Influence of modified 2-point temperament score on AI pregnancy in beef heifers
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Temperament is described as the reacting characteristics of cattle when exposed to human handling. Excitable temperament has been alleged to have detrimental effects on both production and reproduction parameters. The objective of this study was to evaluate the effect of temperament, determined by chute exit and gait, on artificial insemination (AI) pregnancy rates in beef heifers following fixed time A.I. The hypothesis was excitable temperament will lower AI pregnancy rates. Angus cross beef heifers (N=947) at eight locations were the subjects in this study. At the initiation of synchronization (Day 0), all heifers received a body condition score (BCS; 1=emaciated; 9=obese), and temperament score (0=calm; slow exit and walk); (1= excitable; fast exit or jump or trot or run). Heifers were synchronized with 5-day CO-Synch+ controlled internal drug release (CIDR) protocol. Blood samples were collected at both the instigation of synchronization and the time of AI for cortisol measurement. Briefly, all heifers received a CIDR (Eazi-Breed® CIDR® Cattle Insert; Pfizer Animal Health, New York, NY) on Day 0. At each farm, heifers were randomly divided into two groups: one group received 100µg of gonadorelin hydrochloride (GnRH; Factrel®, Pfizer Animal Health), while the other group received no treatment at the time of CIDR insertion at Day 0. On Day 5, CIDR inserts were removed and all heifers received 25 mg of prostaglandin Fα (PGF; Lutalyse® sterile solution; Pfizer Animal Health). The GnRH and no treatment groups were further divided into 1PGF and 2PGF groups. The heifers in the 2PGF group received a second dose of PGF six hours after the initial injection. All heifers were inseminated 56 hours after CIDR removal, and received 100µg of GnRH at this time. Two weeks later, intact Angus bulls were placed with the heifers (approximately 1:40 to 1:50 bull:cow ratio) across all treatment groups. The bulls were left with the heifers for the remainder of the 60 to 70 day breeding season. Heifers were examined for pregnancy via ultrasound 70 days after AI to determine the time of conception. The data were analyzed using PROC MIXED procedure of SAS (SAS Version 9.3, Cary, NC). The variables included were as follows: synchronization treatments, exit score (excitable versus calm), locations (1 to 8), BCS (≤ 6 vs. > 6), and 2-way interactions. Artificial insemination sires and AI technicians were offered as random effect in the model. The P value was set at > 0.1 for exclusion and α ≤ 0.05 for significance.

The proportion of heifers determined to have excitable temperaments varied across locations (27.9 to 78.9%; P<0.01). Accounting for locations (P=0.06), synchronization treatment (P=0.03), and location by exit score interaction (P<0.01), the heifers with excitable temperament had lower AI pregnancy compared to heifers with calm temperament (51.9 [331] vs. 60.3% [636]; P=0.006). The AI pregnancy rates ranged from 50.3 to 58.3% for synchronization treatments. The AI pregnancy for locations varied from 50 to 62.4%. Blood serum cortisol concentration between calm and excitable heifers significantly differed at the initiation of synchronization (4.43 and 5.43 ng/mL) and did not differ at AI (4.11 and 4.2 ng/mL). Inter- and intra rater agreement for exit scoring were moderate and good (Kappa=0.596 and 0.797, respectively). The predictive value for calm and pregnant was 0.87, and excited and pregnant was 0.76.

In conclusion, heifers with excitable temperament lowered AI pregnancy rates in the beef operation. The modified 2-point temperament scoring method can be used to accurately identify heifers with excitable temperament.

Keywords: Beef heifers, temperament, exit score; AI pregnancy