CRC FOR BEEF GENETIC TECHNOLOGIES

FACT SHEET

Selecting for Improved Temperament and the Benefits for Beef Production




FAST FACTS

- **There are many production benefits from breeding cattle with good temperament**
- **Temperament is heritable, so genetic progress is achievable**
- **Flight time is an objective and repeatable measure of temperament**
- **BREEDPLAN Flight Time or Docility EBVs are the preferred selection tool to genetically improve temperament in cattle**

Selecting cattle for improved temperament has multiple benefits for beef production and animal performance. Good temperament is associated with improved meat quality, feedlot performance, ease of transport and improvements in some reproductive traits.

How is temperament defined in cattle?

Temperament is the way in which an individual animal reacts to an unfamiliar or challenging situation. Temperament of an individual animal is a result of both its inherent temperament and its environment, including handling and training. It is therefore important to recognise that training may improve an animal's reaction in a familiar situation but may not overcome an animal's inherent reactions in unfamiliar environments.

Measuring temperament in cattle

Flight time was the primary measure used in Beef CRC research because it is an objective and repeatable measure of temperament. Flight time is the electronically recorded time taken for an animal to cover a fixed distance between 1.5m and 2.0m after leaving the weighing crush (see picture on next page). A longer flight time is associated with slower crush exit speed and better temperament. Flight time is best recorded early in an animal's life, for example at weaning before cattle have had much exposure to human handling but preferably after weaners have been through a race and crush once or twice to ensure reliable measures of the animal's reactions.

Flight time is a good measure of an animal's inherent or genetic temperament, rather than the experienced or learned aspect of temperament. Flight time is now included in BREEDPLAN evaluation as a Flight Time Estimated Breeding Value (EBV) to allow genetic improvement through selection. Flight time can also be used as a direct measure to assess the temperament of cattle entering feedlots or other intensive production systems such as artificial insemination programs.

Relationship between temperament and feedlot performance

Good temperate is associated with higher weights gains in feedlots for both tropically adapted and British breeds. Over several trials, daily weight gain in the feedlot for steers with the best temperament is approximately 0.4kg/day higher than steers with the worst temperament (Figure 1). Importantly, higher daily gain in the feedlot is also associated with higher final weights, heavier carcases and better feed conversion ratio.

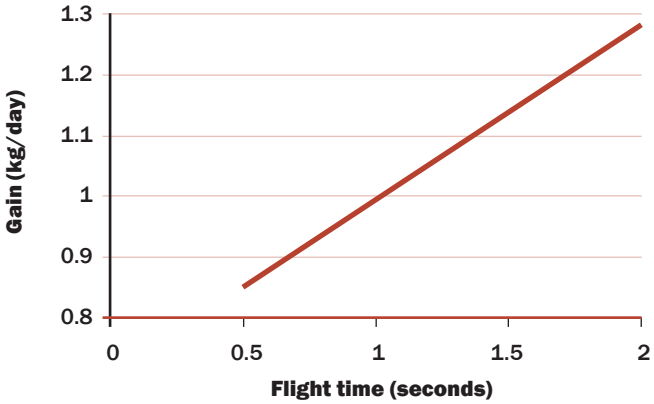

Figure 1: *Relationship between flight time and feedlot daily weight gain. As flight time increased so did average daily gain (ADG).*

Better temperament is also associated with better feedlot health. In a feedlot experiment a divergent group of nervous and calm British breed animals were selected on the basis of flight time and crush behaviour assessment. Over the 78 days in the feedlot no calm animal was "pulled" while 42% of nervous animals were taken to the hospital pen at some time. On average the nervous group grew at 1.04 kg/day whilst the calm steers grew at 1.46 kg/day.

Temperament and carcase attributes

Animals with poor temperament are more likely to produce progeny with beef of unacceptable eating quality. This is because stress depletes glycogen in nervous animals prior to slaughter, potentially resulting in dark-cutting meat or reducing the ability of the beef to age effectively post-mortem (see Beef CRC fact sheet titled "Producers can reduce dark cutting"). Moderate favourable genetic correlations also exist between improved temperament and meat quality. For tropically adapted animals, flight time had a favourable genetic correlation with MSA tenderness and MQ4 (overall acceptability) scores, meaning selection to improve flight time will also improve genetic merit for meat quality.

