Effects of Extended-release Eprinomectin on Cow/calf Performance and Reproductive Success in a Fall-calving Herd

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Claire Andresen, Graduate Student;
Patrick Gunn, Assistant Professor, Iowa State University,
Department of Animal Science

Summary and Implications

This study evaluated the effects of extended-release eprinomectin on performance parameters and reproductive efficiency of fall-calving cows. Cows were treated with either a conventional, short duration dewormer (CONV) or an injectable extended-release eprinomectin (EPR). Change in body weight (BW) and average daily gain were greater in EPR cows compared to CONV treated cows. Pregnancy rates tended to be greater for EPR than CONV cows. Calves from dams treated with EPR were younger at weaning, but had greater weaning weights than calves from CONV dams. Results from this study indicate performance and reproductive advantages for dams treated with EPR as well as possible indirect performance advantages for calves whose dams were treated with EPR.

Introduction

Parasitic infections in cattle are known to negatively impact cattle performance by depressing a number of production parameters including weight gain, milk production, reproductive efficiency, and carcass quality. Anthelmintic drugs have long been used in commercial cattle production as a means to prevent internal parasitic infection and improve production in both cow/calf operations and feedlot settings.

Anthelmintics used in cow/calf production have demonstrated positive effects on calf growth, dam weight gain and have been implicated in improving pregnancy rates. In 2012, Merial, Inc. released the extended-release version of their injectable anthelmintic drug, eprinomectin. This product label claims 100-150 days of parasite protection with one injection. While this anthelmintic has been proven to reduce worm burdens in cattle, little research has been conducted to study the effect of anthelmintic treatment on reproductive performance in cows and heifers. Therefore, the goal of this study was to assess performance parameters and reproductive success of fall-calving cows treated with extended-release eprinomectin prior to calving and re-breeding.

Materials and Methods

To study the effects of extended-release eprinomectin on performance parameters and reproductive success of cows, a herd of 119 fall-calving cows was used. Cows were managed in two groups by age (first-calf heifers [n = 38; and ≥ 3 years of age [n = 81]). Each age group was managed on a singular but separate pasture. In August of 2015, prior to calving season, cows were weighed and assigned to either: 1) injectable ivermectin (Vetrimec™; VetOne, Boise, Idaho; n=53; CONV) or 2) injectable extended-release eprinomectin (LongRange™; Merial, Duluth, GA; n = 66; EPR). Cows were randomly allocated to treatment within age group, thus both treatments were represented in each pasture. Breeding was accomplished using non-synchronized natural service. The 90-d breeding season began in late November of 2015. In April of 2016, all cows were weighed and palpated to determine overall breeding season pregnancy rates. Animals continued to be managed by age on separate pastures and were monitored through the subsequent calving season. Dam BW, performance, overall pregnancy rates, calving interval, as well as performance data from the 2015 calf crop were evaluated. Because animals were randomly assigned to treatment and not stratified by initial BW, treatment effect on performance was primarily evaluated based on change in BW and ADG. Calf sex was utilized as a main effect when analyzing weaning weights. Performance results were analyzed using PROC MIXED of SAS. Pregnancy data and calving interval were analyzed using GLIMMIX in SAS (SAS Inst. Inc., Cary, NC).

Results and Discussion

Dam performance results and reproductive measurements are reported in Table 1. There was a treatment × age interaction for both treatment weight and pregnancy check weight ($P = 0.02$; data not shown). Specifically, treatment weights of first-calf heifers did not differ but in older cows, EPR dams were significantly heavier at treatment ($P < 0.001$). This initial weight difference also translated to significant weight differences at time of pregnancy checks in older cows. This is a reflection of study design as animals were randomly allocated to treatment and not stratified by weight. However, evaluation of dam performance shows cows treated with EPR lost less BW ($P = 0.03$) and lost a lower percent of BW ($P = 0.009$) between treatment and pregnancy diagnosis than did CONV cows. While both groups of cows lost weight over the course of data collection, daily BW losses (ADG) for cows treated with EPR were less ($P = 0.03$). As expected, first-calf heifers tended to have greater loss as a percent of initial BW over the calving and breeding season ($P = 0.07$; data not shown) when compared to older cows; however, there was no treatment × age interaction ($P = 0.22$) for post-treatment cow performance.

Cows treated with EPR tended to have greater overall pregnancy rates ($P = 0.10$; Table 1) than CONV. While

calving interval was not statistically different between groups ($P = 0.14$), EPR had a 7 d shorter calving interval compared to CONV. This shorter calving interval provides potential for an economic benefit, not only through increased calf weaning weight in the subsequent year, but also through reproductive advantages such as increased post-partum recovery time prior to initiation of breeding season

Calf performance for the 2015 calf crop are reported in Table 2. Calves from EPR dams were younger at weaning ($P = 0.007$), tended to have a greater actual weaning weight ($P = 0.09$), and thus had greater age-adjusted weaning weights ($P < 0.001$) when compared to calves from CONV dams. As expected, calves from older cows had greater weaning weights ($P < 0.001$) when compared to first-calf

heifers although there was no treatment × age interaction ($P = 0.84$). The results of this study indicate that treatment with extended-release eprinomectin may result in performance and reproductive advantages for dams. Dam treatment with extended-release eprinomectin may also have an indirect impact on growth and performance of their offspring.

Table 1: Performance of fall-calving cows treated with different anthelmintic treatments during the grazing season.

Item	Treatment[1]		SEM[2]	P-Value[3]
	CONV	EPR		
BW				
Treatment, August 2015	1111	1157	14.6	0.02
Pregnancy assessment, April 2016	935	1005	19.5	0.01
Change in[4], lbs.	-175	-137	13.2	0.03
Change in[4], %	-15.7	-11.8	1.1	0.009
Performance				
ADG, lbs[4]	-0.69	-0.53	0.05	0.03
Reproduction				
Pregnancy rate, % (no./no.)	88.6 (47/53)	96.9 (63/65)	---	0.10
Calving interval[5], days	368	361	3.2	0.14

[1]Treatment: CONV = Vetrimec 1% (ivermectin); EPR = LongRange.
[2]Larger SEM presented (n = 53 CONV; n = 66 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]Pregnancy rate for 2016; natural service only; only one pregnancy diagnosis.
[6]Calving interval from 2015 calving to 2016 calving.

Table 2: Performance of fall calves whose dams were treated with different anthelmintic treatments during the grazing season.

Item	Treatment[1]		SEM[2]	P-Value[3]
	CONV	EPR		
Weaning weight[4], lbs., actual	493	520	11.4	0.09
Weaning weight[5] lbs., adjusted	480	529	10.4	<0.001
Age at weaning, days	235	229	1.8	0.007

[1]Treatment: CONV = Vetrimec 1% (ivermectin); EPR = eprinomectin.
[2]Larger SEM presented (n = 53 CONV; n = 66 EPR).
[3]P-value: Significant $P \leq 0.05$; Tendency $0.05 < P \leq 0.10$.
[4]Actual weaning weight.
[5]Adjusted statistically for age difference at weaning.