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Temperament Does Not Affect Steer Weight Gains on Extensively Managed Semiarid Rangeland

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On the Ground

- Cattle with poor temperaments gain less weight in feedlots. However, how yearling steer temperament affects weight gain on rangelands is a knowledge gap for ranchers.
- Flight speed, the speed at which cattle exit a chute after weighing, has been used to measure temperament in past feedlot studies (faster speed = poor temperament). We used flight speed scores in this study to measure yearling steer temperament at the beginning (mid-May) and end (early-October) of grazing seasons for 3 years: 2011–2013.
- We hypothesized that steer weight gains on extensively managed semiarid rangeland with low stocking densities (~0.11–0.15 steers/ha) would not be influenced by temperament due to the much lower animal densities and fewer handling events than experienced in feedlots.
- No meaningful relationships were found between season-beginning or season-ending flight speed score and steer average daily gain, and flight speed scores were often lower at the end of the season.
- Results suggest that ranchers operating stocker enterprises with extensive management and low stocking densities on rangelands can potentially be less selective for temperament when assembling herds.

Keywords: cattle, flight speed, behavior, shortgrass steppe.

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Most ranchers have first-hand experience with differences in cattle temperament, from the cow that will blow her top when her calf is taken to be tagged, to the herd pet that needs a good scratch behind the ears before anything else can be done with the rest of the herd. Everyone likes their docile animals, as cattle with poor temperaments are not much fun to work and can even be dangerous to handlers. Beyond this added danger, cattle with poor temperaments can also have tougher meat[1,2] and reduced weight gains[2–4] in feedlots. As one example, cattle with poor temperaments gained 0.19 kg/hd/day (or 0.42 lb/hd/day) less than their counterparts with calm temperaments.[3] Temperament can clearly be an important consideration when assembling herds, not only from a safety standpoint[5] but also from an economic standpoint,[6] as lower weight gains and tougher meat would clearly affect bottom lines. Multiple factors, such as cattle breed,[3,7,8] genetics,[8,9] gender, and background,[8] can influence cattle temperament, so understanding such influences (and especially their relationship to beef production and quality) would clearly be valuable to ranchers.

To help make wise breeding and herd assembly decisions regarding temperament, the American Angus Association (www.angus.org) has maintained a docility Expected Progeny Difference (EPD) since spring 2008.[6] Although such resources exist and the effects of temperament on cattle performance in feedlots are well known, how yearling steer temperament affects weight gain on rangelands remains a knowledge gap for ranchers. On European pastures, less docile calves have been shown to have reduced weight gains,[8] but it still remains possible that when grazing extensively managed rangelands, the relationship between temperament and weight gains may differ from feedlots.

To test the relationship between temperament and yearling steer weight gains on semiarid rangeland, cattle chute-exit behavior was evaluated for 3 years (2011–2013) at the United States Department of Agriculture – Agricultural Research Service, Central Plains Experimental Range near Nunn, Colorado. Cattle "flight speed" or "exit speed" is one widely used method to study cattle temperament[8,10–12] and is simply the speed at which an animal exits a chute after handling (faster speed = poor temperament). For this study, we assigned flight speed scores[8,12] during weighing events of yearling steers. These data were used to test the hypothesis that steer

Table 1. Yearly data (independent of flight speed scores) for spring (April–June) precipitation and corresponding forage production (estimated from a representative study pasture), mean steer season-beginning weight, and mean steer average daily gain (ADG) at the Central Plains Experimental Range.

Year	Spring precipitation (mm)	Forage production (kg/ha)	Mean steer season-beginning weight (kg ± SD)	Mean steer ADG (kg/hd/day ± SD)
2011	164	814	271.4 ± 25.0	1.04 ± 0.16
2012	40	336	294.5 ± 29.1	0.75 ± 0.14
2013	119	730	277.7 ± 24.5	0.87 ± 0.14

weight gains on extensively managed semiarid rangeland would not be influenced by temperament due to the much lower animal densities and fewer handling events than experienced in feedlots. Determining if a relationship exists (or not) between steer temperament and weight gains on rangelands would help ranchers make more informed herd assembly decisions for stocker operations, which was one of the primary goals of this study.

