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Seroprevalence of *Coxiella burnetii* (Q Fever) and the Impact of Farm Management Practices on Tick Infestation in Ruminants of Punjab, Pakistan

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Ticks are recognized as potential vectors of *Coxiella burnetii*, a gram-negative, obligate intracellular bacterium and the causative agent of Q fever, a zoonotic disease affecting humans and a wide range of animals. This study aimed to assess the seroprevalence of Q fever in ruminants and the relationship between various farm management practices and the tick prevalence in livestock of four districts in Punjab, Pakistan. Thus, 96 farms were surveyed through structured questionnaires, each rearing cattle, buffaloes, goats, and sheep. Serum samples were collected from selected ruminants at each farm for detection of *Coxiella burnetii* antibodies. Further, ticks were screened by qPCR for *C. burnetii* and positive samples are currently undergoing further analysis through DNA sequencing. Overall, the *Coxiella burnetii*-seropositivity in ruminants was 12.10% (93/768). The seroprevalence varied between ruminant species, with 16.40% (63/384) in small ruminants and 7.55% (29/384) in large ruminants. The highest prevalence of anti- *Coxiella burnetii* antibodies (21.35%) was recorded for goats, followed by 11.97% for sheep, 9.37% for cattle and the lowest with 5.72% for buffaloes. The Q fever seropositivity was highest in Kasur with 7.29% (28/384) and followed by 7.03%, 6.51%, and 3.38% in Lahore, Bahawalpur, and Chakwal, respectively. All surveyed farms tested positive for coxiellosis. Similarly, high tick infestation was found in 85.4% of farms, with Bahawalpur showing a 100% infestation ratio. A logistic regression model identified farm bedding and the total number of animals as statistically significant risk factors for tick infestation at the farm. In this scenario, longitudinal studies are essential to understand the dynamics of tick infestation and the transmission of *Coxiella burnetii* in ruminants. Effective tick management practices may reduce the tick burden and mitigate the associated risk of zoonotic transmission of Q fever.

Keywords

Seroprevalence; *Coxiella burnetii*; Ruminants; Tick infestation; Farm management; Pakistan

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Professional Status of the Speaker

PhD Student

Junior Scientist Status

Yes, I am a Junior Scientist.

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