Impact of Feeding Complexed Minerals on Postpartum Ovarian Activity in Dairy and Beef Cows

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Abstract

The effect of feeding complexed trace minerals to cows on postpartum resumption of ovarian activity was evaluated in nine trials. In these trials, cows fed complexed trace minerals had fewer days to postpartum ovarian activity as noted by fewer days to first estrus and luteal activity, reduced need for progesterone-secreting vaginal implants (CIDR) and increased percentage of cows bred by artificial insemination (AI) and exhibiting ovarian structures at 45 days postpartum.

Introduction

Zinc, manganese, copper and cobalt play vital roles in reproduction, including postpartum uterine repair, immune function and synthesis of cholesterol, a precursor for progesterone and estrogen. Trace mineral imbalances and antagonists impede attainment of adequate trace mineral status. Feeding complexed trace minerals increases the probability that cows will absorb adequate amounts of trace minerals. Our objective was to review the effect of feeding complexed trace minerals to cattle on postpartum resumption of ovarian function.

Materials and Methods

Trials were conducted at Miner Institute, Riverside Veterinary Clinic in New Zealand and the universities of Montana State (2), Colorado State, North Carolina State and Tennessee (3). Beef cattle were utilized in four studies and dairy cattle were utilized in five studies.

Results and Conclusions

North Carolina researchers found that replacing zinc and manganese oxide with complexes increased the percentage of beef cows bred during the 45 days AI period (65.7 vs. 56.8%). Similarly, Montana researchers found a greater percentage (P=0.06) of beef cows fed complexed zinc, manganese, copper and cobalt bred AI (61.1%) than cows fed only sulfate trace minerals (33.3%). In a Colorado State study, a greater percentage (P<0.05) of cows fed complexed trace minerals were bred AI (75%) than cows fed either low (61%) or high sulfate (56%) diets.

Additional Montana data indicated supplementing complexed trace minerals increased percentage (P=0.09) of beef cows having significant ovarian structures at 45 days postpartum and reduced days (P=0.05) to first breeding as compared to control and sulfate treatments.

Tennessee results indicated that dairy cows fed complexed zinc the last six weeks of gestation had fewer days to first estrus (P<0.01) and first service (P<0.10). A second Tennessee study found that if cows retained their placenta, then supplementing the diet with complexed zinc, manganese, copper and cobalt the last three weeks of gestation reduced days to first luteal activity and first estrus. In New Zealand, a greater percentage of cows fed complexed zinc, manganese, copper and cobalt had significant ovarian structures two weeks prior to mating as noted by reduced (P<0.01) CIDR usage (16 vs. 26%). A third Tennessee study indicated that cows fed complexed zinc, manganese, copper and cobalt postcalving had fewer days to first luteal activity (28.8 vs. 35.0; P<0.15) and first estrus (67.6 vs. 46.9; P<0.05). This response was magnified in cows that retained their placenta.

Miner research found that replacing inorganic zinc, manganese, copper and cobalt with complexed sources reduced days open (86 vs. 148; P<0.05) in cows with a four-week voluntary waiting period.

Results of these nine studies indicate that feeding cows complexed trace minerals reduces days to postpartum ovarian activity.