

# Effect of Pasture Trace Mineral Supplementation on Liver Mineral Levels and Postweaning Health

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The development of healthy, immune competent beef animals during the cow/calf phase of production can be important for successful transition of weaned calves to the feedlot. The objectives of this trial were to determine if differences are present in liver mineral levels, feedlot morbidity and mortality, weaning weights, and serological titers of calves nursing dams supplemented with and having access to one of three mineral supplements: sulfate-based trace minerals, metal-complexed trace minerals, and a control mineral. An additional objective was to determine if differences in liver mineral levels are present in cows fed one of the three minerals on a free choice basis.

The large herd of cow/calf pairs were randomly allotted to one of nine pastures in which one of the three mineral supplements were available free choice. Liver biopsies were performed on a statistical sampling of cows

in both spring and fall and a sample of calves in the fall at weaning. Consumption of minerals in forage, water, and mineral was monitored. Analysis of grass clippings at three intervals during the summer showed a range of 2.38-4.16 ppm copper. A total of 618 calves were weaned.

Results of liver biopsy analyses showed differences in values ( $p < .05$ ) in both cows and calves. Additionally, 56 day morbidity data showed a difference ( $p < .05$ ) in feedlot morbidity with metal-complex mineral calves showing improvement over sulfate-based mineral calves. There were no differences in viral serological titers. There were no differences in mortality during that period.

This trial demonstrated significant differences in liver mineral storage between groups as well as improved 56-day feedlot morbidity in metal-complex calves as compared to sulfate-based calves.

## Comparison of Maternal Blood and Fetal Liver Selenium Concentrations in California Cattle

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Selenium (Se) concentrations were measured in paired maternal blood and fetal liver samples from a California slaughterhouse (SH) (beef=19, dairy=54) and from bovine abortions submitted to the California Veterinary Diagnostic Laboratory System (CVDLS) (beef=20, dairy=20).

Significant breed and location differences were noted ( $P < 0.001$ ). Of the SH samples, dairy maternal blood selenium contents were higher (mean  $\pm$  sd;  $0.22 \pm 0.056$  ug/ml) than the beef breeds ( $0.137 \pm 0.082$ ). The CVDLS mean maternal blood content of the 9 dairy

breeds samples ( $0.192 \pm 0.028$ ) was similar to the SH dairy samples but greater than the SH beef samples. The SH mean fetal liver Se contents were also higher ( $P < 0.001$ ) for the dairy breeds ( $0.777 \pm 0.408$  ug/g) compared to beef ( $0.443 \pm 0.038$ ). Mean fetal liver Se content for SH samples were higher ( $P < 0.002$ ) than the CVDLS fetal liver samples (beef,  $0.244 \pm 0.149$ ; dairy,  $0.390 \pm 0.165$ ). The CVDLS dairy fetal liver content was greater ( $P < 0.001$ ) than those for beef breeds.

The average fetal liver to maternal blood Se content ratio was  $3.53 \pm 1.89$  for SH dairy breeds ( $r=0.38$ ),