Effects of Internal Parasite Infection at Feedlot Arrival on Performance and Carcass Characteristics in Beef Steers

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Summary and Implications

The performance and carcass characteristics of 43 beef steers were evaluated relative to internal parasite burden at feedlot arrival. Despite being effectively dewormed at feedlot entry, cattle with more significant worm burdens on arrival had lesser body weights throughout the feeding period and tended to have more days on feed. Even with a tendency for more days on feed, more heavily infected cattle also tended to have lesser marbling scores, dressing percentages, KPH, and back fat. However, there were no differences in ADG throughout the finishing period, REA, yield grade, or HCW relative to initial worm burden. These data indicate that larger worm burdens at feedlot arrival can have long-term effects on body weight and carcass characteristics even when deworming procedures are successful. This information highlights the importance of internal parasite control during the grazing and growing period.

Introduction

Severe parasite infections are sometimes associated with decreased growth and performance and clinical disease. Grazing cattle are exposed to many parasites and appropriate deworming strategies can help to minimize parasite burdens while 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 feedlot performance and carcass characteristics relative to worm burden at feedlot arrival.

Materials and Methods

Forty-three crossbred steers from the Southeastern U.S. (527 ± 77 lb initial BW; 3.95 ± 0.50 initial BCS; 387 ± 132 days initial age) were used to examine the impact of internal parasite infections of beef steers at feedlot arrival on subsequent feedlot performance and carcass characteristics. Upon arrival at a SW Iowa feedlot, fecal samples were obtained and cattle were dewormed with a label dose of Eprinex® (eprinomectin). Fecal samples were obtained 24 d later for repeat analysis. Cattle were fed as a singular pen and were harvested on 2 different dates 14 days apart based on estimated carcass composition. Serial weights and carcass data were collected by Tri-County Steer Carcass Futurity. Total fecal egg count (FEC) on d 0 was 92.07 ± 109.50 eggs per gram (EPG) with a range from 0 to 466 EPG. Parasite population was 92.35% strongyles, and coproculture revealed strongyle population was 58% Cooperia, 14% Haemonchus, and 28% Ostertagia. Fecal exams performed on d 24 detected 0 parasites. For post hoc statistical analysis, steers were categorized into 2 groups based on FEC at processing (≤99 EPG, **LO**; ≥ 100 EPG, **HI**). Data were analyzed using the MIXED procedure of SAS, with REPEATED measures used where appropriate. The HI cattle were younger than LO cattle ($P = 0.02$; 318 d vs. 418 d); therefore, age at arrival was used as a covariate when significant ($P \leq 0.10$). In addition, as days on feed tended to be greater ($P = 0.06$) for HI than LO cattle, days on feed was analyzed for significance as a covariate in carcass characteristics models, but was found not significant ($P > 0.10$) and therefore removed.

Results and Discussion

Body weight data over the duration of the trial is summarized in Figure 1. Over the duration of the feeding period, HI cattle had lesser BW than LO cattle ($P = 0.03$). When compared to LO, HI had reduced ADG during the first 24 d on feed ($P = 0.05$; Table 1); however, overall ADG for the feeding period did not differ between groups ($P = 0.62$). Moreover, HI steers tended to require more days on feed ($P = 0.06$; Table 1) when compared to LO. When compared to LO, HI tended to have lesser marbling scores ($P = 0.08$; Table 1), dressing percentages ($P = 0.09$) , KPH ($P = 0.07$), and back fat ($P = 0.07$) at harvest. Rib eye area, yield grade, and HCW did not differ between classification groups ($P \geq 0.15$; Table 1). Although not statistically significant, there were numerical differences between groups in terms of health treatments, cost of health treatments, income, and profit/loss. Numerically HI cattle were treated for clinical disease more times ($P = 0.14$; Table 1) and thus incurred more health treatment costs ($P = 0.13$). Moreover, HI cattle hadless total income per head ($P = 0.42$; Table 1) and lost more money per head ($P = 0.27$). Although the sample size was limited in the current study and caution should be used when extrapolating to larger platforms, the data indicate numerical economic differences that would likely be of interest to most cattle feeders. In summary, although steers with fecal egg counts above 100 eggs per gram at feedlot arrival responded to anthelmintic intervention, they had lesser BW throughout the feedlot phase and tended to require more days on feed, have altered carcass composition and reduced marbling scores at slaughter. These effects have the potential to affect the

overall profitability of fed cattle, again reinforcing the value of effective internal parasite control through the growing and grazing period prior to feedlot entry.

