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Frequency of Theileriosis in Cows in Tehsil Paharpur, Dera Ismail Khan

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ABSTRACT

Objective: *This study aimed to investigate the prevalence of theileriosis in cows within Tehsil Paharpur, District Dera Ismail Khan, Pakistan.* ***Materials and Methods:*** *A total of 384 blood samples were collected randomly from cows in Tehsil Paharpur over a year (2021-22) and examined microscopically for Theileria parasite detection. The findings were statistically analyzed using chi-square and one-way ANOVA through SPSS version 24.* ***Results:*** *The overall prevalence of theileriosis in cattle was 12.23%. Cows exhibited a higher rate (5.62%) compared to goats (3.020%), sheep (0.420%), and buffaloes (0.590%). Female cows revealed a prevalence rate of 12.35% against 10.71% in male counterparts. Seasonally, theileriosis was more prevalent in the summer (19.79%), followed by rainy (14.58%), spring (8.33%), and winter (6.25%) seasons. Age-wise, animals under a year old were most susceptible (16.09%), compared to those aged 1-3 years (11.79%) and above 3 years (9.41%).* ***Conclusion:*** *Theileriosis shows a significant prevalence in Tehsil Paharpur, with a higher incidence in young and female cows, especially during the summer season. Molecular research is suggested for a deeper understanding of infection carriers, and proactive measures are needed for its mitigation.*

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INTRODUCTION

Pakistan has an estimated population of 207 million people and ranks fifth among the world's most populous nations. Agriculture and livestock are vital to the nation's food, economic, and job sectors. Annually, livestock accounts for 60.07 percent of the agricultural sector and 11.53 percent of the national GDP (Gross Domestic Product). It relates to a 1.505-billion-rupee increase in the national GDP with a 3.06% annual growth rate throughout the 2020-21 fiscal year. It is crucial to highlight here that 35% of the livelihood of the 10 Million households in Pakistan is closely associated with livestock and their products [1].

Bovine Theileria species are intracellular parasites that infect their hosts with both severe and mild illnesses. Infected buffalo exhibit fever (40.5–41.5 °C), dyspnea, anorexia, lymphadenitis (parotid, prefemoral, prescapular,), diarrhea, minor nasal, ocular discharges, pale mucous membrane, congested conjunctiva and hyper-salivation. In acute instances, theilerioisis is diagnosed upon clinical manifestations and microscopy of Giemsa stained smears. However, in long-term carriers, blood smears are negative under the microscope and disease can only be diagnosed using most advanced molecular techniques [2].

Therefore, this research was done for determining the prevalence of theileriosis in cows in Tehsil Paharpur, District Dera Ismail Khan.

MATERIALS AND METHODS

The current research was executed in Livestock Research and Development Station Paharpur, District Dera Ismail Khan of Khyber Pakhtunkhwa, Pakistan, for determining the frequency of theileriosis in cows. The investigation was conducted over one year (2021-22). For this purpose, 384 random blood samples were taken from cows of varying ages and sexes from various farms in Tehsil Paharpur [3]. The specimens were examined microscopically under an oil immersion lens to diagnose Theileria parasite [4]. Also the clinical-epidemiological details of the animals were collected.

The acquired findings were statistically examined using chi-square and one-way ANOVA through SPSS version 24.

RESULTS & DISCUSSION

Overall prevalence of theileriosis in cattle was found to be 12.23%, in Tehsil Paharpur of Dera Ismail Khan, whereby 47 cases were detected with Theileria through Giemsa stained thin blood smear techniques (Figure 1). A study reported that cows had the highest prevalence of theileriosis (5.62%), than goats (3.020%), sheep (0.420%) and buffaloes (0.590%). It was significantly higher in goats ($2 = 4.68$, $p<0.05$) and cows ($2 = 11.76$, $p<0.05$) [5]. Our findings were also supported by a study conducted in cow herds, whereby the relative prevalence of *T. annulata* was 12.8% and 23.3% by microscopy and PCR, respectively [6].

