

# The Effect of Multimin<sup>®</sup> 90 Injections on the Performance of Weanling Calves



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## Abstract

Weaning is usually a physiologically stressful period for both the cows and the calves, and it can result in significant weight loss for the weaned calves. The overarching purpose of this experiment is to identify the effects of Multimin<sup>®</sup> 90 injections on the performance of weanling calves. We hypothesize that giving two Multimin<sup>®</sup> 90 injections to weanling calves will decrease the negative impact of weaning stress on the calves. Multimin<sup>®</sup> 90 contains the trace minerals zinc, manganese, selenium, and copper. These minerals are essential for boosting the immune system and thus improving animal health particularly during stressful periods such as weaning. To determine the effect of the Multimin<sup>®</sup> 90 injections on calf performance, seven (7) calves were divided into two groups: 1) No Multimin<sup>®</sup> 90 Group (4 calves; **Control Group**), 2) Multimin<sup>®</sup> 90 Group (3 calves; **Experimental Group**). Physical measurements such as body weight and hip height were taken at three time points (start, middle, and end of study). Variables of interest include the average daily gain (ADG) and change in hip height over the experimental period that was designed to last for 56 days. Although the most significant changes to calf weight were expected during the four-week period following weaning i.e., after the second Multimin<sup>®</sup> 90 injection, the small number of calves in the study did not detect the expected effect.

## Materials and Methods

- 7 weanling calves were randomly assigned to 1 of 2 treatments: **MMI<sup>b</sup>** (group receiving Multimin<sup>®</sup> 90 injections) and **CON<sup>a</sup>** (group not receiving Multimin<sup>®</sup> 90 injections).
- Variables measured: Average Daily Gain (ADG) and hip height
- Both groups were kept on feedlot and were given oat hay supplemented by a trace mineral salt block throughout the entire duration of the study.
- The study was conducted over a period of 56 days (8 weeks), with measurements of ADG and hip height taken in 3 separate sessions (at the start, midway, and end).
- Multimin<sup>®</sup> 90 injections were administered at the start (day 0) and midway (day 28) of the study.

### Statistical Analysis

Descriptive analyses (mean, SE, and 95% CI) were conducted for body weight, ADG, and hip height. Multilevel mixed-effects linear regression models were used to determine the association between body weight and treatments. Calf number was included in the model as a random factor, while treatment, week and interactions between treatment and week was included as fixed factor. Two-sample test was used to compare the ADG between treatment. All analyses were conducted using Stata software version 18.



## Introduction

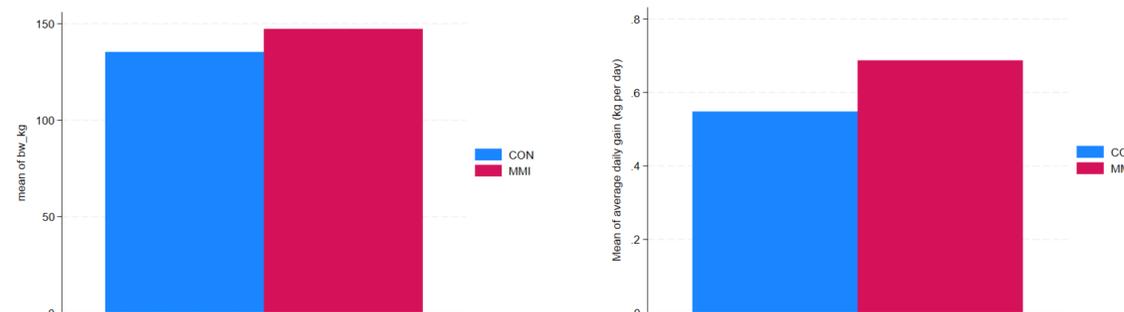
- The United States is the world's largest beef producer, primarily focusing on grain-fed cattle for domestic and export usage.
- In 2024, **26.985 billion pounds** of beef were produced domestically. Due to expected heavier carcass weights and a strong national demand, the beef cattle industry is projected to produce **25.790 billion pounds** of beef in 2025.
- While salt blocks in feedlots are the primary source of trace minerals for beef cattle, injectable trace minerals are an alternative method of supplementation.
- Injectable trace minerals (ITM) remove variability concerning voluntary mineral intake from salt blocks.
- ITM sources containing copper, manganese, and zinc have been empirically shown to improve feed efficiency in beef cattle, but impacts on calf performance have been variable.
- The aim of this research is to develop a cost-effective way to improve weanling beef cattle performance and mitigate the negative physiological impacts of weaning.
- By using a Multimin<sup>®</sup> 90 injection containing zinc, manganese, selenium, and copper, we aim to boost beef calf immune health and weight gain during weaning.
- Given standard feedlot conditions, we hypothesize that weanling calves given two rounds of Multimin<sup>®</sup> 90 injections will have improved performance.

## Results

### Effect of Multimin<sup>®</sup> Injections on the Performance of Weanling Calves

	CON <sup>a</sup>	MMI <sup>b</sup>	P value
BW <sup>c</sup> at start (day 0), kg	114.77±4.69	128.18±5.42	0.061
BW midway (day 28), kg	137.95±4.69	147.42±5.42	0.186
BW at end (day 56), kg	153.30±4.69	166.06±5.42	0.075
ADG <sup>d</sup> , kg	0.55±0.09	0.69±0.04	0.281
Hip height at start (day 0), cm	91.44±1.59	94.83±1.84	0.164
Hip height midway (day 28), cm	100.01±1.59	100.75±1.84	0.761

CON = control (group not receiving Multimin<sup>®</sup>); MMI = Multimin<sup>®</sup> Injections (group receiving Multimin<sup>®</sup> injections); BW = bodyweight; ADG average daily gain



- Concerning the primary variable of interest, Average Daily Gain (ADG) in kilograms, the Multimin<sup>®</sup> 90 injections did not demonstrate a significant phenotypic effect ( $p > 0.05$ ).
- There were no significant differences between the controlled and experimental groups for calf hip height ( $p > 0.05$ ).

## Conclusion and Implications

- Even though the study failed to reject the null hypothesis, the outcome can be explained by a small sample size of calves in the study.
- Because a limited number of animals were available for the research, this limitation significantly reduced the power of the test ( $1 - \beta$ ). Thus, the test's ability to accurately detect the effect of the Multimin<sup>®</sup> 90 injections when those effects are present is low.
- However, this study can serve as the groundwork for future research into the effect of Multimin<sup>®</sup> 90 injections on weanling calves.
- Given a much larger sample size and repeated tests, the effect of the injections may be better observed.
- In addition, more time spent observing changes in ADG after the completion of the injection series may uncover more data on the long-lasting effects of the Multimin<sup>®</sup> 90 injections.

## Literature Cited

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## Objectives

- Determine the effect of Multimin<sup>®</sup> 90 injections on the performance of weanling calves
- Research the effect of supplemental minerals on animal performance given standard feedlot conditions

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