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FEEDLOT PERFORMANCE, HEALTH, AND CARCASS CHARACTERISTICS OF BEEF HEIFERS TREATED WITH CYDECTIN® OR DECTOMAX® AT PROCESSING

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Summary

Two parasite-control products were compared in an experiment evaluating growth performance, health, and carcass characteristics. Crossbred heifers (n=1747; 837 lb average weight) were randomly assigned to receive either Cydectin® or Dectomax®. Both products were administered at processing at 1 ml per 22 lb of body weight. Cattle were randomly allotted to 12 paired pens by treatment based on source, truckload, and arrival date. Fecal egg counts taken at processing (9.74 eggs per gram) and at reimplanting (0 eggs per gram) indicated that both products were effective in eliminating adult female gastrointestinal parasites. No differences were detected in average daily gain, feed intake, feed efficiency, or most carcass characteristics. Respiratory pulls, realizer cattle, and death loss did not differ between treatments. In this experiment, similar growth performance, health, and carcass traits were observed for heifers treated with either macrocyclic lactone product.

Introduction

Internal and external parasites are a common problem in cattle. Economic losses to the U.S. cattle industry due to parasitism have been estimated to be more than a billion dollars annually. Internal parasites decrease performance by reducing feed intake, reducing available nutrients, and impairing nutrient utilization. Lice and mites also reduce cattle performance. Grubs cause losses due to hide and muscle tissue damage. Carcass and animal health can be improved with parasite control through better nutrient availability and utilization.

Several cattle products based on macrocylic lactones, a class of endectocides that control both internal and external parasites, have been marketed since 1984. The products are oral drenches, injectables, or pour-ons. Product differences also include the carrier and the active ingredient. Carriers have been either alcohol or oil based. The active ingredients come from one of two chemical families; milbemycins or avermectins. Moxydectin, the active ingredient in Cydectin®, is a milbemycin, whereas doramectin, the active ingredient in Dectomax®, is an avermectin. There are some differences between efficacy and persistence (post-treatment control) of the two products. Although there are differences in label claims with regard to species controlled, a number of the species such as Cooperia and Thelazia spp. are not economically import, particularly in specific locales. The five most economically important internal parasites in cattle are Dictyocaulus, Haemonchus, Nematodirus, Ostertagia, and Trichostrongyles. Table 1 lists the similarities and differences between Cydectin® and Dectomax® for internal and external parasite control. Numerous studies have attributed im-

[1]Formerly with Fort Dodge Animal Health.
[2]Fort Dodge Animal Health.

proved feedyard performance to internal and external parasite control with the use of the macrocyclic lactones. This experiment was conducted to evaluate feedlot performance and carcass traits of heifers treated with either Cydectin® or Dectomax® for internal parasite control. The presence and control of grubs, lice, mites, and horn flies was not evaluated in this study.

Procedures

Yearling crossbred heifers (n=1747) averaging 837 lbs originated from three ranches in South Dakota and Wyoming. Approximately 24 hours after arrival at a southwestern Kansas feedyard, the heifers were processed, and each animal received a four-way modified live viral vaccine, a clostridial vaccine, an implant containing 20 mg estradiol benzoate and 200 mg testosterone, and a uniquely numbered eartag. One of each pair of heifers was assigned to either Cydectin® or Dectomax® according to a predetermined randomization schedule. The cattle were treated topically along the back with 1 ml of one product per 22 lbs of body weight (0.5 mg active ingredient / 2.2 lb). The cattle were blocked by origin, truckload, and arrival date and were randomly allotted to neighboring pens by treatment. Six pens per treatment were used, with 134 to 196 heifers in each pen. Numbers of heifers in paired pens differed by no more than one animal. The heifers were placed on feed October 10, 2001. The cattle were fed the same steam-flaked rations, and adjusted to the finishing ration two to three weeks after arrival. Feed and water were offered for ad libitum consumption. Approximately 80 days before harvest, the heifers were revaccinated with a modified live IBR/BVD vaccine and reimplanted with a 200-mg trenbolone acetate implant. Each pair of pens was harvested on the same day at a commercial abattoir in southwestern Kansas. Days on feed ranged from 128 to 139, with an average of 133 days. Carcass data were collected after a 26- to 28-hour chill.

Fecal samples were collected at processing from one randomly predetermined animal of every 10 animals in each treatment. The samples were again collected from the same heifers at reimplanting. The number of eggs per gram of feces was determined at a commercial laboratory by using the modified Wisconsin method, a commonly used and accurate method for counting internal parasite eggs.

Individual weights measured at processing were summed by pen for use as initial weights. Pen weights measured before shipment for harvest were used as final weights after a 4% pencil shrink. Feed delivery from the feedyard closeout summary was used as feed intake. Average daily gain, feed intake, and feed efficiency were calculated with deads in.

Results and Discussion

Individual fecal samples collected at processing ranged from 0 to 124 eggs per gram with an average of 9.74 eggs per gram. Both Cydectin® and Dectomax® eliminated gastrointestinal parasites, as indicated by fecal evaluation at reimplanting (0 eggs per gram).

Animal performance and carcass traits are listed in Table 2. Initial body weights were similar between the two treatments, as were average daily gain, feed intake, and feed efficiency. No differences were detected for respiratory pulls, realizer animals, and death loss. Final weight, hot carcass weight, and dressing percentage were similar. No differences were observed for the quality traits of marbling score, carcass maturity, and dark cutting. The percentage of USDA Prime carcasses tended to be higher (P=0.10; 3.71 vs. 2.13%) and kidney, pelvic, and heart fat was slightly greater (P=0.06; 2.34 vs. 2.26%) in carcasses from Cydectin®-treated heifers. Backfat, ribeye area, and USDA Yield Grades were not different.

