Short Communication

Effectiveness of Fluralaner in Ticks Infesting Horses (*Equus caballus*)

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Abstract | In horses, ticks cause a wide range of health and welfare problems; they can cause direct damage such as skin lesions and anemia and indirect problems spreading several infectious diseases, such as papulonodular dermatoses, Lyme disease, and viral encephalitis, or cause parasite-induced abortion. Because of the risk, they represent measures to control their spread, such as restricting global trade and sporting events. Therefore, the efficacy of fluralaner was evaluated against ticks in horses. Horses were treated with fluralaner 25 mg/kg. Most of the ticks were found on the ears (55.63%), the head (23.23%), and the rest of the body (21.12%). Fluralaner appears to provide effective control of ticks for at least 90 days. In this study, with the administration of fluralaner from day 14 after the application, 94% efficacy was observed, and from day 30 until day 90, in addition to ensuring distribution throughout the body without causing discomfort or adverse effects to the horse.

Keywords | Amblyomma, Efficacy, Fluralaner, Horses, Rhipicephalus, Ticks

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INTRODUCTION

According to a rough estimate, 90 million horses worldwide are used for agricultural work and sport (Cunha et al., 2007). In horses, ticks cause a wide range of health and welfare problems; they can cause direct damage such as skin lesions and anemia and indirect problems spreading several infectious diseases, such as papulonodular dermatoses, Lyme disease, and viral encephalitis, or cause parasite-induced abortion. Because of the risk, they represent measures to control their spread, such as restricting global trade and sporting events (Cunha et al., 2007; Gharbi et al., 2018; Kamran et al., 2021). The most frequent tick-borne pathogens are *Babesia caballi, Theileria equi, Borrelia burgdorferi* and *Anaplasma phagocytophilum* (Gharbi et al., 2018). Visible clinical signs associated with the tick have been reported as pruritus, thickened coat, and hemorrhagic areas, in addition to pruritic exanthema, papules, and spots of alopecia with small, ulcerated lesions (Kamran et al., 2020). Unfortunately, the options available for tick control in equines are limited, require frequent reapplications, and may have safety issues, so tick infestations will likely remain a challenge for horse owners (Seo et al., 2020). The objective of this study was to evaluate the efficacy of a flu-

ralaner (Bravecto®, MSD, USA) against ticks in horses.

MATERIALS AND METHODS

Animals

Five females horses and five males were used in the trial, with an average age of 12 (± 5) years, weighing 432 (± 12) kg. Selected animals were evaluated for the presence of ticks and did not receive any acaricides 30 days before the trial.

Treatment

All horses were treated with fluralaner 25 mg/kg. Ticks were counted and identified morphologically on the day (D)1, D7, D14, D30, D45, D60, and D90. No other treatment was administered during the study.

Statistical methods

Data were analyzed using the Wilcoxon matched pairs test with an alpha of 0.05 for comparison between posttreatment measurements.

RESULTS

Two tick species were identified: *Amblyomma cajennense* and *Rhipicephalus microplus*. The most significant number of ticks were found in the ears (55.63%), followed by the head (23.23%) and the rest of the body (21.12%). On D7, tick numbers were significantly reduced by 78.67% (P = 0.0001). On D14, there was a continued decrease in tick numbers compared to initial counts; tick numbers were reduced by 94% (P = 0.0001). By D30, tick numbers were reduced by 99.33% (P = 0.006). From D30 to D90, no ticks were found showing the sustained activity of fluralaner over time. No adverse effects were observed during the clinical trial.

DISCUSSION

Ticks infest horses throughout the year, even in the winter months, and can be found in various regions on horses. So as with small animals, horses can benefit from year-round tick control (Seo et al., 2020). Results from a survey revealed that the use of acaricides is the most common method (76.52%) for control of tick infestation in horses and that the most commonly used acaricide is ivermectin (47% of horse caretakers), while fipronil is the second most used acaricide (45%) (Sundstrom et al., 2021).

Cypermethrin at a concentration of 0.015% and cypermethrin (Volpato et al., 2013), chlorpyrifos, and citronellal together have also been used (Kamran et al., 2020). Besides not being effective against A. cajennense ticks, Amitraz should not be used in horses as it is poisonous to these animals. Acaricide resistance has been reported in several tick species against almost all classes of acaricides, including macrolactones (Cunha et al., 2007). A horse study suggested that acaricide resistance exists against fipronil and ivermectin, as 100 % efficacy was not achieved for any acaricide even after 36 days of treatment (Cunha et al., 2007). In addition, *A. cajennense* species require higher acaricide formulations concentrations (Volpato et al., 2007). Horse keepers have adopted various methods, such as dunk tank, footbaths, portable hand spraying, and the direct pour-on method for acaricide application (Cunha et al., 2007). However, topically applied acaricide treatments may have access difficulties (nasal and ear diverticula), generate discomfort and repulsion in animals (Volpato et al., 2007). In this study, with the administration of fluralaner from day 14 after the application, 94% efficacy was observed, and from day 30 until day 90, no ticks were found present in the horses, in addition to ensuring distribution throughout the body without causing discomfort or adverse effects to the horse.

CONCLUSION

Based on these data, fluralaner effectively controls *A. cajennense* and *R. microplus* ticks for ≥90 days.

CONFLICT OF INTERESTS

No authors have any conflicts of interest.

AUTHORS CONTRIBUTION

Camilo RM; Galia SW; Alberto MC : Investigation; Project administration; Supervision; Validation; Writing-review & editing;
Laura MC: Conceptualization; Resources; Supervision; Validation.
Rafael HC: Conceptualization; Project administration; Supervision; Writing-original draft; Validation.
Ariadna FO: Conceptualization; Methodology; Writing-original draft; Validation.

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