DIFFERENCES IN RANGELAND USE PATTERNS OF YOUNG COWS WITH DIFFERENT STRESS COPING STYLES: PRELIMINARY RESULTS

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Introduction
Individuals in most animal groups exhibit consistent behavioral differences within or across situations (feeding, mating, predator avoidance, etc.) known as behavioral syndromes (Silis et al. 2004). Proactive (more nervous) vs. reactive (calmer) behavioral syndromes have been observed in many animal species and have been shown to influence how individuals cope with stress (Koolhaas et al. 1999). A cow’s response to stressful situations (such as individual confinement), could be indicative of a suite of behaviors which could be associated with distinct rangeland use patterns and consequent animal production levels. To date, no research has been conducted that relates behavioral syndromes of rangeland-raised livestock with landscape use and animal performance.

Objective
Our objective was to describe the relationships between animal stress coping style, patterns of rangeland use, and performance of rangeland-raised beef cows.

Materials & Methods
Thirty-six 3-year-old cows were classified into two groups on the basis of their stress coping style. Multiple criteria were used to classify individuals into such groups using Cluster Analysis and Discriminant Function Analysis (Table 1; Figure 1). Cows were tracked with Lotek® GPS collars (Lotek Wireless, Newmarket, ON) for approximately 45 days during the calving seasons of 2006 and 2007. Eighteen cows were tracked in each season. Randomly selected calves were fitted with lightweight, custom built, GPS collars containing Garmin Legend® GPS units (Garmin Inc. USA) during the 2007 season. A number of cow and calf production parameters were measured on each individual (Table 1).

Table 1: Suite of variables measured on each animal

Table: Means and SE of variables used to classify cows into groups based on stress copying styles

Results
Figure 2: Mean serum cortisol levels of cows classified as proactive and reactive. Means were statistically different (P<0.05).

Figure 3: Relationship between supplement feeding rate in confinement (which was used as a proxy for stress coping style) and pasture use of young cows

Figure 4: Example of the daily area explored by a reactive and proactive cow (23 March 2006). Shaded areas represent 95% kernel volume density estimates.

Conclusions
Our results strongly suggest that behavioral syndromes do exist in range beef cattle and that cattle distribution and production may be influenced by these behavioral constraints.

Cows classified into the reactive and proactive behavioral syndrome groups showed differences in productivity and pasture use patterns.

Stress coping style could eventually be used as an additional herd selection criterion to achieve specific landscape use and livestock production objectives on rangelands.

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