

2001/V09



Producer Research Support

Effect of Trace Elements on Weaner Calf Performance

Stratford BeefCheque



The Stratford BeefCheque producer group ran a trial to determine whether there is any economic benefit in treating calves with injections of copper, selenium and cobalt, according to calf growth rates.

There was no significant treatment effect on calf growth rate overall. Most group members and participants did not treat their calves annually with trace elements prior to the trial. They have indicated that they intend to blood test to determine if supplementation is required in the future.

The project

Copper is a trace element that is required for the synthesis of vitamin B₁₂. Deficiency of this trace element can cause diarrhoea, anaemia and loss of body weight or poor growth rates in calves.

Selenium is a component of the enzyme Glutathione peroxidase, which is an antioxidant. Deficiency in selenium can reduce resistance to infectious disease and an unthriftiness syndrome which may reduce growth rates or cause body condition loss.

Cattle producers regularly treat their stock with trace elements to guard against these syndromes.

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Objectives

1. determine whether treatment of calves with the selenium, copper and cobalt injection at marking and weaning has an effect on growth rates;
 - a. ensure 10 project group members use the trace element injections on 50 percent of their herds;
 - b. monitor the treated and control groups; and
 - c. weigh animals every three months.
2. increase calf weaning weights using copper, cobalt and selenium injections for calves born in 2002; and
3. measure any production increases against the cost of application.

What was done

Beef calves from nine farms were weighed on either two or three occasions from the time of the first vaccination until weaning. Prior to their first weighing, 10 calves from each herd were selected at random for blood testing of copper, vitamin B₁₂ and Glutathione peroxidase levels. Herds were given a status of adequate, marginal or deficient in each of these levels based on the average of the 10 samples.

On each farm, the calves were randomly assigned into treatment and control groups in equal numbers at the time of the first weighing. Treated calves received a subcutaneous injection of copper, selenium and cobalt. Controls received no treatment.

The first weighing coincided with normal handling for routine vaccination and castration practices. According to manufacturer recommendations, the calves in the treatment groups were again treated 12 weeks after the initial treatment. Both control and treatment groups were reweighed at that time. A third weighing took place on some farms at the time of weaning.

Average daily weight gains were calculated for each animal. Results were analysed using analysis variance (ANOVA) in a general linear model including the variables of treatment, farm and, where recorded, sex.

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Producer Research Support

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November 2005 / PIRD OUTCOMES

What happened?

Eight of the nine herds had blood test results available. The 10 results from each herd were averaged and classified as adequate, marginal or deficient by the laboratory values for normal ranges in cattle.

One herd did not record calf identification for the control group and was therefore excluded from the analysis. Three of the remaining herds did not record sex. There were 748 calves remaining for analysis; 369 treated and 379 control.

Overall there was no statistically significant difference in growth rates in each treatment group.

Herds were stratified by trace element status and the treatment effect was analysed within trace element status subgroups. In a herd of 149 calves with marginal cobalt levels there was a statistically significant response to treatment. In this herd there was a 311 day difference between first and last weighing, which equated to a difference in live weight of 7.96kgs between treatment and control groups.

Discussion

There was no significant treatment effect on calf growth rate overall, however in the herd that showed marginal cobalt levels in stock there was a significant treatment effect. It is possible that the treatment effect was related to treatment of cobalt deficiency in this herd.

If each calf was sold for a \$1.75/kg live weight, this would equate to a difference of \$13.90 between treatment and control calves at the time the second weighing in this herd, which was 311 days after the first weighing. In remaining herds there was no economic benefit of treatment, even in those herds in which calves were blood tested with marginal or deficient levels of copper or selenium.

Those members who retained heifers as breeders from the trial calves have found no difference in weight gain or pregnancy rates between the control and the treated heifers.

Next Steps

Producer group members who participated in the trial found the exercise of weighing, measuring and monitoring calves to be extremely beneficial. Most members and participants did not treat their calves annually with trace elements prior to the trial. They have indicated that they intend to blood test to determine if supplementation is required in the future.

Two participants and another group member will still use some trace element supplementation in their calves (one copper, one cobalt and one selenium and cobalt) despite the trial showing no economic benefit. Some participants will monitor calves and blood test in years of high grass growth as veterinary advice suggests there are more likely to be deficiencies in these years. They would only use trace element supplements if deemed necessary.

The cost (including labour) of injecting copper, cobalt and selenium every three months came to about \$10 per calf, which can be saved if supplementation is not necessary.