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Does disposition affect reproductive performance in beef cattle?

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This is the time of year that many Florida producers have made decisions on which heifers to market and which to keep for replacements. Heifer or cow disposition is a commonly considered selection criteria for replacement selection. Disposition is characterized as the animal's reaction to common handling procedures and contact with humans, and can be assessed by different methods. At the Range Cattle REC in Ona, three methods are used to characterize the disposition of the research cowherds:

Chute score: Observation of animal behavior when restrained in the chute. This score ranges from 1 to 5 (very calm to very agitated, respectively)

Exit score: The speed at which the animal leaves the chute is measured. Following that, velocities are ranked and animals are scored from 1 to 5 (slowest to fastest, respectively).

Pen score: Animal response to human presence in the pen after leaving the chute. This score also ranges from 1 to 5 (calm to aggressive behavior, respectively).

After all measurements are assessed, an overall disposition score is assigned to each animal, which is a combination of 1/3 of each individual measurement and is also referred to as a temperament score. A greater temperament score is reflective of a cow with a poor disposition. Animals with poor temperament are usually under a considerable amount of stress, which may significantly affect the animal's physiology. Blood concentrations of hormones associated with stress, such as cortisol, are usually increased in animals with poor temperament. Some authors have reported negative impacts of stressful situations on cattle reproduction, and this effect may be attributed to the altered physiology of stressed animals. Few controlled research studies have associated temperament with reproduction in beef cattle. In contrast, several field observations have

related poor temperament with impaired reproductive performance. The negative effects of stress and disposition on reproduction can be even more pronounced in cattle with Brahman breeding influence, which are often characterized as having a poorer temperament compared to *Bos taurus* breeds.

These initial research efforts center around our hypothesis that cow temperament will be improved through acclimation toward human presence and also to the handling and management procedures of a common beef cattle operation. Since cattle in Florida have a high Brahman-influence, and reproductive performance is one of the most important factors for the overall efficiency of the cow-calf enterprises, it is our interest to investigate how cattle temperament may affect cowherd reproductive ability. Therefore, two studies were conducted to evaluate the effects of disposition and acclimation on the reproductive performance of mature cows and developing heifers. The results of these studies are summarized in this article.

Study 1

Effects of disposition and acclimation on reproductive development of Brahman-crossbred heifers. This study was conducted from August 2006 to February 2007. Growth, puberty attainment and pregnancy rates of 40 developing Braford and Brahman x Angus heifers were assessed. After weaning (August 2006), half of these heifers went through an acclimation process, whereas the other half remained within normal production conditions. Acclimation consisted of bringing heifers to the cowpens three times per week during a one month period. Disposition scores and blood samples of heifers from both groups were collected prior to and at the end of the acclimation period. Puberty attainment was monitored monthly via ultra-sound and blood progesterone concentrations until the beginning of the breeding season (January 2007). As a result of this research, heifers from the acclimated group were observed to have a decreased average daily gain compared to non-acclimated heifers (0.91 vs. 1.15 lbs/day, respectively). We attribute this response to the additional exercise that acclimated heifers were exposed to during the frequent walking to and from the working facility. This is likely the reason for the difference since both groups were provided similar pastures and supplements. Despite the slight decrease in body weight gain, heifers from the acclimated group reached puberty at least 1 month sooner than non-acclimated heifers, and had numerically greater pregnancy rates (69 vs. 61%, respectively). After the acclimation process, no differences in disposition scores were observed between treatments, but decreased cortisol concentrations were observed in acclimated heifers (3.91 vs. 5.68 ug/dL, respectively). In addition, when analyzing data combined from both groups, heifers that attained puberty during the experiment were the ones with decreased overall cortisol concentrations (5.08 vs. 3.90 ug/dL for non-pubertal and pubertal heifers, respectively) and a greater numerical decrease in disposition score after acclimation (-0.32 vs. 0.01 for pubertal and non-pubertal heifers, respectively). From this experiment we concluded that disposition, acclimation, and the physiological processes associated with cattle temperament may significantly affect reproductive performance, and acclimation may enhance reproductive development of growing Brahman-crossbred heifers.

Study 2

Effects of disposition and acclimation on reproductive performance of mature Brahman-crossbred cows. A similar study was conducted with Braford and Brahman x Angus mature cows. After weaning (August 2006), disposition scores and blood samples were collected from 400 cows. From September 2006 to December 2006, half of these cows were subjected to an acclimation process, whereas the other half remained within normal production conditions. For cow acclimation, the same technician interacted with the cows twice weekly by walking among them and offering a small amount of range cubes. The amount of range cubes offered was too little to impact the cows nutritionally (200 grams/week). On January 2007, prior to the beginning of the breeding season, disposition scores and blood samples were collected a second time. As a result, there were no differences between treatments for disposition scores, cortisol concentrations and pregnancy rates. However, when analyzing data combined from both groups, cows that became pregnant during the study had better temperament scores at the beginning of the breeding season compared to cows that did not become pregnant (2.09 vs. 2.45 for pregnant and non-pregnant cows). In addition, pregnant cows had a greater decrease in temperament scores after the acclimation period compared to non-pregnant cows (-0.34 vs. 0.02 for pregnant and non-pregnant cows). From this experiment, we concluded that cow disposition significantly affects reproductive performance; however, the acclimation procedures imposed to cows in this experiment did not have the expected effect.

This study will be repeated in the coming fall and winter and our combined findings will be reported next year. For questions regarding this and other research and extension education efforts, please contact us at <http://rcrec-ona.ifas.ufl.edu/> or 863-735-1314.