Effect of an Eprinomectin Treatment at Fall Housing on Milk Production of Dairy Cows in Québec

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Introduction

Dairy cattle in Québec are exposed to gastrointestinal nematodes throughout the grazing season, from May to October. The clinical and economic impact of these parasites, especially *Ostertagia ostertagi,* is well documented in replacement animals. In severe cases, clinical disease (diarrhea, weight loss and death) can be seen, but in most cases the infestations are subclinical and may lead to decreased productivity (reduced average daily gain). Many deworming products and protocols have been proposed to enhance dairy cattle productivity. The efficacy and economic justification of some of those are not always evident, especially for lactating animals. Animals over 2 years of age rarely show clinical signs of digestive parasitism, and clinical trials using a wide range of parasite control products have shown variable effects on lactation productivity. The discovery of the avermectin endectocide family was a major advance in clinical parasitology. Avermectins were shown to be highly effective and to improve dairy cattle productivity but they only were available for use in heifers and during the dry period, due to milk withdrawal times. The recent approval of eprinomectin with no witholding time for meat or milk has allowed the treatment of dairy cattle of all ages at any time of lactation.

The objective of this study was to determine the response in milk production of dairy cows treated with eprinomectin at fall housing.

Materials and Methods

Cows from 14 dairy herds from southern Québec were used in the study. Participating herds were selected based on a rolling herd milk production average of greater than 15,400 lb (7000 kg) per year, previous pasture exposure and anthelmintic treatment history. Cows and heifers due to calve after the treatment date, or freshened shortly before but with no milk weights before the treatment day, were enrolled in the study. The last calving occured March 31, 1998. On the day of the treatment, animals within each herd were paired by lactation number, days in milk or expected calving date, and previous lactation milk yield or body weight (for heifers). This pairing was intended to ensure group homogeneity and was not required for statistical analysis. Each pair-mate was allocated to treatment or control group by coin toss. Animals with no pair-mate were assigned to one of the groups by coin toss.

Treatment consisted of Ivomec® Eprinex™ Pour-On (Merial Canada Inc) at a dose of 500 mg of eprinomectin/kg B.W (1 ml/10 kg). Controls received placebo (vehicle) at a rate of 1 ml/10 kg. The investigators and producers were blinded to the treatment. Treatment was administered from November 4th to November 21, 1997.

Production data were retrieved from the PATLQ inc, Québec DHI agency. Health and culling data were obtained from computerized health files from the participating veterinary clinics on the DSA software (Dossier de Santé Animale, ASTLQ inc.).

Data were analyzed using a factorial ANOVA design with covariate using the GLM procedure (SAS 6.12, SAS Institute Inc). Milk production, evaluated by the first 305-day milk projection after 3 milk weights, was compared with respect to treatment (TX: placebo or Eprinex), herd of origin (HERD) and lactation number (LACT: 2 or 3+), with the previous lactation's 305-day milk yield (PMILK) as a covariate. Cows at their first lactation were analyzed separately, with TX and HERD as factors. The α-value was set at 0.05.

Results

The analysis included 61 cows at first lactation, 84 at second lactation and 145 at third lactation and more. Results are expressed as mean ± standard deviation (range; least square mean).

Treated first-lactation cows (n=31) were projected to produce 16,051 ± 2600 lb (7296 ± 1182 kg) of milk (range: 9,715 - 23,137 lb (4416 to 10517 kg); LSM: 15,880 lb (7218 kg)), and controls (n=30) were projected at 15,497 ± 2,110 lb (7044 ± 959 kg) of milk (range: 11,539 - 19,243 lb (5245 to 8747 kg); LSM: 15,147 lb (6885 kg)).

Table 1. Effects of treatment (TX) with eprinomectin or a placebo at fall housing on milk projection of cows in first lactation with respect to herd of origin (HERD).

Factor	df	F	P
TX	1, 45	1.49	0.2284
HERD	7, 45	3.09	**0.0095**
TX*HERD	7, 45	0.46	0.8546

61 cows from 8 herds.

Results of the GLM procedure are shown in Table 1. Treatment with eprinomectin at fall housing did not significantly changed milk projection (P=0.2284), but the herd of origin had a significant impact on it (P=0.0095).

Treated multiparous cows (n=113) were projected at 19,107 ± 3256 lb (8685 ± 1480 kg) (range: 12,016 to 29,077 lb (5462 to 13217 kg); LSM: 19,072 lb (8669 kg)) and controls (n=116) were projected at 19,268 ± 3084 lb (8758 ± 1402 kg) (range: 12,261 to 29,570 lb (5573 to 13,441 kg; LSM: 19,395 lb (8816 kg)). Results of the GLM procedure are shown in Table 2. Milk projection was influenced by the previous milk production (P<0.0001) and the herd of origin (P<0.0001), but was not influenced by the treatment with eprinomectin (P=0.3052).

These results suggest that treatment of cows in late fall does not provide a significant benefit to milk production when these cows are due to calve later in the winter or spring. Further investigations are necessary to evaluate the effect of a more strategic eprinomectin treatment in lactating dairy cows during the pasture season, when the nematodes are still in an active phase.

Table 2. Effects of treatment (TX) with eprinomectin or a placebo at fall housing on milk projection of multiparous cows with respect to herd of origin (HERD) and lactation number (LACT: 2 or 3+), with the previous lactation's 305-day milk yield (PMILK) as a covariate.

Factor	df	F	P
TX	1, 198	1.06	0.3052
PMILK	1, 198	88.24	**0.0001**
HERD	13, 198	4.73	**0.0001**
LACT	1, 198	2.67	0.1041
TX*HERD	13, 198	0.66	0.7961
TX*LACT	1, 198	1.24	0.2674

Cows in second lactation (n=84) and third lactation and more (n=145) from 14 herds.