Study Location, Facilities, and Methods

The Central Plains Experimental Range (CPER) is located about 12 km northeast of Nunn, in north-central Colorado. Mean annual precipitation is 341 mm; mean growing season (April–September) precipitation is 274 mm. The cattle handling facilities at CPER were designed and constructed by Grandin Livestock Handling Systems, Inc., Fort Collins, Colorado in 2003, following low-stress facilities principles.[13,14] For instance, the facility has a high-fenced, cornerless alley with a nonslip floor, and all handlers are trained to remain quiet and calm and to utilize "flight zone" and "point of balance" principles to move only small groups of steers through the facility at a time.[15] For season-beginning (mid-May) and season-ending (early- October) weighing events that were performed as a regular part of other grazing experiments, steers were gathered beginning at 3:00 p.m. the day prior to weighing and gathering was completed within 1 hour. Steers were then held overnight without feed or water in a corral that gave each animal four times the industry standard of ~1.9m^2 per animal.[13] Steers were individually weighed beginning at 8:00 AM the next day. To weigh steers and determine steer temperament, a Heavy Duty Extended Model Silencer hydraulic squeeze chute with a platform scale was used. At all stages of the gathering and weighing processes, cattle handlers used low stress cattle handling techniques.[15] All experimental protocols were approved by the CPER Animal Care and Use Committee.

Grazing Experiment and Flight Speed Scoring

All steers across study years (2011–2013; n = 1638) were *Bos taurus* and privately owned by ranchers in the Crow Valley Livestock Cooperative, Inc. New sets of steers from various producers were used each year. Steer color was recorded by the investigators each year for identification purposes, but color was not reliably equated to breed (breed information was not provided by ranchers). Study steers were all yearlings born the prior spring and the majority (~2/3) were black colored. Low stocking densities of ~0.15 steers/ha (0.06 steers/acre) were used in 2011 and 2012; this was reduced to ~0.11 steers/ha (0.045 steers/acre) in 2013 due to severe drought in 2012 (Table 1). For each year, steers were randomly placed in pastures that were either 65 or 130 ha at a moderate stocking rate of ~0.6 animal unit months per hectare (AUM/ha). Steers were continuously grazed for the entire grazing season (mid-May to early- October) and were weighed at the beginning and end of each grazing season to assess weight gains as a regular part of other grazing experiments. During the season-beginning weighing, steers were given a pour-on insecticide and an ear tag. Throughout the grazing season, steers were counted and visually examined for health issues at a distance from vehicles three times per week with minimal handling otherwise. Distances from study pastures to county roads, which bisect CPER, were similar and all pastures contained two-track trails around pasture perimeters.

Similar to prior studies, we used cattle flight speed scores as a measure of temperament.[8,11,12] The scores used were: 1 = walk; 2 = trot; 3 = run; 4 = jump.[8] These scores represented the speed at which the steers exited the chute and were assigned immediately after steer weight was recorded and the chute gate was opened. Steers were in the chute for less than 20 seconds on average. For all measurements, the observers were behind the chute opening, and no humans were in front of or directly beside the steers during chute release or scoring. When steers rarely fell out of the chute upon release at either the beginning or end of the season, these animals were excluded from the dataset (n = 24 total steers across years) because it was impossible to determine if agitation (or other factors, such as accidental loss of balance) caused the fall. This rating system was selected because it was easy to use and equipment was not available to measure actual flight speed.[10] However, the methods used here have been shown to be closely related to (and interchangeable with) actual flight speed, making them useful for determining temperament relationships to weight gain.[8,12] For all 3 study years, two observers (same two each year) assigned flight speed scores. Scores were immediately