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The effect of handler personality type on feedlot cattle behavioral responses[1]

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SUMMARY

The ability to readily identify individuals that may have a greater innate ability to handle cattle in a low-stress manner would be useful in feedlots and on ranches. This study was conducted to determine whether handler personality type would be a useful tool to predict stockman abilities. To accomplish this, 3 cattle handling exercises were created to observe human-cattle interactions. A scoring system was developed to investigate cattle handling proficiency based on cattle behavioral responses. Handler personality type was classified using two assessments. Some cattle handling exercises did not differentiate handler personality types. Introverted handlers tended to have higher scores than Extraverts in Exercise 3. When Exercises 2 and 3 were pooled, the same tendency occurred for Introverted handlers to have more favorable scores. These results indicate that a relationship between handler personality type and the behavioral responses of cattle may exist. The scoring system created to quantify cattle handling proficiency was useful, but needs further development.

INTRODUCTION

The cattle industry continues to promote the importance of low-stress handling because of the benefits on cattle performance and health. The benefits of low-stress handling also show up in the quality of the meat with a reduction of dark cutters and less trimming of bruises from the carcass. Additionally, minimizing stockman injuries is imperative for the success of an operation.

Cattle behavioral responses can vary widely when different individuals move cattle through facilities in preparation for processing or daily management tasks. This general observation raises the question whether the resulting cattle responses were due to the experience level, or training of the individual, or other personal characteristics. Since individual experiences are diverse, and may include poorly learned stockmanship skills or low performance expectations, it was necessary to look for indicators other than experience level. Personality type was investigated to classify stockman characteristics since personality type of an individual tends to be stable over time and influences many aspects of behavior and decision making.

The industry currently lacks a consistent method to assess cattle handling proficiency. This experiment created a scoring method to quantify the behavioral responses of cattle to use in investigating the differences between the abilities of handlers to effectively manipulate cattle.

MATERIALS AND METHODS

This experiment was performed at the Ruminant Nutrition Center, SDSU, Brookings, SD during August through September 2011. Cattle used were long yearling steers (n = 42 head) housed in 3 drylot pens (154 ft x 59 ft) with 14 steers per pen.

Twelve handlers with prior cattle handling experience were recruited for this experiment. The Myers-Briggs Type Indicator (MBTI) and the Virtues in Action Inventory of Strengths (VIA-IS) were chosen to classify personality type of the handlers.

Three exercises were created to directly observe human-cattle interactions without the use of equipment. Exercise 1 challenged the handler to get close enough to 4 predetermined steers with paint-brands on their left hip to read and record the identification on an ear tag. The intent being to measure a response when the personality type penetrated the animal's flight zone. Exercise 2 required handlers to manipulate cattle activity by more invasively penetrating the flight zone to sort the steers within their home pen into 2 equal groups that remained clearly separated by a nominal distance (16 ft), for at least 10 seconds. Exercise 3 involved handlers moving the steers out of the pen to a dead-end alley 262 ft to 459 ft from the pens. The handler then sorted back steers individually before returning them to the home pen.

Handlers performed the 3 exercises consecutively on 2 pens of steers, for 2 handling episodes per handler. The random assignment of handlers to pens was blind to personality type. Handlers were videotaped and 4 reviewers (3 beef cattle specialists and a graduate student) evaluated the footage. The initial cattle handling proficiency scoring system was comprised of 9 cattle behaviors: Attention, Fence contact, Curiosity, Excitability, Flight zone, Footing, Gregariousness, Movement, and Pace (Table 1).

Table 1. Cattle behavior descriptions for cattle handling proficiency scoring system.

Behavior	+3 Desirable	-3 Undesirable
	Cattle Response	
Attention	Toward handler	Away from handler
Fence contact	No contact	Occasional to continuous contact
Curiosity	Approach to investigate handler	Ignore handler, maintain normal/previous behavior
Excitability	Calm/relaxed, easy to handle	Nervous/stressed, difficult to handle
Flight zone[1]	Move away from handler at safe distance	Stay as far away from handler as possible
Footing	Sure footed	Fall
Gregariousness[1]	Maintain manageable, relaxed herd	Scattered, unmanageable herd
Movement	Maintain desired motion (or lack of motion) handler is working toward	Continuously uncooperative motion
Pace[1]	Relaxed/quick walk	Nervous/stressed run

[1]Behaviors removed from scoring system.