Most of the affected population comprised females revealing 12.35% (44/356) positive cases with Theileria, while a 10.71% prevalence rate was recorded in males (3/28) (Figure 2). Our findings were highly supported by a study in which it was reported that theileriosis was more common among female animals (3.56%) than among males (1.92%). There was a non-significant correlation between theileriosis prevalence and animal gender ($2 = 2.13$, $p > 0.05$) was observed. Female animals had a 1.89-fold greater prevalence (0.79–4.4) than male animals [5, 7].

Season-wise frequency of Theileria in cows was also recorded and a significantly high population of cows was affected with bovine theileriosis ($p<0.05$) in the summer season (19.79%), followed by rainy (14.58%), spring (8.33%) and the lowest incidence was recorded in winters (6.25%) (Figure 3).

Age-wise prevalence of theileriosis indicated that animals of age less than a year (16.09%) were more prone to the infection ($p<0.05$) than 1-3 years cows (11.79%) and above 3 years (9.41%) (Figure 4). Our findings were in agreement with the study stating that Theileriosis was more prevalent in cattle that were young and female animals [6]. Another study probed the prevalence of Bovine Tropical Theileriosis in cows. In the examined 300 cows, theileriosis was detected in 73 (24.33%) animals. The prevalence was higher among females (27.37%) than males (19.07%). The prevalence was also higher in adults than three years 28.33, followed by 21.33 in one to three years age group and 13.33% in 0-1 years. The Holstein Friesian cross showed the highest prevalence (30.53%) of tropical theileriosis, followed by the Jersey cross (25.33%), the Sahiwal (23.33%), and the Red Sindhi (15.71%) [8].

