

Implementation of Chute Scoring in Beef Cattle

Introduction to temperament

Temperament is often described as an animal's behavioral response to handling by humans, or to any potentially fearful situation. The response of cattle to handling depends on

- Their reaction to or experience with humans
- Social context
- Physical environment
- “Newness” of the situation

Since these reactions are believed to be a response to fear, they are often linked with stress and are known to have various negative impacts on production and profitability.

The impact of temperament on production

As with any industry, economics weighs heavily on decision making processes. There are many aspects of the beef industry that can be impacted by temperament.

Pregnancy Rates

The main objective of any cow-calf operation is to produce one calf per cow annually, making reproductive performance the main driver of profitability. Excitable temperament in cattle can hinder reproductive performance by creating stress responses that disrupt the normal physiological processes associated with fertility. Using both live exposure as well as fixed time artificial insemination, Cooke et al. (2012) investigated the effect of temperament score on pregnancy rates in Angus x Hereford crossed cattle. Based on visual appraisals of their disposition, cattle were categorized as either adequate or aggressive in their temperament. The probability of cows becoming pregnant was negatively associated with temperament, with pregnancy rates in aggressive cattle being lower than in adequate cattle. Furthermore, calving rate was negatively associated with aggressive temperament.

Growth and Meat Quality

Cattle temperament also impacts growth, carcass composition, and meat tenderness. Excitable cattle not only have lower body weights, they have slower daily gains, and lower hot carcass weights, yield grades, quality grades, and marbling scores compared to their docile counterparts; they also have higher mortality rates.

The relationship between temperament and meat quality is of concern if payment based on meat eating quality rather than weight becomes more widespread. Busby et al. (2006) studied the effects of disposition during the feedlot period on gain and carcass quality. When considering the overall effects of disposition on quality and yield grade, feedlot gain, death loss, and treatment costs, docile calves returned \$62.19/head more than aggressive calves—and that was 14 years ago!

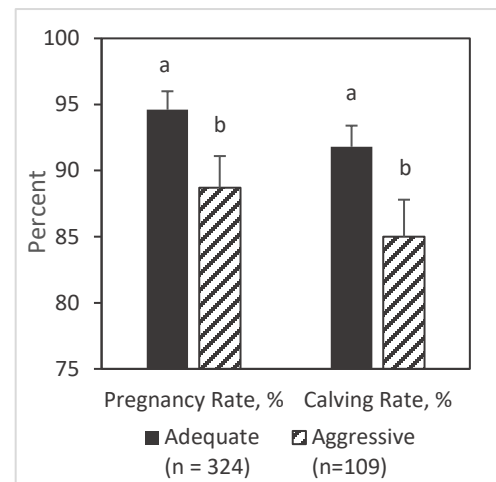


Figure 1. Comparison of the impact of temperament on pregnancy and calving rate in Angus x Hereford cows. Adapted from Cooke et. al. (2012). Adequate = Temperament score ≤ 3 , Aggressive = Temperament score > 3 .

Equipment and Safety

Ill temperament of an animal also may lead to injury to both the animal and its handler. In a working environment, a fearful response to handling can cause animals to struggle, show agitated movements, and attempt to escape, with greater risk of injury to the animals themselves, to their human handlers, and to other animals. Excitable animals also make the process of transporting or working a group of cattle slower and less efficient.

A description of chute scoring in beef cattle

The temperament of cattle can easily be assessed subjectively when animals are restrained in a chute. A six-point scale (1-docile; 6-aggressive) introduced by N. M. Tulloh (1961) is often used. Scores are assigned based on the amount of movement, vocalization, and restlessness as follows:

- 1. Docile:** Mild disposition. Gentle and easily handled. Stands and moves slowly during processing. Undisturbed, settled, somewhat dull. Does not pull on head gate when in chute.
- 2. Slightly Restless:** Generally docile but moves frequently and will not remain stationary for more than a few seconds; flicks tail occasionally, blows quietly through nostrils, may be stubborn but is otherwise docile.
- 3. Restless:** Quieter than average but may be stubborn during processing. May try to back out of chute or pull back on head gate. Some flicking of tail.
- 4. Nervous:** Typical temperament is manageable, but nervous and impatient. A moderate amount of struggling, movement, and tail flicking. Repeated pushing and pulling on head gate.
- 5. Flighty (Wild):** Jumpy and out of control, quivers and struggles violently. May bellow and froth at the mouth. Continuous tail flicking. Defecates and urinates during processing.
- 6. Aggressive:** Ranges from mildly aggressive behavior, fearfulness, extreme agitation, and continuous movement, which may include jumping and bellowing while in chute to thrashing about or attacking wildly when confined in small, tight places. Pronounced attack behavior.