Temperament and transport weight loss

Tropically adapted cattle with better temperament lose less weight during long distance transport, plus regain lost weight more rapidly post-transport. In a Beef CRC trial, three groups of steers were transported 1365 km between Central Queensland and Armidale (a 4-5 day trip). Steers with the fastest flight times lost 5% more weight than steers with slowest flight times.

Temperament and fertility

There is no reason to expect significant relationships between temperament and male or female reproductive performance when animals in the breeding herd are grazed under extensive pastoral conditions. However, under intensive production systems such as artificial insemination (AI) or embryo transfer programs, there are likely to be relationships between temperament and performance. Australian research in tropically adapted cattle shows that docile heifers in an AI program demonstrate oestrus in the presence of an observer more often than their more temperamental contemporaries, though there was no difference in the number of heifers actually cycling. This means the docile animals are more likely to be inseminated at the correct time, thereby increasing their conception rates in AI programs that rely on observers to detect oestrus.

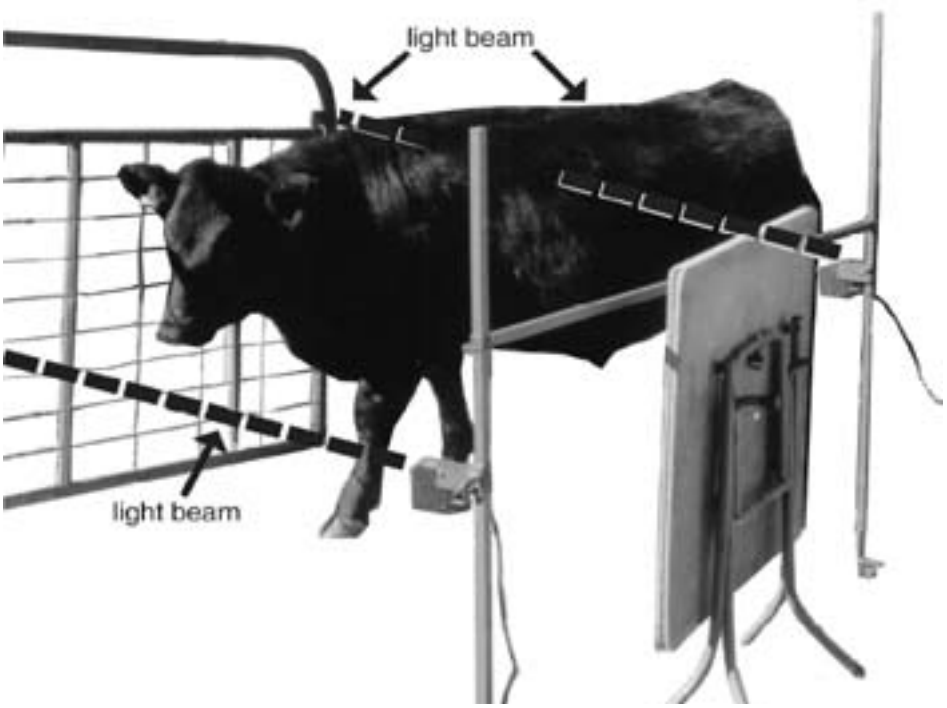

Figure 2: Flight time is the electronically recorded time taken for an animal to cover a fixed distance between 1.5m and 2.0m after leaving the weighing crush

Improving cattle temperament

Research consistently shows that temperament is moderately heritable; meaning selection to improve temperament will be effective. To improve temperament in the herd actively select bulls and breeding females with good temperaments and also cull animals with poor temperaments. Selection based on BREEDPLAN EBVs for Flight Time or Docility allows the most genetic progress to be achieved. In the absence of EBVs, using flight time as a measure of temperament early in life is useful. Equipment for measuring flight time in cattle is available on loan from local beef research and extension agents, or breed societies throughout Australia.

Related Beef CRC fact sheet

- Selecting temperament to improve beef tenderness, profits and feed efficiency
- Producers can reduce dark cutting

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