SELENIUM SUPPLEMENTATION MAINTAINS PROTECTIVE RABIES ANTIBODY TITERS IN NELORE CATTLE

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We studied the effects of dietary Selenium (Se) supplementation on the humoral immune response of cattle after primo-vaccination against rabies. Sixty male, uncastrated Nelore (Bos taurus indicus) calves (~ 12 mo) grazing on Se-deficient pasture were immunized with one dose of liquid inactivated commercial rabies vaccine. The cattle were divided into 4 groups (N=15 each) that fed diets supplemented with 0 (Gc), 3.6 (G3.6), 5.4 (G5.4), or 6.4 (G6.4) mg Se/day. Blood samples were collected on days 0, 30, 60, 90 and 120 and determination of rabies neutralizing antibody titers by rapid fluorescent focus inhibition test and serum Se levels by graphite furnace atomic absorption spectrophotometry. Antibody titers were similar among the groups (Kruskal-Wallis test, P>0.05) although the groups had different profiles of titer persistence over the course of the experiment (Friedman test, P< 0.05). Considering that immunity against rabies is achieved with antibody titers ≥0.5 IU/mL, only cattle from G3.6 were protected throughout the experiment. Antibody titers decreased drastically in Gc and more moderately in G5.4 and G6.4, but none of these groups was protected against rabies 60 days after vaccination. On day 120, most cattle of Gc (73%), G5.4 (60%) and G6.4 (80%) were unprotected, whereas 53.3% of G3.6 were protected. Gc had marginal Se deficiency on day 120 (81.08±40.92 µg Se/L), suggesting that it compromises the humoral response of cattle to rabies vaccination. In opposition, the high serum Se levels determined in G5.4 (95.37 ± 37.89 µg Se/L) and G6.4 (87.65 ± 31.22 µg Se/L) were more than 180% above the recommended level. In G6.4, serum Se levels and antibody titers were negatively correlated on day 60 (Spearman's Correlation, $r_s = -0.580; P= 0.023$), which suggests compromising of the anti-rabies immune response. In conclusion, daily oral supplementation of cattle with 3.6 mg Se promotes the persistency of rabies neutralizing antibody levels whereas the other concentrations tested are excessive and may even cause immune suppression.