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# Prevalence assessment of Ectoparasite (Ticks) on Goats

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## Abstract

The rural economy is heavily reliant on goat farming as goats provide small and marginal farmers with meat, milk, and an opportunity to make a living. But farmers lose economically when goats have ectoparasitic infestations caused by ticks; they also lose the goats' health and productivity. This current study assessed the prevalence rate of tick infestation for goats in the Purvanchal region located in Uttar Pradesh India. Four hundred goats of various ages, breeds (breed), and sex were randomly assessed for tick populations based on a visual inspection (using a very detailed physical inspection) and ticks were collected after they were initially found by the visual assessment so they could be identified later using taxonomically standard taxonomic keys. Four-hundred goats were visually assessed (of which half —253 were found to have ticks), therefore resulting in an overall tick infestation rate of 63.25%. This study clearly indicates that tick infestations are a major problem across the entire survey area with a severe ectoparasitic burden on the all of the goats throughout the region and that goats with tick infestations that are in poor body condition eventually experience skin irritations and reduced productivity—therefore resulting in a higher-than-average chance of obtaining a secondary infection. An estimated economic loss due to decreased goat productivity experienced from ectoparasitic-tick infestations can reach thousands of dollars annually for a goat owners. The result of this finding emphasizes the importance of regular surveillance for ticks on goats and implementing strategic tick control programs, providing producers with improved hygiene on their farms, and raising awareness of producers about controlling ectoparasite infestations. Improved management practices will improve the health of goats

and the productivity of goats and therefore will ensure that goats can be farmed sustainably throughout the Purvanchal region.

**Keywords:** Goats, Ticks & Prevalence.

## 1.Introduction

Goats are a significant part of India's livestock sector and support the livelihoods of rural communities, mainly small and marginal farmers. Goats are often called the ‘poor-man's cow’ because they can adapt to different climates, are low-maintenance animals, and give meat, milk, skin, and manure. Goat farming provides not only food security but also additional income and jobs for rural areas.

Even though goats are economically important to the country, their productivity is limited due to a range of parasitic diseases; one of the biggest limitations regarding goat productivity is ticks. Ticks are blood-feeding ectoparasites that belong to the order Ixodida and can infect many species of animals, including humans, mammals, and birds (Purman & Loomis 1984). In addition to causing direct blood loss from the infected animal (tick), they can serve as vectors for different viral, bacterial, and protozoan pathogens to the goat which results in significant health and productivity losses in livestock. Ticks negatively impact animal welfare by inflicting skin inflammation, irritation, blood loss and anemia; decreasing body weight, milk production and reproductive efficiency; and ultimately devaluing livestock products. Considerable infestations of ticks affect the skin and hide as well, causing the leather quality to be diminished by approximately 20-30%, resulting in reduced commercial value. There have also been reports linking ectoparasitic infestations to alterations in both physiological and biochemical indices including hyperproteinaemia and impaired immune function (Gharbi et al. 2006; Taylor et al. 2007; Gwakisa et al. 2001).

A number of studies documenting the distribution and prevalence of ixodid ticks from different parts of India have been conducted over the years. Kumar et al. (2002) reported the number of ixodid ticks reported in Tamil Nadu, while Prakashan and Ramani (2003) studied the different species of ticks seen infesting humans in Kerala. Latha et al. (2004) conducted research on seasonal variation of tick infestations in small ruminants and determined that Haemaphysalis was the dominant tick genus in Tamil Nadu. Additional studies have been performed on goat tick infestations in southern India (Prakashan and Ramani 2007; Vathsala et al. 2008; Sundararajan et al. 2014). Other studies have been done before, in which ectoparasitism was also found to be a major constraint on production of small ruminants, in other South Asian countries. Ajith et al. (2017) analysed the prevalence of ectoparasites in goats belonging to different regions of India and the factors affecting prevalence rates.

According to FAO (2012), small ruminants play an important role in food security and poverty alleviation in developing countries. However, East Uttar Pradesh has large populations of goats and has climatic conditions which are conducive to the survival of ticks, but there is little information available related to the prevalence of ticks on goats in the

region. Continuous assessment of the tick population is necessary to develop effective strategies for managing the parasite and for minimising economic losses among livestock owners. Thus, this study was designed to determine the distribution of ticks in goats from the Mau and Ballia districts of East Uttar Pradesh. The ultimate objective of this investigation is to produce baseline epidemiological data that will help develop effective tick control programs, improve animal health management, and enhance production of goat farming activities in the study area.

## 2. Methodology/Study Area

The study area for this research was Mau and Ballia in eastern Uttar Pradesh, India, which has a tropical monsoon climate (i.e., hot, dry Summers; temperate Winters; high humidity during the rainy season), and the climate offers conditions conducive to growth and survival of ticks. Study Duration (Period) – The survey was performed over a one-year period between the dates of 1 January 2024 through 31 December 2024. This allowed several observations across all major seasons.