To minimize the conditioning of steers to the exercises, each pen was limited to 8 handling episodes with a maximum of 2 episodes per day. All handlers completed 1 handling episode before any handler began their second episode. The order of handlers was determined by schedule availability and arranged to prevent consecutive handling of a pen.

Each cattle behavior was assigned a score (+3, +2, +1, -1, -2, -3) that reflected the desirability of the cattle behavioral response. Positive scores were desirable cattle behavioral responses and negative scores were undesirable responses. Only cattle responses were used to quantify cattle handling proficiency. Handler actions/behaviors were not scored. This scale was converted to a six-point Likert scale for data analyses (-3 = 1 and +3 = 6). The individual cattle behavior trait scores comprising the scoring system were summed (Prelim SCORE) for each exercise giving a range from 9 to 56.

> Prelim SCORE = Attention + Fence contact + Curiosity + Excitability + Flight zone + Footing + Gregariousness + Movement + Pace.

The data were screened for potential biases caused by including highly correlated behaviors ($r > 0.70$) into the scores. When correlated behaviors were identified, the behavior that accounted for less variation in the statistical model was deleted. We presumed that if there were reviewer biases toward specific personality types, this would be reflected by a significant Reviewer x Personality type interaction. This interaction was evaluated in the statistical model after correlated behaviors were removed. Since the interaction was not significant ($P > 0.05$) for any of the 3 exercises, reviewer scores were averaged and the mean score (SCORE) was used in the final statistical model.

The effect of personality type on cattle behavioral responses was analyzed as a randomized block design using the GLM procedure. The block was Pen and Handler was the experimental unit representing a replication within Personality type. The model included the fixed effects of Personality type and Exercise, and the random effect of Pen with error = Personality type x Pen. Least squares means were calculated to separate Personality types within each exercise.

RESULTS AND DISCUSSION

The cattle behavior traits of Flight zone, Gregariousness, and Pace were found to be highly correlated with other behavior traits used in scoring, and were deleted from the model. The final model for scoring cattle responses was:
> SCORE = Attention + Fence contact + Curiosity + Excitability + Footing + Movement.

The possible range of the SCORE was 6 to 36.

The audit of the exercises led to the removal of Exercise 1 from further evaluation because the full range of scores (1 to 6) for cattle behaviors were not observed, and Exercise 1 did not differentiate personality types. The full range of cattle behavior scores were observed within Exercises 2 and 3. Personality types explained approximately 40% of the variation in scores.

Personality type of the handlers was not normally distributed. Given the small sample size, not all types were available to be tested. Handlers used in this study were more Introverted than Extraverted, more Sensing than Intuitive, more Thinking than Feeling, and more Judging than Perceiving in the MBTI assessment (Table 2). Since there was only one Intuitive handler, the S/N dichotomy could not be tested. The VIA-IS showed limited potential as a useful classification of handlers in this study due to the small

sample size and large number of personality classifications. In studies with larger sample sizes the VIA-IS assessment may potentially prove to be useful.

Table 2. MBTI personality type distributions[1]

Personality type	Handlers	Handler population
	n	%
I/E dichotomy		
Extrovert	4	34
Introvert	8	66
Total	12	100
S/N dichotomy		
Sensing	11	92
Intuition	1	8
Total	12	100
T/F dichotomy		
Thinking	7	58
Feeling	5	42
Total	12	100
J/P dichotomy		
Judging	8	66
Perceiving	4	34
Total	12	100
Temperament		
Intuition & Feeling	0	0
Intuition & Thinking	1	8
Sensing & Judgment	7	58
Sensing & Perceiving	4	34
Total	12	100

[1]Myers-Briggs Type Indicator Profile, Form M, 2004.

The effect of Exercise on the SCORE was significant. MBTI personality types did not differentiate handlers in Exercise 2 ($P \geq 0.20$, Table 3). Although Exercise 2 did not differentiate handlers, the scoring system still explained 39% of the variation in the SCORE. Introverts tended ($P = 0.07$) to have higher SCORES than Extraverts in Exercise 3 (Table 4). Introverts also tended ($P = 0.08$) to have higher SCORES than Extraverts when Exercises 2 and 3 were pooled (Table 5). A trend existed for Judging types to have higher SCORES than Perceiving types. The same trend existed for Thinking over Feeling types and SJ types over SP types. Exercise 3 alone, and Exercises 2 and 3 pooled, tended to differentiate handler personality types using the SCORE. Pooling Exercises 2 and 3 raised the explained variation in the SCORES to 49%. Directly observing the behavioral responses of feedlot cattle, as quantified by the SCORE, may be a useful measure of cattle handling proficiency. However, the exercises may not create enough differentiation between personality types to draw definite conclusions about stockman handling abilities. Also, the cattle used in this study were already conditioned to handling, so this could have limited separation of scores. Further research is needed to determine the pertinent cattle handling exercises and cattle behaviors to include in a cattle handling proficiency scoring system.

