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J.O. Wallace

Christopher D. Reinhardt

Daniel U. Thomson

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Concurrent Metaphylaxis with Aureomycin and Draxxin in High-Risk Calves Has No Additive Effects on Cattle Health and Performance

J. O. Wallace, C. D. Reinhardt, and D. U. Thomson

Introduction

The shipping and receiving period is one of the most stressful experiences during a calf's lifetime. Stressors include weaning, commingling, transportation, processing, feed and water changes, and disease challenge placed on the animal upon entering a stocker operation or feedlot. These stressors result in decreased appetite, loss of body mass, decreased immunity, and increased risk of disease. Bovine respiratory disease complex has one of the highest treatment costs of all diseases affecting feedlot cattle and can negatively affect feedlot performance and carcass characteristics of animals, resulting in decreased profit.

Mass medication (metaphylaxis) is the treatment of all cattle at arrival processing despite observed health status by using either injectable or feed-grade antibiotics. However, no research has examined effects of concurrent metaphylaxis with both Draxxin (Pfizer Animal Health; New York, NY) and chlortetracycline simultaneously. Therefore, the objective of this study was to examine effects of concurrent metaphylaxis with Draxxin and chlortetracycline upon arrival on high-risk stocker calf health and performance.

Experimental Procedures

Two 41-day receiving studies were conducted at the Kansas State University Beef Stocker Unit during November 2007 and March 2008 to determine the response of high-risk stocker calves to concurrent metaphylaxis with Draxxin and Aureomycin (Alpharma Inc., Ridgefield Park, NJ). All cattle were sourced from an order buyer in Tennessee, and cattle were received over three consecutive days. Upon arrival, all calves were weighed, tagged, mass medicated with Draxxin (1.1 mL/100 lb), and palpated for sex (bull or steer). Calves were then given ad libitum access to long-stem prairie hay and water overnight. The following day, calves were vaccinated against clostridial and respiratory diseases and dewormed, and bulls were surgically castrated. Calves that arrived in March were also poured for lice. Each load was then blocked by arrival date and randomly assigned to one of three treatments for a total of 18 pens. Castrated bulls were equally distributed among the six pens within each alley. Cattle were weighed and revaccinated 12 days following initial processing and weighed again following the 41-day feeding period. Calves were stepped up by using three sequential growing diets ranging from 29 to 36.5% concentrate. Diets were fed with addition of the following treatments: no top-dress pellets (CON), top-dressed with Aureomycin-containing pellets [CTC; 10 mg CTC/pound of body weight (BW)], or top-dressed with the same pellets that did not contain any Aureomycin (PP). The PP pellets were top-dressed at an amount per unit BW equal to that of the CTC pellets. The CTC and PP treatments were top-dressed for two periods that each lasted 5 days (days 1 to 5 and days 7 to 11).

Cattle were observed daily for signs of illness and injury by personnel blinded to treatments. Calves were treated for respiratory disease with Draxxin only following a moratorium of 5 days post-metaphylaxis. Calves that were determined to need treatment were given Baytril (5 mL/100 lb or 5 mL/45.35 kg) as a first treatment; Nuflor (6 mL/100 lb or 6 mL/45.35 kg;) as a second treatment, if needed; and Bio-Mycin 200 (4.5 mL/100 lb or 4.5 mL/45.35 kg) as a third treatment, if needed.

Bunks were checked approximately twice daily, and feed was delivered in amounts sufficient to result in slick bunks both morning and afternoon. Calves were fed their respective diets at approximately 7:00 a.m. and 3:00 p.m. daily for 41 days.

Daily dry-matter intake, gains, and feed efficiencies were determined for each pen of calves. Health records were used to determine the number of animals treated and percentage death loss.

Performance and health data were analyzed by using the random effects MIXED model procedure of SAS. Treatment was included in the model as a fixed effect, and study and start date were included as random variables. Values were determined to be statistically different when $P \leq 0.10$.

Results and Discussion

Initial BW was different among the three treatments as a result of animals within each load being blocked by alley and randomized to pens by BW and sex (bull vs. steer). Final BW was also different among the three treatments (Table 1); however, it was reflective of initial weights with PP calves having the heaviest final BW, CTC calves having the lowest final BW, and CON calves being intermediate. Daily DMI was affected by treatment ($P=0.09$) and followed the same pattern as initial and final BW (PP calves consumed the most feed, and CTC calves consumed the least). Average daily gain and feed efficiency were not affected by treatment ($P>0.39$).

The percentage of total animals removed from pens because of illness and the percentage of retreatments were not affected by treatment ($P>0.20$). Additionally, there were no differences in death loss among the three treatments ($P=0.25$).

Lack of response to metaphylactic treatment could be a result of timing of administration of the two antibiotics. Effective concentrations of Draxxin have been observed for up to 8 days following subcutaneous administration in calves. It may have been more beneficial to administer the chlortetracycline to calves in this study following a moratorium of at least 8 days post-metaphylactic treatment with Draxxin.

Implications

This experiment showed no additive effects of metaphylaxis by using Draxxin concurrently with two 5-day periods in which Aureomycin was fed. These data may be beneficial to producers when designing treatment protocols for newly received high-risk stocker calves.

Table 1. Performance of calves receiving no pellets (CON), pellets containing chlortetracycline (CTC), or pellets without chlortetracycline (PP) during the 41-day receiving studies

Item	Treatment ^{1,2}			SEM	P-value
	CON	CTC	PP		
Head, no.	154	155	154		
Pens, no.	12	12	12		
Initial wt., lb	447 ^{ab}	442 ^a	452 ^b	5.72	0.07
Final wt., lb	576 ^{ab}	569 ^a	584 ^b	5.67	0.06
Daily DMI, lb	13.63 ^{ab}	13.46 ^a	14.13 ^b	0.29	0.09
ADG, lb	3.15	3.11	3.22	0.14	0.39
G:F, lb	0.229	0.233	0.230	0.01	0.50
Pulls	25.7	25.7	22.7	0.06	0.80
Respiratory pulls	24.4	25.1	22.0	0.06	0.80
2 nd Pulls	2.0	2.5	2.0	0.01	0.38
2 nd Respiratory pulls	4.6	5.5	4.4	0.01	0.64
Death loss	2.0	2.0	3.3	0.01	0.25

¹ CON = fed three growing diets only; CTC = three growing diets top-dressed with pellets containing chlortetracycline (4 g/lb CTC) to provide 10 mg CTC per pound BW; PP = three growing diets top-dressed with pellets containing no CTC administered at the same amount per unit of BW as those in the CTC treatment (1.12 lb/head).

² Pellets were top-dressed from days 1 to 5 and days 7 to 11.

^{ab} Within a row, numbers without a common superscript letter differ (P≤0.10).