Animal Selection – One hundred (100) goats of different breeds, sex (male or female) and management systems were randomly selected from villages in the study area. The goats were then classified into two age groups for purpose of comparative analysis; that is, goats either below the age of three years or above the age of three years old.

Animal Examination – All of the goats selected for this study were examined, using an externals examination including the following body regions; head, neck, ears, belly, back, legs, tail, perineum, and vulva/scrotum; for presence of ticks. Tick collection was accomplished via the hand and brush techniques described by Hall (2016). All life stages of ticks were collected and/or examined (larvae, nymphs and/or adults) during the examination.

## 3. Results

Data are given in the following Tables

**Table 1:** Monthly variation in the Prevalence %

| Months | No. of Goats Examined | No. of Goats Infected | Prevalence % |
|---|---|---|---|
| January | 33 | 15 | 45.45 |
| February | 30 | 16 | 53.33 |
| March, | 35 | 20 | 57.15 |
| April | 34 | 21 | 61.76 |
| May | 42 | 31 | 73.80 |
| June | 35 | 27 | 77.14 |
| July | 33 | 22 | 66.66 |
| August | 32 | 20 | 62.50 |
| September | 28 | 22 | 78.57 |
| October | 30 | 19 | 63.33 |
| November | 33 | 18 | 54.54 |
| December | 35 | 22 | 62.85 |

| | | | |
|---|---|---|---|
| Total= | =400 | =253 | =63.09% |

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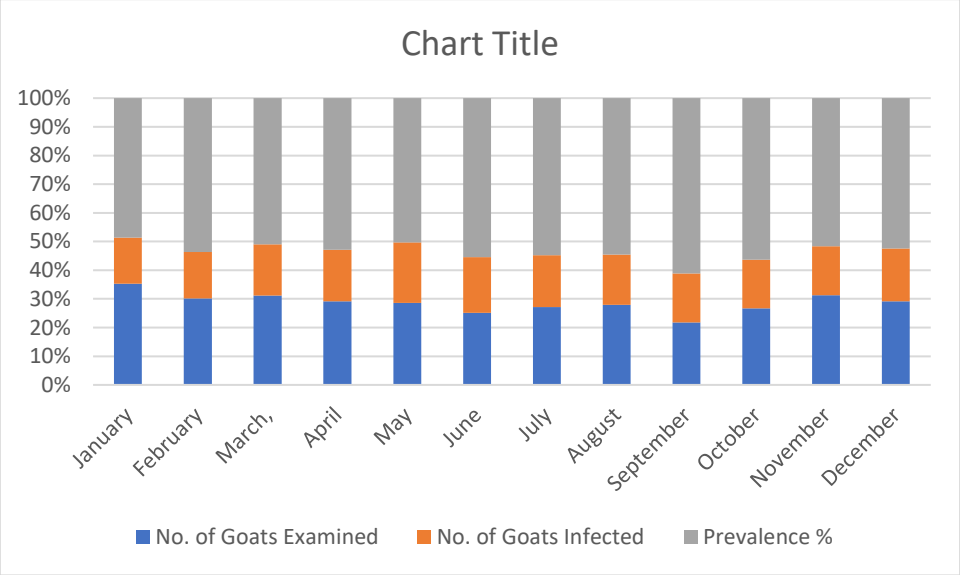
**Table 2:** Seasonal variation in the Prevalence %

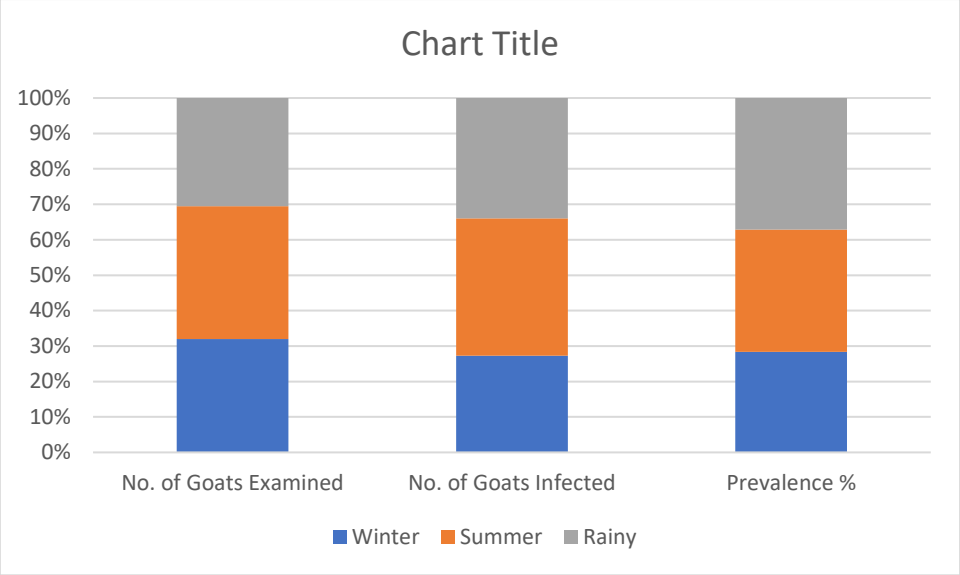
| Season | No. of Goats Examined | No. of Goats Infected | Prevalence % |
|---|---|---|---|
| Winter | 128 | 69 | 53.90 |
| Summer | 150 | 98 | 65.33 |
| Rainy | 122 | 86 | 70.49 |