Although this study did not have an untreated control group, other research has shown the benefit of treating feedlot cattle for parasites. Research has consistently shown improved gain, feed efficiency, health, and carcass traits with the use of broad-spectrum endectocides. These benefits are the result of greater feed intake, more available nutrients, and better nutrient utilization. The incidence of grubs and mites has decreased with the use of the macrocyclic lactones. Lice continue to be a common cattle problem, and also can affect performance if not controlled. Cydectin® and Dectomax® supported similar feedlot performance and animal health.

Table 1. Active Ingredient, Concentration, Dosage, and Parasite Control Comparison of Cydectin® and Dectomax®

Item	Cydectin®	Dectomax®
Active ingredient	Moxydectin - Milbemycin family	Doramectin - Avermectin family
Concentration	5 mg / ml	5 mg / ml
Dosage	0.5 mg active ingredient / 2.2 lb 1 ml product / 22 lb	0.5 mg active ingredient / 2.2 lb 1 ml product / 22 lb
Carrier	Oil	Alcohol
Gastrointestinal roundworms	*Ostertagia ostertagi* (adult and L_4, including inhibited larvae)[4] *Haemonchus placei* (adult and L_4)[2] *Trichostrongylus axei* (adult and L_4) *Trichostrongylus colubriformis* (adult and L_4) *Cooperia oncophora* (adult and L_4) *Cooperia pectinata* (adult) *Cooperia punctata* (adult and L_4) *Cooperia spatulata* (adult) *Cooperia surnabada* (adult and L_4) *Bunostomum phlebotomum* (adult) *Nematodirus helvetianus* (adult and L_4) *Oesophagostomum radiatum* (adult and L_4)[4]	*Ostertagia ostertagi* (adult and L_4, including inhibited larvae)[4] *Ostertagia lyrata* (adults) *Haemonchus placei* (adult and L_4)[5] *Trichostrongylus axei* (adult and L_4) *Trichostrongylus colubriformis* (adult and L_4) *Cooperia oncophora* (adult and L_4)[3] *Cooperia pectinata* (adult) *Cooperia punctata* (adult and L_4)[4] *Cooperia surnabada* (adult) *Bunostomum phlebotomum* (adult) *Oesophagostomum radiatum* (adult and L_4)[4] *Trichuris* spp. (adults)
Lungworms	*Dictyocaulus viviparus* (adult and L_4)[6]	*Dictyocaulus viviparus* (adult and L_4)[3]
Eyeworms		*Thelazia gulosa* (adults) *Thelazia skrjabini* (adults)
Cattle grubs	*Hypoderma bovis* *Hypoderma lineatum*	
Mites	*Chorioptes bovis* *Psoroptes ovis* (*Psoroptes cummunis* var. *bovis)*	
Lice	*Linognathus vituli* *Haematopinus eurysternus* *Solenopotes capillatus* *Bovicola (Damalina) bovis*	*Linognathus vituli* *Haematopinus eurysternus* *Solenopotes capillatus* *Bovicola (Damalina) bovis*
Horn flies	*Haematobia irritans*[1]	*Haematobia irritans*[1]

[1]7 days, [2] 14 days, [3] 21 days, [4] 28 days, [5] 35 days, or [6] 42 days post-treatment control (persistency).

Table 2. Performance, Health, and Carcass Characteristics of Yearling Heifers Treated with Cydectin® or Dectomax®

Item	Cydectin®	Dectomax®	SEM	P-value
Number of pens	6	6	-	-
Number of heifers	873	874	-	-
Initial weight, lb	837	838	13.3	0.88
Final weight, lb	1278	1281	14.5	0.37
Daily gain, lb	3.32	3.34	0.02	0.41
Intake, as fed lb/day	30.1	30.0	0.38	0.76
Feed:gain, as-fed	9.06	8.96	0.07	0.31
Respiratory pulls, %	1.49	1.50	0.30	0.99
Realizers, %	0.12	0.12	0.08	0.99
Death loss, %	0.57	0.46	0.18	0.37
Hot carcass weight, lb	806	808	10.2	0.41
Dressing percentage	63.11	63.08	0.12	0.82
Backfat, inches	0.59	0.59	0.02	0.74
Ribeye area, square inches	14.56	14.74	0.16	0.47
Kidney, pelvic, heart fat, %	2.34	2.26	0.04	0.06
USDA Yield Grade				
Average	2.84	2.78	0.08	0.48
1, %	16.0	18.7	2.36	0.34
2, %	43.8	42.1	2.04	0.28
3, %	29.3	30.7	2.40	0.64
4, %	10.1	7.4	1.60	0.24
5, %	0.8	1.1	0.41	0.34
Marbling score	Sm^{76}	Sm^{74}	5.29	0.72
B and C maturity, %	2.1	3.2	0.51	0.29
Dark cutters, %	0.12	0.24	0.10	0.58
USDA quality grade				
Prime, %	3.7	2.1	0.67	0.10
Choice, %	69.4	69.9	1.03	0.87
Select, %	25.3	25.8	1.39	0.90
Standard, %	1.1	1.4	0.31	0.53
No roll, %	0.3	0.7	0.23	0.54