

# Temperament - Its Influence on Feedlot Performance and Meat Quality

## Genetic selection to improve temperament

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- The flightiness we regard as “bad temperament” is a natural survival instinct.
- Flightiness impacts on feedlot performance and eating quality of beef
- Flightiness can be scored by a crush test, yard test or flight time.
- Limousin breeders have used the crush test and the yard test to measure 17,000 animals since 1995.
- The EBVs calculated from these scores have allowed the Limousin breed to make genetic progress for docility.

### Temperament in cattle can be expressed in three forms:

1. Male behaviour – the aggressive behaviour of bulls to get rid of competitors and protect their group of females.
2. Maternal behaviour – the behaviour of cows to protect their young calves from predators.
3. Flightiness – the desire to run and jump when in a confined space.

All of these are natural survival instincts developed by cattle which ran wild for thousands of years. These traits allowed these animals to survive predators and the humans who hunted them.

### The keys to survival and the ability to reproduce were:

- Awareness of danger – strange noises or unusual visitors.
- Staying with the mob – don’t get isolated.
- Awareness of escape routes.
- Ability to run fast and jump high.
- Aggressive behaviour by bulls.
- Protection of young calves against predators by cows.

In the last 2000 years man has attempted to domesticate many species including cattle and 400 years ago we started to farm these animals.

To make these animals easy to manage we have attempted to breed out most of these survival traits. We want our cattle to be:

- Not frightened by strange noises and situations.
- Not worried about being separated from the mob.
- Not seeking escape routes.
- Not running fast and jumping high.
- Animals not to be aggressive towards humans.

### Flightiness causes:

1. **Increased production costs.** Flighty cattle are difficult to muster and handle.
2. **Increased risk of injury to man and beast.** There is increased risk to handlers and injury to animals if cattle are flighty.

### 3. Decreased feedlot performance.

There is a strong relationship between flight speed and feedlot performance. For tropically adapted cattle each 0.1 second increase in flight time increased average daily gain by 0.04 kg/day. Feed conversion efficiency is also lower for more flighty cattle.

In a CRC experiment in NSW 209 British breed steers were scored as nervous or calm prior to going into a feedlot. The nervous steers grew at 1.04 kg/day and the calm steers grew at 1.46 kg/day over 78 days in the feedlot.

No calm animals were pulled during the feedlot period whereas 42% of nervous animals were taken to the hospital pen at some time during the feedlot period.

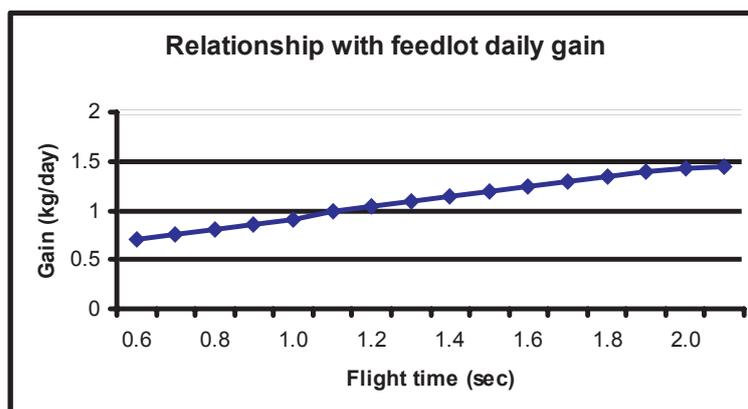


Figure1. Relationship with feedlot daily gain

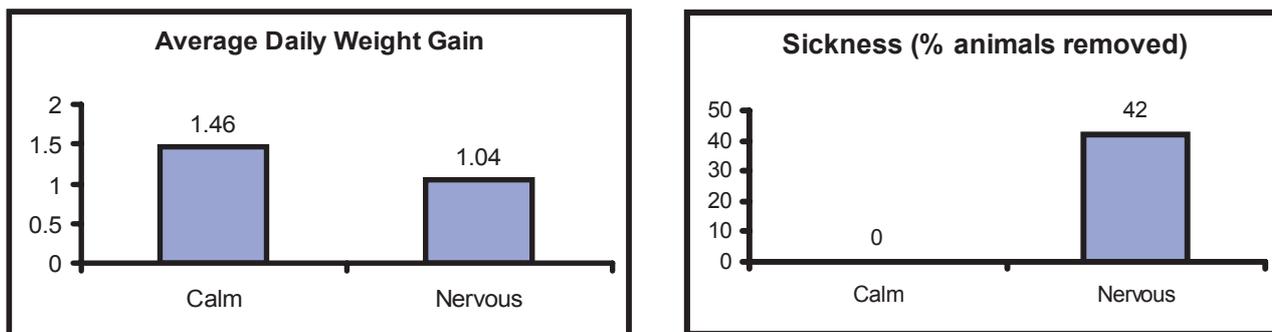


Figure 2. Comparisons of calm and nervous cattle - weight gain and sickness

**4. Greater weight loss in long distance travel and slower weight gain in recovery period.**

In CRC 1 three groups of tropically adapted weaners were transported from Emerald to Armidale which is a 1,365 km 4 - 5 day trip due to having to get clearance across the tick line.

Animals with the lowest flight time lost about 5% more weight during transit than the animals with larger flight times and gained weight more slowly during the one month recovery period.