**Table 3:** Prevalence % in two age groups

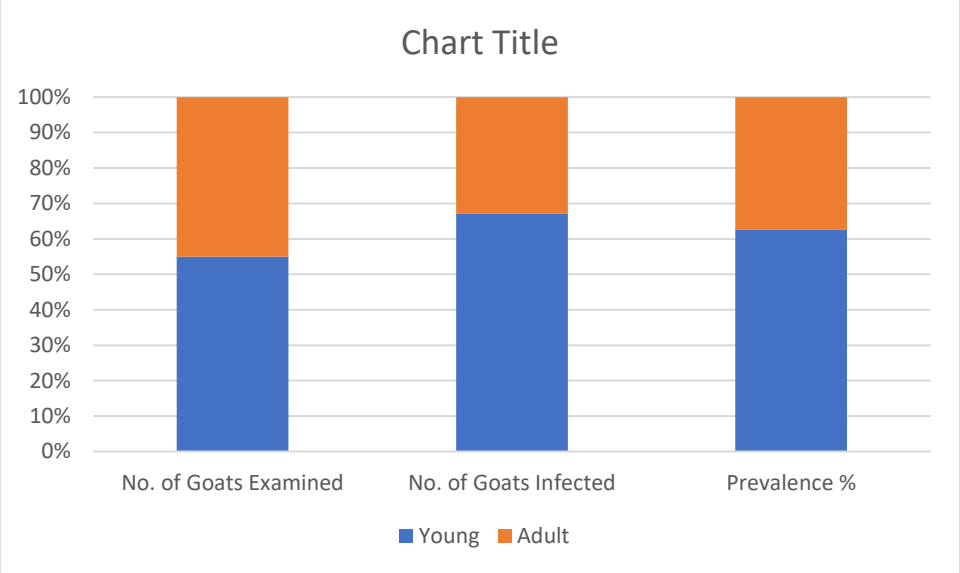
| Group | No. of Goats Examined | No. of Goats Infected | Prevalence % |
|---|---|---|---|
| Young | 220 | 170 | 77.27 |
| Adult | 180 | 83 | 46.11 |




Graph-Table No.1




Graph-Table No.2




Graph-Table No.3

**Monthly Variation in Tick Prevalence**

In total 400 goats were studied over a twelve-month period from January to December 2024; of these goats, 253 were found to have ticks. Thus, this equates to an overall prevalence rate of ticks of 63.25%.

The number of infested goats for each month of the study has been summarized in table 1 and illustrated in figure 1.

There was considerable fluctuation in the number of goats and their corresponding prevalence rates throughout the study in terms of tick infestations ranging from 45.45% (January) to 78.57% (September). There was steady growth in the prevalence rates (from March) such as if in April the prevalence was 73.80% (in May), and when the number was 77.14% (in June). However, the maximum number of infested goats was recorded at 78.57% between September and December; 66.66% in July; 63.33% in October; 62.50% in August, and lastly 62.85% in December respectively.

Seasonal differences are likely due to the fact that the warmer months have provided ideal living conditions for ticks and allow for the survival, development and reproduction of ticks. For example if the weather during the rainy season was particularly hot, humid or full of greenery, ticks would likely proliferate to a greater extent than usual.

The relatively low prevalence rates during the winter months of the year may suggest that there is less activity among ticks as well as lower rates of development because of lower temperatures. This view has been supported by other researchers e.g. Latha et al., 2004; Prakashan and Ramani, 2007; Sundararajan et al., 2014; and Ajith et al., 2017, who have stated similar seasonal profiles were recorded in relation to tick infestations in various parts of India following warm and humid seasons.

**Seasonal Variation in Tick Prevalence**

The seasonality of tick infestations (Table 2 and Figure 2) indicates that, of the three seasons, ticks were most prevalent during the rainy season (70.49%). The second-most prevalent season was summer (65.33%), while the least prevalent season was winter (53.90%).

