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Analysis of seasonal effect on tick infestation in vechur and crossbred cattle of Kerala

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Abstract
Ticks and tick-borne diseases (TTBD) are important risk factors in cattle production which causes enormous economic loss. There are several other factors responsible for tick infestation - sex, age, lactation, pregnancy and environmental factors. The present study was aimed to analyze the seasonal effect on tick infestation in Vechur and Crossbred cattle of Kerala. The population under study comprised of 45 Vechur and 74 crossbred cattle from the farms of Kerala Veterinary and Animal Sciences University. Tick counts were taken during summer (March to May, 2019) and rainy (June to August, 2019) seasons from the selected animals. Subsequently, the animals were grouped into the four classes on the basis of the tick infestation level and subjective qualification of the larvae and nymph infestation. However; we could not find any tick infestation on any animal during summer and rainy seasons. Therefore, all the animals were grouped in the class: no infestation (absence of adult ticks, nymphs, and larvae). On inquiry, it was revealed that the farm authorities had stopped letting animals for grazing in the field as a measure to control tick infestation in animals. Hence, it is presumed that the absence of field grazing of cattle has drastically curtailed tick infestation.

Keywords: TTBDs, ticks, vechur, crossbred, season

Introduction
Tick and tick-borne diseases (TTBDs) affect 80 percent of the world cattle population particularly in tropical and subtropical countries such as India, Pakistan and Bangladesh [5]. In India, almost all the livestock species suffer from tick infestation and the loss due to TTBDs has been estimated to be approximately US$ 498.7 million per annum [8]. In Kerala, TTBDs are a major concern to the livestock sector as they are the vectors of many haemoprotozoan diseases in cattle [9, 10]. On exposure to ticks, cattle show variation in resistance and susceptibility to tick infestation. This difference in their response is influenced by factor such as sex, age, lactation, pregnancy, and season [11]. Amongst them, season appear to be one contributing factor. Many researchers reported that tick infestation is more during summer than rainy [2] and in contrast it was recommended that rainy and dry seasons did not differ significantly in tick prevalence [4]. Hence the study was aimed to analyze the seasonal effect on tick infestation in Vechur and Crossbred cattle of Kerala.

Materials and method
The design of this experiment was approved by the Institutional Animal Ethics Committee (IAEC) of the College. The present study was aimed to analyze the effect of season on tick infestation in cattle. The population under study comprised of 45 Vechur animals maintained in the Vechur Conservation Centre of Centre for Advanced Studies in Animal Genetics and Breeding (CASAGB), Mannuthy, 44 crossbred cattle from the Instructional Livestock Farm Complex (ILFC), Pookode and 30 crossbred cattle from University Livestock Farm and Fodder Research and Development Scheme (ULF & FRDS), Mannuthy, Thrissur. Tick counts were taken during summer (March to May 2019) and rainy (June to August 2019) seasons from the selected animals using the method described by Wharton and Utech (1970). All the fully or partially engorged female ticks (between 4.5 and 8.0 mm in length) belonging to the species of *Rhipicephalus* and *Haemaphysalis* on the left side of the animal's body were counted. Then the number was multiplied by two to get the tick count. Afterward, the animals were grouped into four classes according to the tick infestation and subjective qualification of the larvae and nymph infestation *viz.* no infestation (absence of adult ticks, nymphs and

larvae); low infestation (between 1 to 10 fully or partially engorged females and few larvae and nymphs); intermediate infestation (between 11 and 30 fully or partially engorged females and an intermediate number of larvae and nymphs) and high infestation (more than 30 fully or partially engorged females and several larvae and nymphs) [4].

Results and discussion

The study included taking tick counts during summer and rainy seasons from the selected animals. Subsequently, the animals were grouped into the four classes on the basis of the tick infestation level and subjective qualification of the larvae and nymph infestation. However, we could not find any tick infestation on any animal during summer and rainy seasons. Therefore, all the animals were grouped in the class: no infestation (absence of adult ticks, nymphs, and larvae). On inquiry, it was revealed that the farm authorities of the ILFC, Pookode had stopped letting animals for grazing in the field as a measure to control tick infestation in animals. The ULF & FRDS, Mannuthy and the Vechur Conservation Centre of CASAGB, Mannuthy were also not letting the animals for grazing in the field. Hence, it is presumed that the absence of field grazing of cattle has drastically curtailed tick infestation in the animals under our study. The importance of grazing as a risk factor in tick infestation in cattle was also reported by Akhil *et al.* (2019) [1] who observed that tick infestation was more in grazing animals when compared to stall-fed cattle. Furthermore, Mapholi *et al.* (2016) [7] suggested that so as to find out the resistance or susceptibility of the animal, tick count needs to be collected when the animals had adequate exposure to ticks. If the animals were not sufficiently exposed, they would not get the opportunity to exhibit their genotype for resistance and the susceptible animals would be wrongly classified in the resistant group [3].

Conclusion

In this research, it was found that all the animals were free from ticks, larvae and nymph during both the seasons, probably because of lack of grazing. Hence, in future studies to find out seasonal effect on tick infestated animals, the farmer herds should be considered where the likelihood of getting tick infestated animals is high.

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