THE EFFECT OF FOURPLEX® ON GAIN AND HEALTH OF NEWLY ARRIVED CALVES [1]

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Summary

Two trials were conducted to evaluate the effects of Fourplex®, a trace mineral supplement, on long-hauled stocker calves. In each trial, Fourplex was added to the ration of lightweight, long-hauled calves in four pens, while calves in another four pens served as controls. Additionally, every other calf that became sick, regardless of feed treatment, was drenched with a solution of Fourplex in Trial I and a Cu, Zn, Mn+Co solution in Trial II. Fourplex in the feed did not improve ADG, reduce morbidity, or reduce the number of treatments required per sick animal. In Trial II, Fourplex-fed calves that became sick required more treatments ($P<.12$) during the first 2 weeks; however, during the third and fourth weeks, they required fewer treatments ($P<.03$). In Trial I, sick calves drenched with Fourplex required more treatments. In Trial II, drenching with a Cu, Zn, Mn+Co solution resulted in an increase in treatments per sick calf during the fourth week. In these trials, Fourplex did not significantly increase performance or reduce sickness.

(Key Words: Fourplex®, Copper, Zinc, Trace Minerals.)

Introduction

Copper (Cu) and zinc (Zn) have been shown to be important for certain enzymes in the immune system. The objective of this study was to determine if Fourplex, a trace mineral premix containing Cu and Zn, would improve the health and gain of highly stressed calves when included in the diet or in a drench given when the calves first exhibited signs of sickness.

Experimental Procedures

Trial I. One hundred and fifty-nine bull calves shipped from Georgia were allotted randomly to treatments: 1) control or 2) Fourplex fed at 15 g/head/day, which provides three times the NRC minimum daily requirement for Cu, Zn, Mn, and Co. There were four pens per treatment. The calves were vaccinated at arrival with modified-live IBR+BVD+PI_3, 7-way blackleg, and Presponse®. They were individually weighed at processing and on day 28. Additionally, they were dewormed with levamisole, deloused with Lysoff®, implanted with Ralgro®, mass medicated with Micotil®, and castrated via banding. Every other calf pulled for sickness from each pen, regardless of treatment, was drenched with 100 ml of Fourplex C. This drench was made by adding 21 g of Fourplex C to 100 ml of water and straining through cheesecloth. The material was difficult to move through the drench guns and had to be diluted slightly in the straining process. A sick pen was provided for each treatment group; therefore, the calves remained on the original feed treatments while in the sick pen. Similar antibiotic treatment strategies were used on sick

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calves regardless of feed or drench treatments.

Trial II. One hundred and sixty-eight calves were allotted randomly to the same feed treatments as in trial I with four pens per treatment. Processing treatments and handling procedures were also the same. However, in this trial, every other sick calf from each pen was drenched with 100 ml of a solution made with 5.4 g of Zinpro® 200, 3.75 g Cuplex® 100, 3.75 g Manpro® 160, 0.94 g Copro® PD, and 100 ml of water.

Rumen fluid was collected from two calves per pen on days 1, 14, and 28. In addition, rumen fluid was collected from the first two calves that became sick from each pen. Rumen fluid was collected again when they left the sick pen. The rumen fluid was frozen and later analyzed for Cu, Zn, Mn, and Co.

Results

In Trial I, no differences occurred in ADG, percent morbidity, number of treatments per animal, or feed intake between control and Fourplex-fed calves (Table 1). Drenching sick calves with Fourplex increased (P<.05) the treatments required (10.4 vs 5.3 for nondrenched calves).

Table 1. The Effect of Fourplex® in the Starter Diet for Long-Hauled Calves, Trial I

Item	Fourplex	Control
No.	80	79
Starting wt, lb	260	252
ADG, lb	1.41	1.50
Morbidity, %	40.5	29.9
Treatments/animal	6.9	6.5

In Trial II, Fourplex in the feed did not improve ADG, reduce mortality or morbidity, or influence feed intake (Table 2). The number of treatments required for sick animals was higher (P<.12) for those receiving Fourplex in the diet for the first 2 weeks. However, by the fourth week, the Fourplex-fed calves required fewer treatments than the controls. This might suggest that Fourplex in the feed adds stress to the calves before the additional mineral supplementation has a chance to improve the immune system. However, by week 4, the immune system may have had a chance to respond, resulting in fewer treatments per animal. The feeding of Fourplex resulted in increased (P<.05) rumen concentration of all minerals except Zn on days 14 and 28. Zinc was elevated in the rumen only at day 14. Feed intake was not affected by Fourplex.

Table 2. The Effect of Fourplex® in the Feed on Gain and Health of Calves, Trial II

Item	Fourplex	Control
No.	84	84
Starting wt, lb	246	255
ADG, lb	1.15	1.08
Mortality, %	5.8	3.5
Morbidity, %	72.0	63.4
Treatments/animal		
Week 1	4.6[a]	4.1[b]
Week 2	3.9[a]	3.1[b]
Week 3	5.3	4.9
Week 4	4.1[c]	6.2[d]

[a,b]Means in the same row with unlike superscripts are different (P<.12).

Drenching tended to increase the number of treatments required in both feed groups. In the fourth week, the difference became significant (P<.08); (6.0 vs 4.2 treatments per head). This suggests that drenching sick calves with high doses of trace minerals on the first day in the sick pen did not improve the response to antibiotic therapy. More research data are needed to understand better the dosage level and effect of the drench on the health of light-weight calves.