most appropriate bulls is an important factor in the successful infusion of Angus genetics into breeding programs in northern Australia.

Considered bull selection decisions are necessary to effectively utilise the vast amount of genetic variation that exists within the Angus population.

Setting a Breeding Objective

The key elements of the success in any breeding program are no different when using Angus bulls to those when using bulls of any breed, being careful planning, the use of good information to assist in decision making, and, above all, consistency and patience in the pursuit of desired breeding goals.

Before considering decisions regarding bull selection, it is important that producers develop a clearly defined plan of what they are attempting to achieve from their breeding program. This may be described as setting a breeding objective or breeding goals, and should consider aspects such as the relative economic importance of different traits, future customer requirements, future herd production targets and current herd performance.

Likewise, prior to any bull selection decisions being made, it is important that careful consideration be given to the design of the breeding system that will be utilised. There are many different strategies or systems that could be used for infusing Angus genetics into northern Australian breeding programs. These range from simple crossbreeding systems to more complex composite breeding programs, with no one system being suitable for all breeding herds or enterprises.

Considering Genetic Information

A range of information is provided on Angus bulls to assist with the selection of the bulls that are carrying the genetic package most aligned with the breeding objective of an individual breeding program.

Angus Australia conducts a monthly genetic evaluation using BREEDPLAN technology to generate Estimated Breeding Values (EBVs) for a range of economically important traits.

Angus BREEDPLAN EBVs consider pedigree, performance and genomic information that is available on a bull and/or its relatives to provide an estimate of the bull's genetic merit (or breeding value) for each trait.

The traits for which EBVs are calculated in Angus BREEDPLAN are outlined in Table 1.

In addition, four selection indexes are calculated for Angus bulls within the monthly Angus BREEDPLAN analysis, being the Angus Breeding Index, Domestic Index, Heavy Grain Index & Heavy Grass Index.

The four selection indexes assist producers using Angus bulls in making "balanced" selection decisions, taking into account the relevant growth, carcase & fertility attributes of each bull to identify animals that are most suitable for use within their particular commercial enterprise. The selection indexes calculated for Angus bulls reflect both the short term profit generated by an animal through the sale of their progeny, and the longer term profit generated by their daughters in a self-replacing cow herd.

A description of the four selection indexes calculated for Angus bulls is included in Table 2.

Identifying the Selection Index of Most Relevance
The first step when considering the genetic information that is provided on Angus bulls is to identify the selection index that is consistent with the breeding objective for the individual breeding program.

The Angus Breeding Index is a general purpose selection index that is suitable for use in the majority of commercial beef operations, whereas the Domestic, Heavy Grain and Heavy Grass selection indexes are specific to beef operations targeting a defined production system and

Table 1: Angus BREEDPLAN EBVs	
Birth	Calving Ease Direct Calving Ease Daughters Birth Weight Gestation Length
Growth	200 Day Growth 400 Day Weight 600 Day Weight Mature Cow Weight Milk
Fertility	Scrotal Size Days to Calving
Carcase	Carcase Weight Eye Muscle Area Rib Fat Rump Fat Retail Beef Yield Intrmuscular Fat
Feed Efficiency	Net Feed Intake (Post Weaning) Net Feed Intake (Feedlot)
Structural Soundness*	Front Feet Angle Front Feet Claw Set Rear Feet Angle Rear Leg Hind View Rear Leg Side View
Other*	Docility

Note: Currently Trial EBVs

market endpoint.

In general, the Angus Breeding Index will be the most appropriate selection index for use when selecting Angus bulls for use in northern Australian breeding programs.

If none of the selection indexes calculated on Angus bulls are deemed to be relevant, the development of a customised index using herd-specific production information and marketing goals should be considered. For further advice, contact staff at Angus Australia.

Ranking Bulls on Selection Index
Once the selection index of most relevance has been identified, the bulls available for selection can then be ranked on that particular selection index.

Table 2: Selection Index Descriptions			
Angus Breeding Index	**Domestic Index**	**Heavy Grain Index**	**Heavy Grass Index**
• Self replacing herd • Daughters are retained for breeding • Identifies animals that will improve overall profitability in the majority of commercial grass and grain finishing production systems	• Self replacing herd • Daughters are retained for breeding • Steer progeny finished on either pasture, pasture supplemented with grain, or grain targeting the domestic supermarket trade • Steer progeny slaughtered at a carcase weight of 270kg at 16 months of age • Eating quality traits important to suit MSA program	• Self replacing herd • Daughters are retained for breeding • Steer progeny pasture grown witha 200 day feedlot finishing period • Steer progeny slaughtered at a carcase weight of 420kg at 24 months of age • Target high quality, highly marbled markets with a significant premium for superior marbling	• Self replacing herd • Daughters are retained for breeding • Steer progeny finished pasture • Steer progeny slaughtered at a carcase weight of 340kg at 22 months of age • Eating quality traits important to suit MSA program

When ranking animals on a selection index, it is important to note:

- Angus selection indexes can only be used to rank bulls analysed within the Angus BREEDPLAN analysis. As with EBVs, the selection indexes calculated for animals in different genetic evaluations are not directly comparable.
- In addition to ranking the animals available for selection, producers can use selection indexes to benchmark where an animal ranks compared to other animals analysed within the Angus BREEDPLAN analysis by comparing its selection index value to the current breed average value and to the percentile table.