With the introduction of hydraulic chutes, any restriction on the sides of the animal limits their movement making it difficult to differentiate among scores. Therefore, if using such equipment, the sides should be left “open” or widened when assigning chute scores.

When to assess temperament in cattle

Docility has higher reliability and heritability at a younger age (Burrow et al., 1988; Kadel et al., 2006). Evaluating young animals also ensures their behavioral response is less likely impacted by previous handling experiences.

Initial selection decisions are often made at weaning, coinciding with calves’ initial exposures to working facilities. This also is a good time to collect chute scores. Alternatively, such measures can be recorded when cattle are yearlings. However, based on their handling experiences, their temperament may have changed from weaning.

Acclimation to repeated handling

Cattle acclimate to repeated handling, with the timing and nature of those experiences having an impact. As demonstrated in Figure 2, more temperamental cattle at weaning (defined as those with higher chute scores), respond positively to gentle handling. These benefits persist over time as well. Animals do not, however, habituate to adverse experiences.

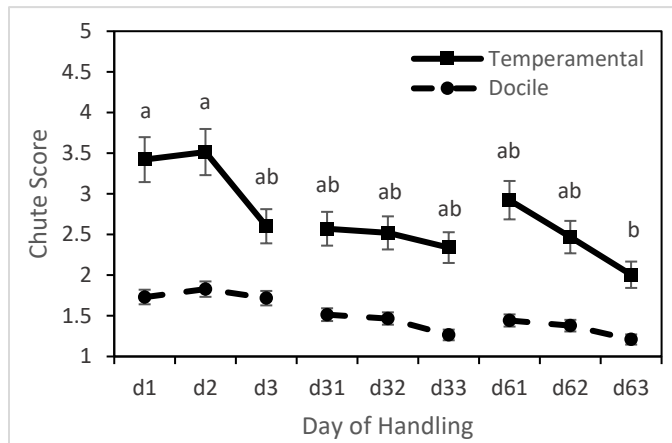


Figure 2. Change in chute score with repeated handling of calves following weaning (adapted from Parham et al., 2019). Docile = Average chute and exit score assignment on day 1 < 2.5, Temperamental = Average chute and exit score assignment on day 1 ≥ 2.5.

If temperament is a trait of interest in a breeding program, or if an animal is completely unmanageable, then culling based on the first observation is justified. This is especially true on a seedstock operation where animals are selected specifically for their breeding value. Environmental impacts that lead to acclimation are not passed down to progeny.

In a commercial setting, allowing acclimation to handling may be of value when balanced with overall producing ability. Cattle that excel in all other aspects of a producers breeding goal, but have borderline acceptable temperament, may benefit from additional observations before final culling decisions are made.

Using temperament as a selection criterion

With its moderate heritability, chute score is useful to select for more docile cattle. In 1998, the North American Limousin Foundation (NALF) implemented a docility Expected Progeny Difference (EPD) in their national genetic evaluation. The American Angus Association (AAA) followed suit in 2008. This EPD predicts the average docility of a bull or cow's offspring as compared to other animals, with higher numbers associated with calmer progeny.

In the commercial sector, EPDs can be used when selecting bulls. Combined with appropriate selection decisions on females, you would expect to see a calmer herd of cattle over time. Docility is often believed to be a threshold or "either-or" trait. As cattle move through the chute there is a mental assignment of "acceptable" and "unacceptable" that varies by producer. The rate of genetic gain achieved, however, depends on the accuracy and consistency of the selection and breeding decisions taken. The advantage of a formal and well-defined measurement like chute score, is that it is a quick, easy, and inexpensive methodology to consistently describe temperament. Such also is useful for producers who value docility but purchase commercial bulls without EPDs.

Ultimately, the threshold for acceptable temperament depends on the producer's breeding objectives and the location of their operation. Producers who raise cattle in the sandhills of Nebraska may have different preferences than those in southeast Nebraska, where risks of predation are less. Furthermore, in neither region, would producers want to make cattle so docile they become difficult to work through handling facilities. Seeking moderate docility in selection programs may be preferable, with that optimum defined by the sector of the industry being affected. This can be achieved by

consistent selection of bulls with moderate docility EPDs once an acceptable herd temperament is reached.

Literature Cited

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