Figure 1: Overall prevalence of Theileria in cows

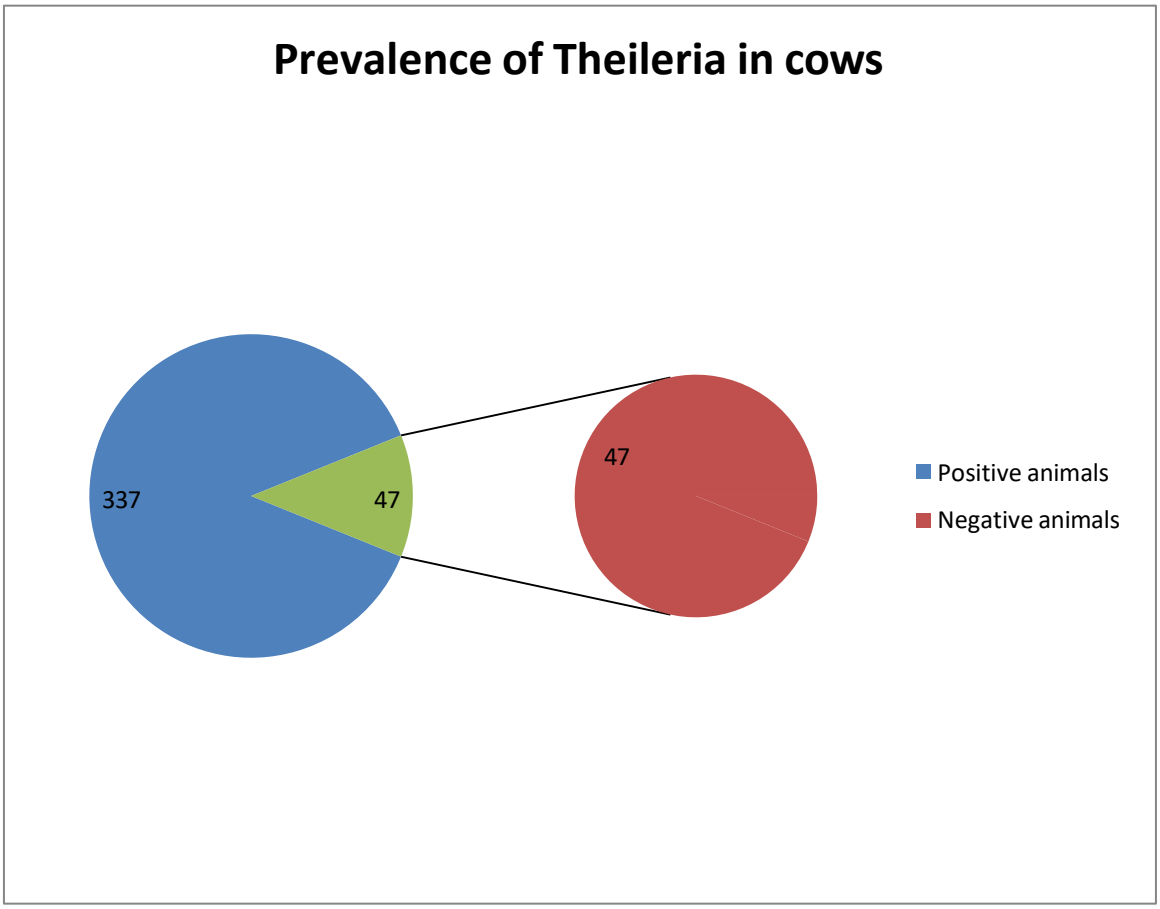


Figure 2: Sex-wise prevalence of Theileria in cows