Acknowledgements

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Table 1. Effects of internal parasite infection level at feedlot arrival on subsequent feedlot performance, carcass characteristics, and profitability of Southeastern U.S. beef steers finished in a Southwest Iowa feedlot.

	Classification[1]			
Item	LO	HI	SEM[2]	P-Value
Delivery age, d	418	318	34.6	0.02
Fecal egg count at delivery, EPG[3]	31.9	228.9	16.65	< 0.0001
Days on feed	175.7	179.0	1.40	0.06
Average daily gain, lbs				
Day 0-24	4.09	3.52	0.23	0.05
Overall	3.61	3.54	0.11	0.62
Health				
Treatments, #[4]	0.43	1.00	0.32	0.14
Total cost of treatments, $	10.51	30.33	10.69	0.13
Carcass characteristics				
Hot carcass wt, lbs	714	695	16.0	0.34
Dressing percent	61.32	60.45	0.42	0.09
12th rib back fat, in	0.48	0.43	0.02	0.07
Ribeye area, in^2	12.07	11.73	0.23	0.22
KPH, %	2.42	2.15	0.12	0.07
Yield grade	3.04	2.86	0.10	0.15
Marbling score[5]	1112	1064	22.27	0.08
Quality grade[6]	17.4	17.4	0.20	0.95
Income, $	1429	1392	37.66	0.42
Profit/loss, $	(107.37)	(146.28)	28.94	0.27

[1] Fecal egg count of steers at feedlot arrival (LO ≤ 99 eggs per gram; HI ≥ 100 eggs per gram).
[2] Largest SEM reported (LO: n = 39; HI: n = 13).
[3] Measured in eggs per gram of feces
[4] Number of times steers were treated for health related issues
[5] Marbling score: 900 = Slight 0, 1000 = Small 0, 1100 = Modest 0, etc.
[6] Quality grade: 15 = Select$^-$, 16 = Select$^+$, 17 = Choice$^-$, 18 =Choice^0, 19 = Choice$^+$, etc.

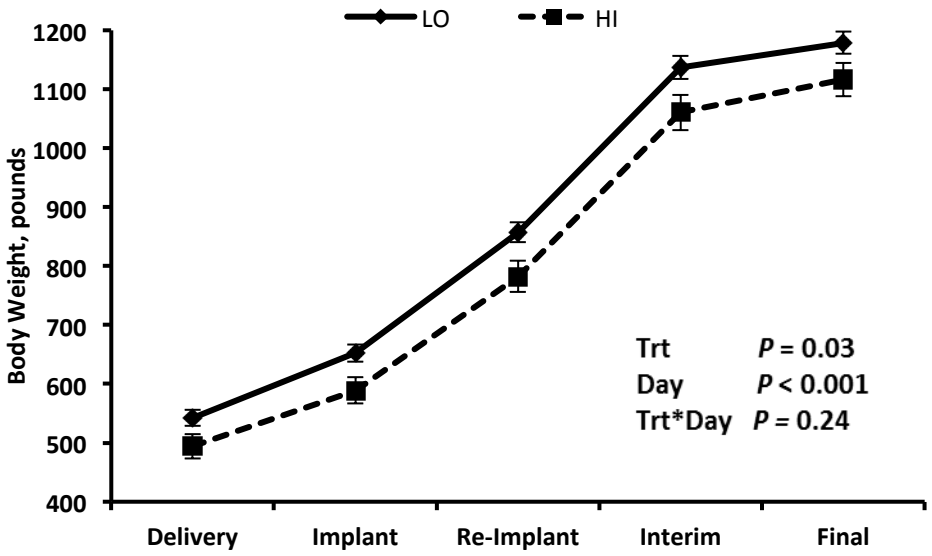

Figure 1. Body weight of steers during the feedlot phase that had a LO (≤ 99 eggs per gram) or HI (≥ 100 eggs per gram) internal parasite fecal egg count at feedlot arrival.