Breeding soundness of weaned bull calves treated with bolus injections of trace minerals
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Young bulls that fail to pass a breeding soundness examination (BSE) represent a financial loss to cattle breeders. We hypothesized that two bolus injections of trace minerals would increase the proportion of bulls assigned satisfactory BSE scores. Weaned, 7-mo-old bull calves (n = 491; initial BW = 314 ± 45 kg) of 3 breeds (Charolais, Angus, and Charolais × Angus) and originating from 12 ranches in the Great Plains and intermountain west were blocked by breed type and ranch of origin and assigned randomly at the beginning of the study (D0) to 1 of 2 treatment groups: 1) supplemental s.c. trace mineral injection containing 15 mg/mL Cu, 10 mg/mL Mn, 5 mg/mL Se, and 60 mg/mL Zn (TM) or 2) s.c. injection of physiological saline (SA). Injections (SA or TM) were administered at weaning (D0; 1 mL/45 kg BW) and again 90 D after weaning (1 mL/68 kg BW). Bulls were fed a growing diet ad libitum at a common location for 225 d. The diet consisted of ground hay, corn silage, corn grain, SBM, macro-minerals, and trace-minerals and was formulated to promote a 1.5 kg ADG at a DMI of 2.6% BW (DM basis). Initial weights and blood samples via caudal vessel puncture were collected on D0. Semen samples were collected on D90 and D150 by electroejaculation. Scrotal circumference was measured and semen samples were evaluated by a single technician. Breeding soundness classifications as approved by the Society for Theriogenology were assigned by a licensed veterinarian. Initial blood serum samples were analyzed for Cu, Mn, Se, and Zn concentrations. Bulls with initial serum Se < 70 µg/kg were more likely (P = 0.03) to fail the BSE on D90 than contemporaries with serum Se > 70 µg/kg (48 vs 52% respectively). Scrotal circumference did not differ (P ≥ 0.27) between treatments and averaged 34 ± 2.9 cm on D90 and 37 ± 2.7 cm on D150. Proportions of TM- and SA-treated bulls receiving satisfactory BSE scores were not different (P ≥ 0.54) on D90 (49 vs 49 %, respectively) or D150 (89 vs 86 % respectively). Conversely, motility scores were greater (P = 0.06) for TM-treated bulls on D150 than for SA-treated bulls (88 vs 86 %, respectively). During the development period, ADG differed (P < 0.01) between ranch of origin and breed but not (P = 0.96) between treatment groups. In summary, bulls with relatively-low initial serum Se were more likely to fail BSE. Cumulative BSE scores of young bulls given bolus injections of TM were not different from those given bolus injections of SA; however, sperm motility on D150 was greater for bulls treated with TM than bulls treated with SA.

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