Table 3. Effects of handler MBTI personality types on SCORE for Exercise 2

Item	Personality Type			r^2	P-value[1]
I/E dichotomy	Introvert	Extravert			
Handlers[2]	8	4			
SCORE[3]	31 ± 1.2[4]	29 ± 1.7		0.63	NS[5]
T/F dichotomy	Thinking	Feeling			
Handlers[2]	7	5			
SCORE[3]	31 ± 0.8	30 ± 1.0		0.42	NS
J/P dichotomy	Judging	Perceiving			
Handlers[2]	8	4			
SCORE[3]	31 ± 0.8	30 ± 1.2		0.39	NS
Temperament[6]	NT	SJ	SP		
Handlers[2]	1	7	4		
SCORE[3]	—[7]	31 ± 0.7	30 ± 0.9	0.40	NS

[1]Probabilities calculated using personality type x pen as an error term.

[2]Each handler tested on 2 pens of steers.

[3]SCORE = Attention + Fence contact + Curiosity + Excitability + Footing + Movement.

[4]Least squares means ± SEM.

[5]NS = $P \geq 0.20$.

[6]NT = Intuition & Thinking, SJ = Sensing & Judging, SP = Sensing & Perceiving.

[7]Inestimable.

Table 4. Effects of handler MBTI personality types on SCORE for Exercise 3

Item	Personality Type			r^2	*P*-value[1]
I/E dichotomy	Introvert	Extravert			
Handlers[2]	8	4			
SCORE[3]	29 ± 0.4[4]	26 ± 0.6		0.47	0.07
T/F dichotomy	Thinking	Feeling			
Handlers[2]	7	5			
SCORE[3]	28 ± 0.9	27 ± 1.0		0.41	NS[5]
J/P dichotomy	Judging	Perceiving			
Handlers[2]	8	4			
SCORE[3]	29 ± 0.4	27 ± 0.6		0.41	0.12
Temperament[6]	NT	SJ	SP		
Handlers[2]	1	7	4		
SCORE[3]	—[7]	28 ± 0.4	27 ± 0.6	0.43	0.13

[1]Probabilities calculated using personality type x pen as an error term.
[2]Each handler tested on 2 pens of steers.
[3]SCORE = Attention + Fence contact + Curiosity + Excitability + Footing + Movement.
[4]Least squares means ± SEM.
[5]NS = $P \geq 0.20$.
[6]NT = Intuition & Thinking, SJ = Sensing & Judging, SP = Sensing & Perceiving.
[7]Inestimable.

Table 5. Effects of handler MBTI personality types on the SCORE for Exercises 2 and 3 pooled

Item	Personality Type			r^2	*P*-value[1]
I/E dichotomy	Introvert	Extravert			
Handlers[2]	8	4			
SCORE[3]	30 ± 0.4[4]	28 ± 0.6		0.54	0.08
T/F dichotomy	Thinking	Feeling			
Handlers[2]	7	5			
SCORE[3]	30 ± 0.6	29 ± 0.7		0.49	NS[5]
J/P dichotomy	Judging	Perceiving			
Handlers[2]	8	4			
SCORE[3]	30 ± 0.5	28 ± 0.7		0.50	NS
Temperament[6]	NT	SJ	SP		
Handlers[2]	1	7	4		
SCORE[3]	—[7]	30 ± 0.4	28 ± 0.6	0.51	0.17

[1]Probabilities calculated using personality type x pen as an error term.
[2]Each handler tested on 2 pens of steers for each exercise.
[3]SCORE = Attention + Fence contact + Curiosity + Excitability + Footing + Movement.
[4]Least squares means ± SEM.
[5]NS = *P* ≥ 0.20.
[6]NT = Intuition & Thinking, SJ = Sensing & Judging, SP = Sensing & Perceiving.
[7]Inestimable.