This is quite significant for the live export trade, backgrounders and lot feeders.

**5. Decreased eating quality.**

Research in the CRC 1 straight breeding project showed that there is a strong genetic relationship between flight time and tenderness which has a large impact on eating quality as perceived by consumers.

The CRC 1 Project demonstrated a strong genetic relationship between flight time and tenderness or eating quality on tropically adapted cattle. See Figure 3.

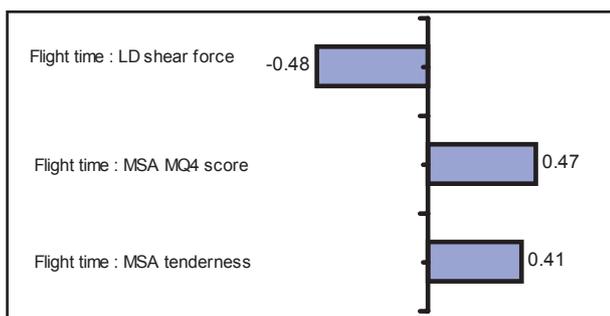


Figure 3. Genetic relationships of flight time and tenderness/eating quality. (Range -1.0 to +1.0)

**We can make cattle less flighty in two ways.**

1. By gaining the trust of the animals and making them familiar with handling facilities by handling and feeding as occurs in yard weaning.
2. By selection for genetically less flighty cattle.

Flightiness has a heritability of about 0.31 when the measure is either the subjective crush score/yard score or the objective flight time.

It is not sufficient to simply cull the bad ones because if you continue to use sires with the same range of docility you will make very little genetic progress. We need to use a scoring system on calves to tell us about the genetics for docility/flightiness of their dams and their sires.

Once we identify the sire and dam lines that are breeding more docile calves and the sire and dam lines that are breeding less docile calves we can start to make genetic progress by using only those dams and sires with good genetic docility.

**There are three ways of scoring the docility/flightiness of calves**

**1 Crush Test**

**Scoring** the behaviour of an animal when put into a crush using a 1-5 scale as our members do for Limousin calves.

**2. Yard Test**

**Scoring** the behaviour of an animal when put into a yard on their

own and a handler attempts to hold them in a corner. This test is used for calves that have had considerable handling and need to be put under more pressure to exhibit differences in behaviour.

**3. Flight Time**

The time taken to move between two light beams as it exits a crush. This test is suitable for large herds if the equipment is available.

All three are measures of the docility of an animal and all are correlated with each other.

**The Limousin Experience**

Limousin Society members have been scoring flightiness using the crush test and the yard test since 1995 and have now scored some 17,000 calves.

The problem with using raw scores to evaluate docility is that some cattle get a lot more handling than others before they are scored and each person who scores may score differently.

So we need to have a clever way of taking out the effects of prior handling and variation in scorers.

We do this by using all of the scores and pedigrees available to calculate Estimated Breeding Values (EBVs) for docility for sires, dams and their calves.

These scores were first used to calculate docility EBVs for sires in 2000.

Since 2002 docility EBVs have been calculated for sires, dams and calves. These EBVs are available from the Limousin website and this year most of the

animals in our National Sale and some private sales had EBVs for docility in the sale catalogue.

### **Has the Limousin Breed Made Genetic Progress?**

There are two measures of progress. The first is to compare the docility EBVs of the 20 most widely used sires for 1998 born calves with the 20 most widely used sires for the 2002 born calves.

The average docility EBV for the 20 most widely used sires in 1998 was +1.6 with 11 sires having negative EBVs.

The average docility EBV for the 20 most widely used sires in 2002 was +16.2 with only 3 sires with slightly negative EBVs. A large improvement.

There has clearly been a big improvement in the average docility EBV of the 20 most widely used sires and much lower use of very negative sires since 1998.

By calculating the average docility EBV for the calves born each year we can track the genetic change for the breed.

Figure 4 shows the genetic change for calves since 1990.

Note that there was very little change from 1990 to 1996 but since then the average docility EBV has increased from +0.5 for 1996 born calves to +4.4 for 2002 born calves.

### **References**

Beef the Future No. 11. CRC Report to Centre Sponsors, December 2002

Limousin Society Website, [www.limousin.com.au](http://www.limousin.com.au)

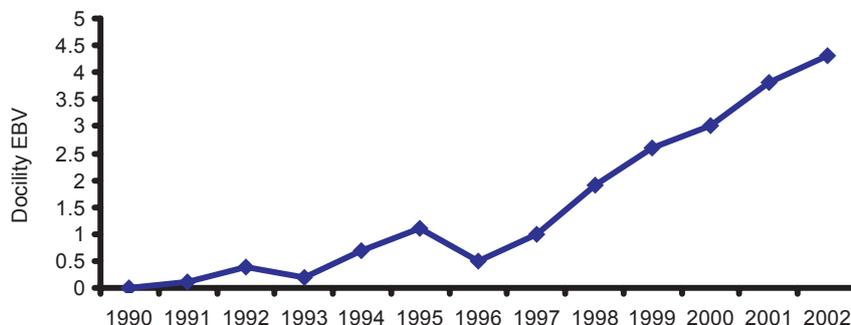


Figure 4. Genetic trend for calves