**Immune response**

We also analyzed one of several acute-phase proteins called haptoglobin (an indicator of inflammatory response after stress or immunological challenge) and observed that S3 steers had greater plasma haptoglobin concentrations (0.78 versus 0.53 ± 0.041 mg/mL; P = 0.002) compared to S7 steers. This response supports the hypothesis that reducing the frequency of supplementation enhances the stress response of weaned calves.

In addition, we analyzed the percentage of calves responding to vaccination (seroconversion) and the production of antibody titers against bovine viral diarrhea virus type 1b (BVDV-1b). Although the percentage of calves responding to the vaccination did not differ between treatments (P = 0.26), S7 steers had greater (P = 0.03) antibody titers against BVDV-1b than S3 steers (Figure). Further studies need to be conducted to evaluate if this greater antibody titer production can increase the immune protection of those calves. However, it is possible that the immune response of weaned steers receiving daily energy supplementation was enhanced, which might result in greater immune competency against a pathogen invasion.

The reason for the greater antibody response is not known, but it could be associated with less fluctuation on nutrient intake and synthesis of hormones and metabolites. Hence, our data indicate that the constant nutrient intake and synthesis of hormones and metabolites due to daily energy supplementation seems to benefit not only puberty achievement (Cooke et al., 2004; Moriel et al., 2012) but also the immune response of weaned calves.

**The Bottom Line**

In summary, offering a low-starch energy supplement daily instead of three times weekly to recently weaned beef steers consuming medium-quality forages reduced the daily variation in nutrient intake and enhanced the growth performance and antibody production against BVDV-1b. Therefore, these data indicate that producers should not reduce the frequency of energy supplementation to beef steers during the preconditioning period.

**References**


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