K-STATE Research and Extension

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Evaluation of the Productivity of a Single Subcutaneous Injection of LongRange in Stocker Calves Compared With a Positive (Dectomax) and a Negative (Saline) Control

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Introduction

Subclinical parasitism is commonly observed in stocker cattle. Treatment of internal parasites helps to improve weight gains, feed conversion, and immune status and decreases morbidity and mortality of beef cattle (Hawkins, 1993). Some of the most concerning classes of internal parasites include *Cooperia*, *Haemonchus*, and *Ostertagia*. Commonly used anthelmintics come in the form of pour-ons, oral drenches, and subcutaneous injections. A majority of these drugs are designed to be administered in a single dose and provide defense against stomach worms for approximately 14 to 42 days, but the typical grazing season lasts for approximately 120 days. For grazing cattle to have season-long protection from parasites, they may require a second dose of anthelmintic treatment, which would require cattle to be gathered and processed through a chute in the middle of the grazing season. LongRange (Merial, Duluth, GA) is the first single-dose extended release anthelmintic that provides approximately 100 to 150 days of protection. This is accomplished by combining two forms of the active ingredient: one that is released into the blood immediately after injection and a second that consists of a slow-release polymer that releases the active ingredient gradually throughout the grazing period. The objective of this study was to measure body weight productivity, fecal egg counts, and fly repellent capabilities of LongRange when administered once subcutaneously at 1.0 mg/kg body weight as a long-acting solution compared with a commercially available injectable (Dectomax; Zoetis, Florham Park, NJ) and saline in stocker cattle.

Experimental Procedures

Crossbred heifers (n = 288; 56 ± 64.8 lb initial body weight) were double-stocked on Flint Hills native pasture for 96 days from May to August at 230 lb/a. Heifers were completely randomized based on initial weight across 15 pastures at the Kansas State University Beef Stocker Unit with five pastures per treatment. The three treatments were LongRange administered at 1 cc/110 lb subcutaneously; Dectomax administered at 1 cc/110 lb subcutaneously; and saline administered at 1 cc/100 lb subcutaneously. All treatments were administered only once at the beginning of trial. Individual weights

were taken on days 0, 47, and 96. Fecal samples were collected from five randomly selected heifers from each pasture and analyzed for fecal egg counts (FEC). Fly counts started on day 50 and continued weekly until the end of the trial. Pictures of one side of the heifers were taken using a DSLR camera with a telephoto zoom lens and uploaded to photo editing software Gimp 2 (Softonic, Barcelona, Spain), making it possible to count flies by hand.

Results and Discussion

At the conclusion of the trial, there was no significant difference in weight gain over the 96 days, but there was a 14-lb advantage between the LongRange and Dectomax treatments (Table 1). Heifers came in with a very low worm load and did not acquire a significant amount to reach the economic threshold for negative performance, which is greater than 200 to 300 eggs per gram (Ward et al.; 1991). The trial heifers' highest worm load tested was 10.8 eggs per gram of feces. Fecal egg counts were similar among treatments upon initial collection ($P = 0.37$) and in the middle collection ($P = 0.34$), but at the final collection, Dectomax had lower ($P = 0.05$) fecal egg counts compared with the saline and LongRange treatments (Table 2). LongRange-treated heifers had lower ($P = 0.04$) fly counts than Dectomax and saline-treated heifers (Table 3). The horn fly is one of the most common ectoparasites that adversely affects the productivity of beef cattle, and LongRange-treated animals had approximately 28 fewer flies per animal throughout the study. According to Byford et al. (1992), horn fly infestation costs United States cattle producers $730.3 million per year.

Implications

Although the results yielded no difference in worm loads, the use of LongRange could be used as a single product providing protection from both internal and external parasites.

Table 1. Performance response to anthelmintic treatment in grazing crossbred heifer calves

	Treatment[1]				
Weight, lb[2]	LongRange	Dectomax	Control	SEM[3]	*P*-value[4]
Initial	562	556	558	9.7	0.90
Mid	676	674	682	5.5	0.64
Final	728	714	726	6.1	0.27

[1] LongRange (Merial, Duluth, GA); Dectomax (Zoetis, Florham Park, NJ).
[2] Individual body weight measured on trial day 0 (initial), day 47 (mid), and day 96 (end).
[3] Standard error of the least squares means (n = 5 pastures per treatment).
[4] Observed significance levels for anthelmintic treatment.

Table 2. Internal parasite response to anthelmintic treatment in grazing crossbred heifer calves

	Treatment[1]				
Fecal egg counts[2]	LongRange	Dectomax	Control	SEM[3]	*P*-value[4]
Initial	0.056	0.040	0.152	0.057	0.37
Mid	0.200	0.600	0.800	0.282	0.34
Final	0.880[ab]	0.272[b]	1.736[a]	0.369	0.05

[1] LongRange (Merial, Duluth, GA); Dectomax (Zoetis, Florham Park, NJ).
[2] Individual body weight measured on trial day 0 (initial), day 47 (mid), and day 96 (end).
[3] Standard error of the least squares means (n = 5 pastures per treatment).
[4] Observed significance levels for anthelmintic treatment.

Table 3. Fly repellent response to anthelmintic treatment in grazing crossbred heifers

	Treatment[1]				
Fly counts[2]	LongRange	Dectomax	Saline	SEM[3]	*P*-value[4]
Mean	79.2[a]	106.6[b]	109.1[c]	9.39	0.04

[1] LongRange (Merial, Duluth, GA); Dectomax (Zoetis, Florham Park, NJ).
[2] Individual fly counts per heifer per one side.
[3] Standard error of the least squares means (n = 5 pastures per treatment).
[4] Observed significance levels for anthelmintic treatment.