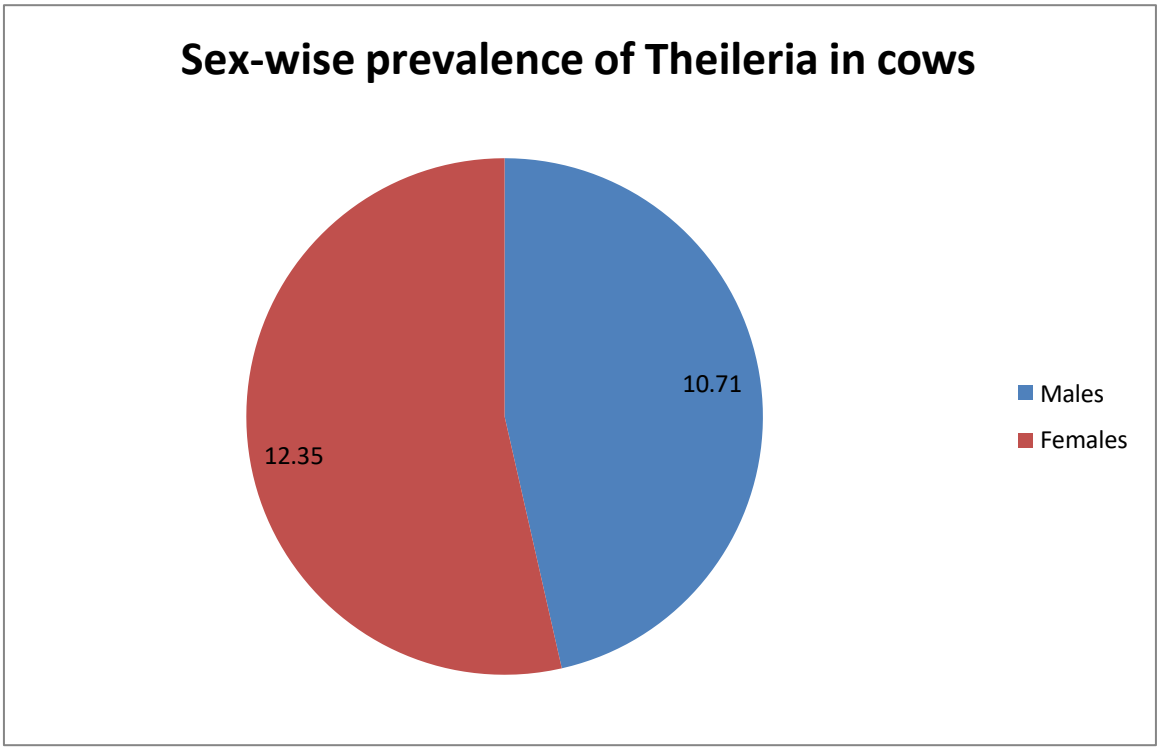


Figure 3: Season-wise prevalence of Theileria in cows

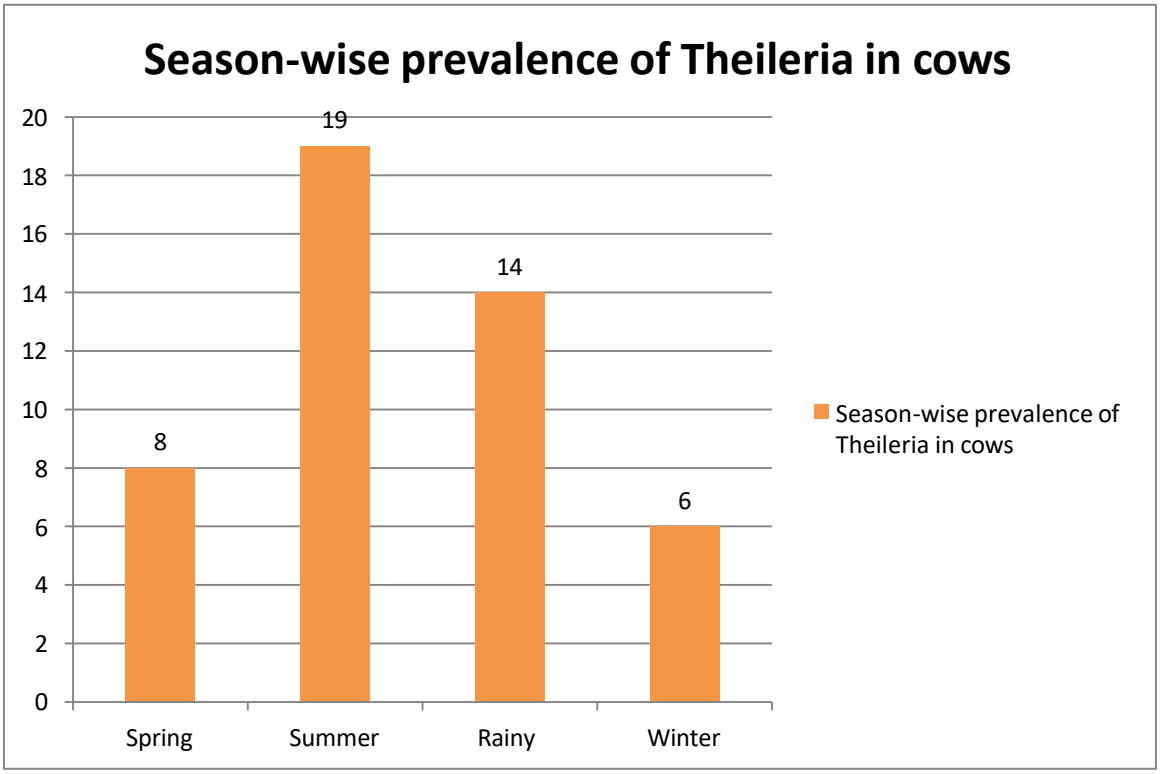
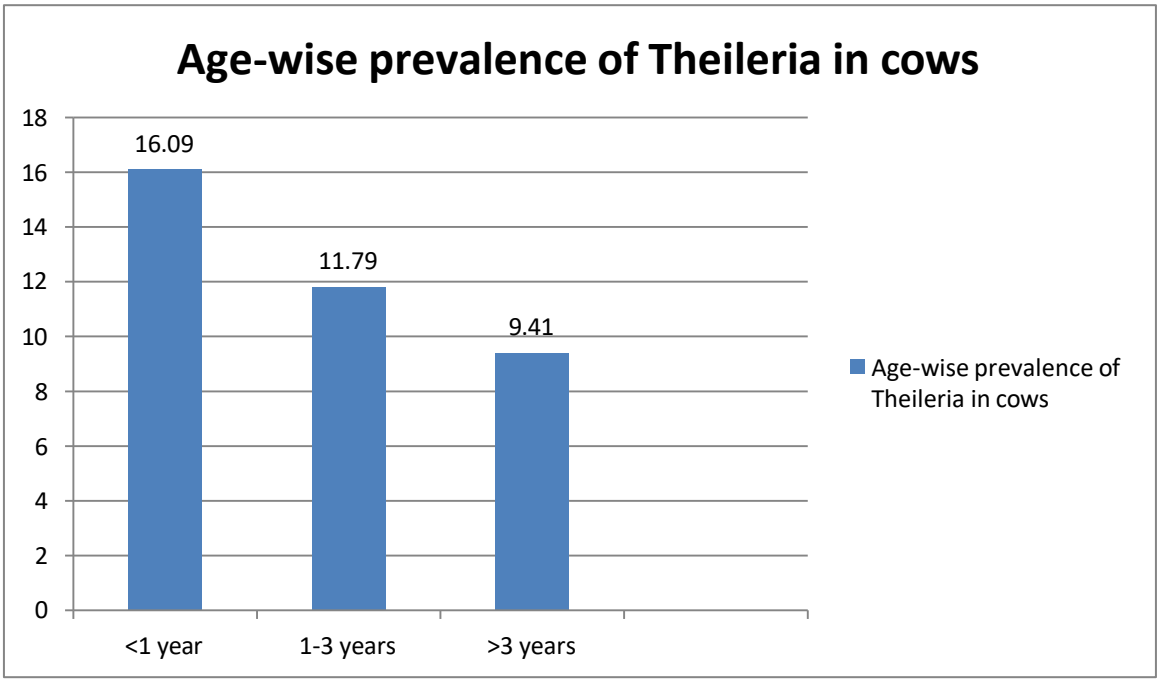


