EFFECTS OF SELENIUM SUPPLEMENTATION ON CATTLE ANTI-RABIES HUMORAL IMMUNE RESPONSE AND LEVELS OF SERUM SELENIUM AND CORTISOL


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ABSTRACT: This study evaluated the effect of different concentrations of selenium (Se) supplementation on cattle anti-rabies humoral immune response, serum Se concentrations and cortisol levels. Sixty uncastrated male Nelore calves from 10 to 12 months grazing on Brachiaria decumbens forage were studied. The animals were assigned to one of four groups (n = 15 each), which received non-supplemented diets (Gc) or supplemented with daily and individual Selenium (Se) concentrations of 3.6 mg (G3.6), 5.4 mg (G5.4) or 6.4 mg (G6.4). The calves were immunized on day 0 with one dose of commercial liquid inactivated rabies vaccination. On days 15, 30, 60, 90 and 120, the cattle underwent the same stressing procedures used for vaccination in the corral. Cattle blood samples were collected after vaccination and stressing procedures to determine serum Se levels, rabies antibody titers and serum cortisol. Se concentration in B. decumbens was 0.04 mg of Se/kg dry matter. Baseline Se levels obtained on day 0 were higher in Gc than in G5.4 and G6.4 (P = 0.005). Serum Se levels decreased in Gc throughout the experiment (P < 0.004), increased in G3.6 (P < 0.000) and G5.4 (P < 0.000) and were kept high from day 60 on in group G6.4 (P < 0.002). Rabies antibody titers did not differ among control and supplemented groups. However, 120 days after vaccination rabies antibody titers were kept above protective levels (≥ 0.5 UI/mL) only in group G3.6 (P < 0.00002), whereas they dropped in the other groups (P < 0.05). Serum cortisol levels did not differ among the experimental groups (P = 0.79), reached peak levels on day 90 and returned close to baseline levels on day 120. Se and cortisol levels were not markedly correlated. Serum cortisol and rabies antibody titers were correlated only in group G6.4, on day 60 (R = 0.513; P = 0.05) and 120 (R = 0.644; P = 0.009). Serum Se and rabies antibody titers were correlated only in group G6.4, on day 60 (R = –0.580; P = 0.023). In conclusion: a) the profile of Se variation is different among groups receiving different concentrations of this element; b) the supplementation dosage of 3.6 mg Se/animal/day is efficient to treat/prevent marginal Se deficiency; c) individual supplementation with daily concentrations of 3.6 mg Se enhances the maintenance of rabies antibody titers in cattle; d) individual supplementation with daily concentrations of 3.6; 5.4 and 6.4 mg Se are ineffective in reducing serum cortisol; e) repeated cattle handling in corrals stress animals that adapt to these procedures, although serum cortisol does not return to baseline levels by 120 days; and f) the stress generated by repeated management in cattle in the corral does not diminish antibody titers after vaccination against rabies.
KEY WORDS: selenium, rabies antibodies, cortisol, mineral supplement, bovine.

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