Louisiana State University
Agricultural Center

A Comparison of the Persistent Anthelmintic Efficacy of the Pour-on Formulations of Moxidectin, Doramectin, Ivermectin and Eprinomectin When Administered As a Single Treatment to Stocker Calves

A. F. Loyacano, J. C. Williams, J. A. Gurie, A. DeRosa, B. C. Clymer and F. Guerino
Dean Lee Research Station, Department of Veterinary Science, and Fort Dodge Animal Health

Findings

- Treatment with Cydectin, Dectomax and Eprinex pour-on formulations reduced the shedding of roundworm eggs by stocker calves for 28 days.
- Cydectin and Eprinex were more effective than Dectomax and reduced egg counts for 42 days.
- At Days 84 and 112, steers treated with Cydectin, Dectomax and Eprinex were heavier than untreated calves, and Cydectin calves were heavier than those treated with Ivomec.

Introduction

This trial was conducted at the Dean Lee Research Station to evaluate and compare the effectiveness of the pour-on formulations of moxidectin (Cydectin, Fort Dodge), doramectin (Dectomax, Pfizer, Inc.), ivermectin (Ivomec, Merial) and eprinomectin (Eprinex, Merial). The injectable and pour-on formulations of Ivomec and Dectomax had previously been evaluated at this station. The injectable formulations for both were effective, but the pour-on formulation of Ivomec was inconsistent in effect. The pour-on formulations of Eprinex and Dectomax were released in 1997, and Cydectin became available in January 1998. Eprinex is available only in the pour-on formulation and has no meat or milk withdrawal period. Cydectin has no meat withdrawal period. This trial was the first comparison of these four products.

Experimental Approach

Seventy-five crossbred steers that had positive nematode egg counts were allotted by weight to 15 groups of five calves. These groups of five were allotted by ascending weight to 15 paddocks. Paddocks were bermudagrass sod overseeded with ryegrass. Within paddock groups, one calf was randomly allotted to each of five treatments: treatment 1, untreated control; treatment 2, Dectomax pour-on; treatment 3, Ivomec pour-on; treatment 4, Eprinex pour-on; treatment 5, Cydectin pour-on.

Treatments were administered on Day 0 (1/18/98) of the trial, and calves were put in their appropriate paddocks. Wholesale product cost was approximately $2.50 per head. The product cost to producers would vary because of rebates. Calves were weighed on Days 0, 28, 56, 84 and 112. Individual rectal fecal samples were collected for fecal egg counts at seven-day intervals through Day 56 and on subsequent weigh days. Nematode parasite eggs were recovered from individual 3-gram samples

with a centrifuge-flotation procedure and counted. Results are expressed as geometric mean eggs per gram. Calves were weighed off test on Day 112 and were sold in a video sale shortly thereafter for $71.35 per hundred weight.

Results and Discussion

Level of egg shedding is influenced by several factors, including stress and diet characteristics. On Day 0, when calves had been processed through the working pens on two consecutive days and had been consuming only grass hay, egg counts were elevated. By Day 7, when the calves had been consuming high quality forage for a week and were not stressed, counts were reduced even for the control animals. Reductions in fecal egg counts for a given collection date were calculated by subtracting the treatment means from the control mean for that day, dividing the remainder by the control mean and multiplying by 100. Cydectin, Eprinex and Dectomax all reduced ($P<.05$) fecal egg counts by Day 7 post treatment, with Cydectin and Eprinex being more effective than Dectomax (Table 1). All three treatments resulted in a reduction in fecal egg counts of more than 94 percent. Average fecal egg counts for Dectomax treated calves were lower ($P<.05$) than controls through Day 28 of the study, but they were in most cases higher ($P<.05$) than those of Cydectin and Eprinex treated calves who had lower ($P<.05$) egg counts than controls through Day 42. Calves treated with Ivomec had egg counts that were lower ($P<.05$) than those of controls only on Days 7, 21 and 42. Cydectin and Eprinex treatments reduced egg counts by more than 95 percent through Day 28. By Day 49, differences in egg counts between groups were no longer different ($P<.05$) and are not reported in the table

