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Introduction

Severe parasite infections in beef cattle are sometimes associated with decreased growth and performance and clinical disease. Stocker cattle are exposed to many parasites and appropriate deworming strategies can help to minimize parasite burdens when cattle are on grass. Feedlot cattle are often dewormed at arrival and have minimal exposure to additional parasites once placed in the feedlot. The purpose of this study was to evaluate stocker and feedlot performance and carcass characteristics relative to treatment with deworming agents of varying durations of activity.

Materials and Methods

Sixty purebred, fall-born Angus heifers were given access to spring pasture for 35 days prior to the initiation of the trial to allow for inoculation with internal parasites. On June 17, heifers [610 ± 50 lb initial body weight (BW); 4.90 ± 0.34 initial body condition score (BCS)] were blocked by BCS, stratified by BW within BCS, and allotted to 1 of 2 injectable deworming treatments: 1) a control, conventional deworming agent, Ivomec® (IVO), or 2) a long-lasting deworming agent, LongRange® (LR). Concurrent fecal samples were collected to determine fecal egg count. Heifers were placed back on the same pasture to serve as a stocker phase until the pasture was no longer suitable for grazing (total of 63 days). Interim BW was taken at 27 days after treatment initiation. Fecal samples, BW and BCS, were taken at the end of the stocker phase. At the conclusion of the stocker phase, heifers were transported to a feedlot where they remained commingled and fed a finishing ration for 150 days. On arrival, heifers were stratified by BW within stocker phase treatment and allotted to either receive a standard injectable deworming treatment during processing (Ivomec®; DWRM) or no deworming treatment at all (NO). Fecal samples were collected four days prior to transport for slaughter for a final egg count analysis. Weights were collected 3 and 4 days prior to transport for slaughter and averaged for a final BW. For analysis of dressing percent, a 4 percent shrink was applied to the average final BW. Carcass data were collected by the Tri-County Steer Carcass Futurity. Binary and continuous data were analyzed using the GLIMMIX and MIXED procedures of SAS, respectively.

Results and Discussion

During the stocker phase, as designed, starting BW and BCS did not differ between treatments ($P \geq 0.67$, Table 1). Although final BW was not different between IVO and LR treatments ($P=0.38$), a greater change in BW ($P=0.01$) and increased average daily gain (ADG, $P=0.01$) was noted in LR treated heifers. However, final BCS and change in BCS did not differ ($P \geq 0.80$). The difference in BW gain and ADG during the stocker phase is likely due to an increase internal parasite load during the stocker phase by the cattle in the IVO treatment ($P<0.001$, Table 1). It should be noted that ADG and BW change did not differ ($P>0.05$) during the first 27 days (data not shown). Therefore, although the IVO treatment was likely effective during the first 27 days, the effective lifespan of the product ended and allowed subclinical reinfestation of parasites during the last 36 days. As most traditional deworming products are only labeled to maintain effectiveness for 30 days, this is not surprising. More surprising however, is that such a low concentration of fecal eggs in the IVO treatment (5.138 eggs/gram) was able to cause a detectable reduction in gain compared with LR heifers.

Although stocker phase performance was improved in the LR treated heifers, this did not translate to the feedlot. Final fecal egg counts were nearly undetectable prior to transport to slaughter (Table 2). Moreover, there were no differences in feedlot performance or carcass characteristics due to either stocker phase or feedlot phase treatment ($P\geq0.10$, Table 2). Furthermore, there were no interactions between treatments ($P\geq0.09$, Table 2).

Conclusions

Based on data presented in this study, in cattle that have been effectively managed to reduce or eliminate internal parasite infection during a grazing period, there may be no benefit to deworming at feedlot arrival. However, even at surprisingly low levels of infection during the stocker phase, parasites can have a significant impact on stocker performance. These data highlight the importance of parasite control during the stocker phase, even at subclinical infection levels.

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Table 1. Performance characteristics and fecal egg counts of fall-born Angus heifers grazing spring and summer pasture in southwest Iowa after treatment with a short- or long-lasting injectable dewormer.[1]

	Treatment[2]			
Item	**IVO**	**LR**	**SEM[3]**	**P-Value**
Body Weight, lb				
Start	610	610	9.1	0.96
Final	686	698	9.9	0.38
Change	76	88	3.2	0.01
ADG, lb	1.21	1.40	0.05	0.01
BCS[4]				
Start	5.17	5.12	0.07	0.67
Final	4.92	4.90	0.06	0.80
Change	-0.24	-0.22	0.07	0.82
Fecal egg count, eggs/g				
Treatment initiation	0.897	0.629	0.413	0.65
End of grazing period	5.138	0.073	0.426	< 0.001
Change	4.229	-0.550	0.456	< 0.001

[1]Heifers were allowed 35 days on pasture prior to treatment, and had not been dewormed prior to pasture turn-out or study treatment. The stocker period lasted 6 days.
[2]IVO=Ivomec® injectable; LR=LongRange®.
[3]n=30.
[4]BCS (body condition score) measured on 1-9 scale (1=emaciated, 9=obese; Wagner et al., 1988).

Table 2. Feedlot and carcass characteristics of fall-born Angus heifers after stocker phase that included treatment with a short- or long-lasting injectable dewormer.

	Treatment[1]							
	IVO		LR			P-Value[3]		
Item	NO	DWRM	NO	DWRM	SEM[2]	Stock	Feedlot	SxF
Final fecal[4], egg/g	0.08	0.30	0.00	0.08	0.10	0.17	0.16	0.52
Body weight, lb								
Feedlot arrival	688	684	702	695	14.3	0.39	0.68	0.91
Feedlot exit	1,163	1,160	1,175	1,146	23.8	0.98	0.49	0.58
ADG, lb	3.17	3.17	3.16	3.01	0.10	0.38	0.47	0.43
HCW, lb	699	694	713	691	15.9	0.71	0.38	0.61
Dress, %	62.7	62.3	63.2	62.7	0.45	0.26	0.34	0.92
Backfat, in.	0.50	0.49	0.51	0.53	0.03	0.37	0.86	0.51
KPH, %	2.27	2.30	2.30	2.47	0.06	0.10	0.10	0.27
Ribeye area, in.^{2}	12.07	11.97	11.93	11.86	0.23	0.60	0.70	0.94
Yield grade	3.01	2.99	3.13	3.16	0.09	0.12	0.92	0.80
Marbling score[4]	1,206	1,148	1,176	1,200	23.8	0.64	0.48	0.09
Quality grade[5]	18.6	18.0	18.3	18.5	0.24	0.58	0.41	0.10
Choice or better, %	100	100	100	100		1.00	1.00	1.00
Certified Angus Beef, %	93.3	66.7	86.6	86.6		0.80	0.23	0.23
Prime, %	13.3	13.3	13.3	20.0		0.74	0.74	0.74

[1]IVO=Ivomec® injectable during stocker phase; LR=LongRange® during stocker phase, NO=no deworming treatment at feedlot arrival processing, DWRM=dewormed with Ivomec® injectable at feedlot arrival processing

[2]n=15.

[3]P-values of main effects of stocker and feedlot treatment and the stocker × feedlot interaction.

[4]Fecal samples collected at feedlot exit.

[5]Marbling score: 1,000=Small^0, 1,100=Modest^0, 1,200=Moderate^0, etc.

[6]USDA quality grade: 17=Choice$^-$, 18=Choice^0, 19=Choice$^+$, etc.