Figure 4: Age-wise prevalence of Theileria in cows



CONCLUSION

In Tehsil Paharpur, Dera Ismail Khan, Pakistan, theileriosis was determined to be quite widespread in cattle. There is a need for additional research using molecular techniques to identify the infection's carriers, and preventative measures must be implemented to eradicate the infection.

CONFLICT OF INTEREST

None.

LITERATURE CITED

1. Government of Pakistan, Finance Division. Economic Survey of Pakistan 2020-21. Pakistan.
2. Durrani AZ, Shakoori AR, Kamal N. Bionomics of Hyalomma ticks in three districts of Punjab, Pakistan. J Anim Plant Sci. 2008;18(1):17-23.
3. Thrusfield M. Modelling in Veterinary Epidemiology. 3rd ed. Oxford: Blackwell Science Ltd; 2007. p. 340-356.
4. Khan A, Ashfaq K, Din I, Haq R, Jamil M, Ullah B, et al. Bovine Theileriosis: Prevalence, Estimation of Hematological Profile and Chemotherapy in Cattle in Dera Ismail Khan, Khyber Pakhtunkhwa Province, Pakistan. Amer Sci Res J Engr Tech Sci. 2017;32(1):8-17.

5. Mohsin M, Hameed K, Kamal M, Ali A, Rafiq N, Usman T, et al. Prevalence and risk factors assessment of theileriosis in livestock of Malakand Division, Pakistan. J Saudi Society Agri Sci. 2022;21(4):242-247.
6. Ullah R, Shams S, Khan MA, Ayaz S, Akbar Nu, Din Qu. Epidemiology and molecular characterization of Theileria annulata in cattle from central Khyber Pakhtunkhwa, Pakistan. PLoS ONE. 2021;16(9):e0249417.
7. Khan A, Jamil M, Ali A, Ali A, Imdad S, Zeeshan M. Prevalence of Theileriosis in Buffaloes at Government and Private Farms in Tehsil Paharpur, Dera Ismail Khan. Int J Mod Agric. 2021;10:4360-4363.
8. Habib F, Tabassum R, Awais T, Sakhawat A, Khalil R, Sharif A, et al. Prevalence of Bovine Tropical Theileriosis in Cattle in Quetta Balochistan-Pakistan. Archives of Ani Husband Dairy Sci. 2021;2(3):1-3.