By 28 days post treatment, all treated groups were heavier on average ($P<.05$) than the control group and were not different from one another (Table 2). On Days 56, 84 and 112, calves treated with Cydectin were heavier ($P<.05$) than control and Ivomec treated calves. Calves from the other two treatment groups were heavier ($P<.05$) than control calves but not Ivomec treated calves. Treatment with Cydectin, Eprinex and Dectomax resulted in increased calf gains and calf value by the end of the trial. Respective total gains for calves treated with Cydectin, Eprinex, Dectomax, Ivomec and no treatment were 338.1, 326.8, 232.2, 307.4 and 280.9 pounds. Dectomax, Eprinex and Cydectin treatments yielded higher calf values ($P<.05$) than Ivomec or control calves.

Data from this trial indicate that all of the pour-on formulations were effective in reducing nematode worm populations in treated calves. Ivomec was less effective than the other products. Eprinex and Cydectin had a longer period of efficacy than Dectomax. Steers treated with Dectomax, Eprinex and Cydectin were heavier than control calves at the end of the trial. These three treatments resulted in an appreciable increase in calf value and return over treatment cost. The pour-on formulations of Dectomax, Cydectin and Eprinex would all provide highly efficacious and cost effective treatments for the prevention and control of nematode parasites of stocker calves or replacement heifers.

Table 1. Egg count and percent reduction data (geometric means)

	Day of Study							
Treatment	0	7	14	21	28	35	42	49
Control	130.1[a]	33.0[a]	24.8[a]	27.0[a]	13.6[a]	14.4[a]	20.4[a]	23.9[a]
Dectomax	141.5[a]	1.9[c]	3.4[b]	3.4[bc]	3.3[bc]	4.4[ab]	7.2[ab]	16.0[a]
% reduction		94.2	86.1	87.3	75.6	69.7	64.6	33.0
Ivomec	98.4[a]	9.6[b]	14.0[a]	6.7[b]	7.7[ab]	8.3[ab]	5.7[b]	12.3[a]
% reduction		71.0	43.7	75.0	43.6	42.5	72.1	48.4
Eprinex	71.4[a]	0.1[d]	0.3[c]	0.6[cd]	0.6[c]	2.1[b]	0.9[c]	8.2[a]
% reduction		99.8	98.9	97.7	95.6	85.2	95.7	65.5
Cydectin	122.9[a]	0.2[cd]	0.8[bc]	0.4[d]	0.5[c]	2.7[b]	2.4[bc]	9.5[a]
% reduction		99.5	96.9	98.6	96.6	81.3	88.0	60.3

[abcd] Means within a column with a common superscript are not different (P<.05).

Table 2. Calf weight (lbs) and value data

	Day of Study							
Treatment	0	28	56	84	112	Total Gain	Value @ $.7135	Value-Control
Control	480.9[a]	557.2[a]	638.0[a]	718.7[a]	761.8[a]	280.9[a]	$543.52[a]	$0.00
Dectomax	483.5[a]	586.7[b]	682.5[bc]	763.5[bc]	806.7[bc]	323.2[bc]	$575.56[bc]	$32.04
Ivomec	480.7[a]	582.4[b]	667.9[b]	744.0[ab]	788.1[ab]	307.4[ab]	$562.29[ab]	$18.77
Eprinex	485.1[a]	586.1[b]	684.7[bc]	765.2[bc]	812.0[bc]	326.9[bc]	$579.34[bc]	$35.82
Cydectin	484.7[a]	592.5[b]	695.9[c]	778.1[c]	823.0[c]	338.3[c]	$587.19[c]	$43.67

[abc] Means within a column with a common superscript are not different (P<.05).