Current breed average and percentile table information for each selection index can be accessed from the online database facilities offered via the Angus Australia website (www.angusaustralia.com.au) and are routinely provided in sale and semen catalogues.

Consider Individual EBVs of Importance
Having ranked the bulls available for selection on the selection index of relevance, it is important to pay attention to each animal's EBVs to ensure they are carrying appropriate genetics for individual traits of particular importance in the breeding program.

For example, when selecting bulls for use in northern Australia breeding programs, producers may pay particular attention to:

- Higher 400 Day Weight & 600 Day Weight EBVs if trying to decrease the age of turnoff
- Higher Scrotal Size EBVs and lower Days to Calving EBVs if trying to improve weaning rates
- Moderate to positive Fat EBVs if trying to improve the ability of progeny to fatten earlier or to increase MSA compliance
- Higher 600 Day Weight, Carcase Weight, IMF & Docility EBVs if trying to increase eating quality and MSA Index
- Moderate Milk EBVs if trying to moderate milk production in a sire's female progeny

A simple way of considering an animal's individual EBVs, is to set acceptable ranges for the individual EBVs of particular importance. In this scenario, the bulls available for selection would initially be ranked on the selection index of relevance but any animal whose individual EBVs fall outside of the acceptable range would be excluded from selection.

Considering Genetic Conditions
Genetic conditions, or defects caused by DNA abnormalities, are present in all breeds of cattle. These conditions range from poor growth performance, structural unsoundness through to lethal conditions where all affected animals are not born alive.

The status of Angus bulls is routinely reported for several genetic conditions, including Arthrogryposis Multiplex (AM), Neuropathic Hydrocephalus (NH), Contractural Arachnodactyly (CA) and Developmental Duplications (DD).

The importance placed on the genetic condition status of an animal when selecting bulls for use in northern Australian breeding programs will depend on the genetics of the cow herd in which they will be used (in particular, whether carrier bulls have been used previously and consequently whether some females may be carriers) and whether some female progeny will be retained or sold as breeders.

As a general recommendation, only Angus bulls that have been tested free or calculated to be free of known genetic conditions should be considered for use in breeding programs in northern Australia. Irrespective of the breed, it is high risk to use bulls with an unknown status for genetic conditions.

Breeding Soundness
It is important that all bulls selected for use within a breeding program are sound and capable of getting their allocation of cows in calf within a given time frame. When evaluating bulls for soundness, it is important to focus on components that will adversely affect the function of the bull, and avoid the distractions of aesthetic features.

The recommended procedure for evaluating bulls is the Veterinary Bull Breeding Soundness Evaluation (VBBSE) examination as developed by the Australian Cattle Veterinarians. A full VBBSE assessment of an animal includes individual identification, history (including vaccinations) plus five key components, namely:
- A general physical examination including structure (conformation) and upper reproductive tract
- An examination of the testes and measurement of scrotal size
- Collection and assessment of a semen sample
- A serving assessment to evaluate libido and mating ability
- Laboratory examination of sperm morphology.

Where possible, Angus bulls should be sourced from seedstock breeders that are conducting VBBSE examination on all bulls prior to sale, including assessment of the first three components listed above. Evaluation of libido, mating ability and sperm morphology can be negotiated with the vendor and are particularly important for higher value bulls, or in intensive situations where bulls will be single sired mated or subject to heavier mating loads.

In situations where VBBSE is not provided prior to the point of purchase, it is important to assess bulls visually and/or consider any assessment of structural soundness that may be available. Information from independent assessment of structural soundness by an accredited assessor is often provided on Angus bulls.

Key considerations include assessment of:
- testicle size and consistency
- sheath
- hind leg structure
- front leg structure
- feet conformation

Further information on assessing breeding soundness is available from the Australian Cattle Veterinarians (ACV) website – www.ava.com.au/cattle.

Considering Other Traits of Importance
Other traits of importance that should also be considered when selecting Angus bulls for use in northern Australian breeding programs include:

- Coat and hide characteristics: Selection for bulls with slicker coats may improve their adaptability and performance post relocation, particularly in areas where there are high tick burdens or a very high heat load.

- Temperament: In all situations, only bulls with acceptable temperament should be selected.

- Other: Any other traits of importance specific to the individual breeding program should also be considered.

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