Effects of Extended-release Eprinomectin on Replacement Heifer Performance and Reproductive Success

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Summary and Implications

This study evaluated the effect of extended-release eprinomectin on production parameters and reproductive success of yearling fall replacement heifers. Heifers were treated with an ivermectin (CONV) or an injectable extended-release eprinomectin (EPR). There were no differences between treatments at initial body weight (BW). However, subsequent body weights taken 7 months and 12-months post-treatment demonstrated heavier body weight, greater overall weight gain and a greater average daily gain for heifers treated with EPR. Heifers treated with EPR had greater pregnancy rates to AI and greater overall pregnancy rates than CONV. Also, a greater proportion of EPR heifers calved in the first 21 days of the subsequent calving season. Results from this study indicate improved performance and greater reproductive success for replacement heifers treated with extended-release eprinomectin.

Introduction

Parasitic infections in cattle are known to negatively impact cattle performance by depressing growth and development and are most detrimental to young, growing cattle. These young, growing, and reproducing animals are most severely impacted by parasitic disease due to their increased nutritional demands.

It has been demonstrated that anthelmintic treatment which reduces or eliminates gastrointestinal worm burdens can positively influence cattle productivity by increasing a plethora of parameters including weight gain, reproductive efficiency, and carcass characteristics. However, relatively few studies have been conducted to elucidate the effect of anthelmintic treatment on reproductive parameters in grazing beef heifers. The objectives of this study were to assess performance parameters and reproductive efficiency of yearling heifers treated with extended-release eprinomectin during the developmental period.

Materials and Methods

To study the effects of extended-release eprinomectin on replacement heifer performance and reproductive efficiency, a herd of 74 fall-calving replacement heifers were allocated to one of two anthelmintic treatments. In August of 2015, prior to their first breeding season, heifers were weighed and treated with either an injectable ivermectin (Vetrimec™, VetOne, Boise, Idaho; n=33; CONV) or injectable extended-release eprinomectin (LongRange™, Merial, Duluth, GA; n = 41; EPR).

Following treatment, groups were kept on separate- but like-pastures (one treatment per pasture; 2 total pastures). In December, all yearling heifers were monitored for heats over a 25-day period and artificially inseminated if a standing heat was observed. Following this period, all heifers were exposed to a bull for a 47-day natural service breeding season. Forty-five days after the bulls were removed, heifers were weighed and evaluated for both pregnancy to AI and overall breeding season pregnancy rates.

In August 2016, heifers were weighed and all animals were dewormed with injectable extended-release eprinomectin prior to their first calving season. Body weights, ADG, AI pregnancy rates, overall pregnancy rates, and calving distribution were evaluated. Performance results were analyzed using PROC MIXED of SAS. Overall pregnancy, conception to AI, and calving distribution were analyzed using GLIMMIX in SAS (SAS Inst. Inc., Cary, NC).

Results and Discussion

Performance results are reported in Table 1. Initial BW did not differ between groups ($P = 0.98$). However, EPR heifers were heavier at spring pregnancy evaluation ($P < 0.001$) and tended to weigh more a year after initial treatment ($P = 0.10$). Moreover, when compared to CONV, EPR also had a greater overall change in BW and higher ADG ($P < 0.001$) from the time of initial treatment to the time of pregnancy evaluation the following spring. Pregnancy rates to AI ($P = 0.03$) and overall breeding season pregnancy rates ($P = 0.03$) were greater for EPR compared to CONV. Subsequently, EPR began calving 10 days sooner and had an average Julian calving date that was 12 days earlier ($P = 0.06$) than CONV. Moreover, EPR had a larger percentage of calves born in the first 21 days of the calving season compared to CONV ($P = 0.04$).

Data from the US Meat Animal Research Center have illustrated that heifers which breed earlier in the breeding season and calve earlier the subsequent year have greater reproductive success in their second breeding season, wean heavier calves, and have greater longevity in the herd. Although more validation is needed, these data implicate economically-relevant production advantages for fall-bred heifers treated with extended-release eprinomectin compared to a convention injectable dewormer.

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Table 1: Performance of fall-calving replacement heifers treated with different anthelmintic treatments during their yearling grazing season.

	Treatment[1]			
Item	CONV	EPR	SEM[2]	P-Value[3]
Body weight, lbs				
Treatment, August 2015	604	605	11.0	0.98
Pregnancy diagnosis, April 2016	770	825	11.4	<0.001
Deworming, August 2016	947	974	12.7	0.10
Body weight change[4]				
Total, lbs	166	225	11.0	<0.001
Percent change	27.9	38.8	3.13	0.01
ADG, lbs	0.67	0.91	0.04	<0.001
Pregnancy Success, % (no./no)				
Artificial insemination	47 (8/17)	77 (20/26)	---	0.03
Entire breeding season	73 (24/33)	95 (39/41)	---	0.02
Average calving date, Julian	285	273	4.8	0.06
Cumulative calving distribution,[5] %				
21 days	16.7	44.4	---	0.04
42 days	58.3	72.2	---	0.27
63 days	79.2	86.1	---	0.48
84 days	100	100	---	0.99

[1]Treatment: CONV = Vetrimec 1% (ivermectin); EPR = LongRange.

[2]Larger SEM presented (n = 33 CONV; n = 41 EPR).

[3]*P*-value: Significant $P \leq 0.05$; Tendency $0.05 < P \leq 0.10$.

[4]Calculations based on weight changes from August 2015 to April 2016.

[5]Of heifers that became pregnant in 2015, cumulative proportion of total that calved by the end of each 21-d period during the 2016 calving season.