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## Effect of eprinomectin pour-on treatment around calving on reproduction parameters in adult dairy cows with limited outdoor exposure

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### Abstract

The objective of this study was to investigate if treatment of cows with eprinomectin around calving had any beneficial effects on the calving to first artificial insemination interval, calving to conception interval, and number of services per conception in totally- and semi-confined dairy herds. In totally-confined herds lactating- and dry-cows were housed throughout the summer and had no access to pasture. In semi-confined herds lactating- and dry-cows had limited outdoor exposure to a small pasture or paddock but were still fed a ration that met all their nutritional requirements. The study was carried out between February 2002 and February 2003 in 35 herds (2381 cows) located in Quebec, Ontario and Minnesota (USA) participating in a larger clinical trial. The herds kept electronic reproduction records. Cows were randomly allocated to receive eprinomectin or a placebo,

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with treatment being administered on or close to the day of calving. Monthly bulk tank milk samples from each farm were tested with an indirect ELISA using a crude *Ostertagia ostertagi* antigen and these data were averaged over the study year. The optical density ratio (ODR) values were then dichotomized into high and low using a cut-point of 0.50. Treatment effects were analyzed using Cox proportional hazards survival models with herd frailty effects for calving to conception and calving to first service intervals. Aalen's linear hazards model was used to investigate time-varying effects in the Cox models. A random effects poisson regression model was used to model the number of services per conception. Other predictor variables tested in the models were lactation number, calving season, study site, peak milk production, ODR and the lactating- and dry-cow housing variables. Overall, there was no significant effect of treatment on the three indices of reproductive performance. The effect of season of calving depended on how much time had passed since calving. Presumably this effect reflected a seasonal effect at the time of breeding. Hazard of conception in younger cows was higher than in older cows. Early bred cows tended to have a higher number of inseminations per conception than those bred late. The results of the study suggested that eprinomectin treatment at calving was not beneficial to reproduction.

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## 1. Introduction

Studies have shown that anthelmintic treatment of adult dairy cows has a beneficial effect on reproductive performance indices (Walsh et al., 1995). In a study conducted in Canada, cows from pastured herds were treated with eprinomectin (Eprinex<sup>®</sup>) at calving in order to evaluate if treatment had any beneficial effects on reproduction. The study found a marginally significant effect of treatment on the calving to conception interval as well as a significant reduction in the number of artificial inseminations per conception in eprinomectin treated cows (Sanchez et al., 2002c). The same study evaluated the effect of treatment on milk production and found that cows treated with eprinomectin produced 0.94 kg/day of milk more than placebo-treated cows.

Eprinomectin is a third generation macrocyclic lactone endectocide that is suitable for use in dairy cows. It has low milk partitioning coefficient (Shoop et al., 1996) that alleviates the need for a milk withdrawal period. However, determining which cows/herds would benefit from treatment has been difficult. Fecal egg counts have been shown to be an unreliable measure of parasite worm burden in adult dairy cattle (Agneessens et al., 2000; Borgsteede et al., 2000). An indirect microtitre ELISA that uses *Ostertagia ostertagi* antigen (Keus et al., 1981), has been shown to be better able to determine parasite burden than fecal egg counts. Studies have been conducted to investigate the ability of the ELISA to identify cows that would benefit from anthelmintic treatment. The study by Sanchez et al. (2002c) found that among untreated cows, the rate of conception was lower for cows with a high ELISA optical density ratio (ODR) compared to low ODR cows, suggesting that higher parasite burdens had an adverse effect on reproduction.

There have been claims in the past that transmission of gastrointestinal nematodes between cows occurs during housing (Carmel and Todd, 1979). However, there has also

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