Favorable soil moisture and temperature conditions present during the rainy season create an optimal environment for ticks to hatch larvae, survive as larvae, as well as seek out potential hosts. The moderate to high temperatures during summer are also suitable for tick reproduction; however, extremely dry conditions can lead to reduced survival of ticks in some habitats. The low temperatures and lack of activity due to low temperature of winter generally lead to lower levels of tick infestations.

The findings presented here are consistent with reports from other areas of India and South Asia that demonstrated increasing tick populations in relation to multiple favorable climate factors during the monsoon (Sarkar et al., 2010; Iqbal et al., 2014; Ajith et al., 2017).

**Age-wise Prevalence of Tick Infestation**

The age distribution analysis demonstrated statistically significant variance in susceptibility levels to tick infestations (table 3). Of the 220 young goats, 170 were found to have tick infestations resulting in a prevalence rate of 77.27%. In contrast only 83/180 adult goats were found to have ticks which means they had a prevalence of 46.11%. The much higher prevalence in young goats shows age is an important risk factor for developing tick infestations. The developing immune system of young goats is relatively immature and

therefore they are more susceptible to developing ectoparasite infestations than an adult goat would be. In addition to their developing immune system however, young goats also will not groom as effectively as an adult goat resulting in a longer timeframe for ticks to attach to the host animal. Adults may build some degree of resistance as a result of being exposed multiple times which helps to reduce their overall levels of infestation.

These findings are consistent with the results of previous studies showing that younger goats have a significantly higher level of ectoparasitic infestations than adult goats (Ajith et al., 2017; Iqbal et al., 2014).

**Overall Discussion**

According to the current study, a high incidence of tick infestation exists amongst goats in the Mau and Ballia districts of Eastern Uttar Pradesh where the overall prevalence was found to be 63.25%. Seasonality and goat age were then determined to be relevant predictors of tick infestation. The seasonal maximum was during the wet season; therefore, humidity and moderate temperatures would positively impact the life cycles and population dynamics of ticks. Young goats show greater incidence of infestation and highlight the role of host immune responses and management strategies in mitigating ectoparasitic infections. Loss of blood, irritation, skin lesions, decreased body weight gain, decreased milk production, decreased reproductive performance and a decrease in the condition of hides from tick infestations will have an adverse effect on livestock productivity. Furthermore, ticks will act as vectors for multiple bacterial, viral and protozoal pathogen transmission leading to disease transmission within the goat population; therefore the high incidence of tick infestations will result in significant economic losses for farmers in rural areas due to decreased production and increased costs associated with treatment and control This research reiterates the need for the implementation of integrated tick management programmes, including surveillance, strategic application of acaricides, rotational grazing systems, better sanitation and education programmes for farmers. All of these methods would greatly reduce the effects of tick infestation and therefore increase goat productivity and profitability.

## 4. Conclusion

This study has shown that tick infestations are a significant ectoparasitic parasite problem for, goats within Mau, Ballia Districts which are both located in Eastern U.P. With a prevalence rate of 63.25% reported\, it is evident that ticks are highly widespread in these areas & represent serious threats to the health\, performance\, and long-term economic viability/sustainable agricultural systems of smallholder farms. Furthermore\, it was observed that high infestations were experienced during rainy periods and young goat(s) suffered from higher levels of tick infestation compared to older goats. Therefore climate/environmental conditions play a role in determining how well hosts resist tick infestations. Directly, ticks result in lost profitability to farmers by: causing blood loss; inflicting damage to hides/skin; decreasing body weight; decreasing quantity/quality (volume) of meat/milk produced from infected animals; causing decreased quality of animal skins; etc. In addition\, many ticks serve as platforms for transporting bacteria, viruses, protozoans that could have negative effects on the health of livestock species. Therefore undesirable/ uncontrolled tick

infestations negatively affect the economy of smallholder goat farmers and threaten their ability to maintain/produce/develop their livelihoods. This research supports the urgent need to implement integrated management strategies for ticks, including routine surveillance of tick infestations, the strategic use of acaricides, improved sanitation of livestock housing, rotational grazing, regular monitoring of livestock health, and timely veterinary intervention. Equally important is the development of educational and awareness programs for farmers to help them quickly recognise and manage tick infestations. This study provides an important baseline for understanding the epidemiology of goat ticks from Eastern Uttar Pradesh and will contribute to understanding the dynamics of ectoparasites in small ruminants. The information can help veterinarians, livestock extension agents, and policymakers create region-specific programs for tick control that will improve animal welfare, increase livestock productivity, and improve the socio-economic conditions of rural farming communities. Future research should include molecular identification of tick species, pathogen surveillance, and assessment of acaricide resistance to develop sustainable and evidence-based tick control strategies over the long term.

## References

1. Ajith, Y., Dimri, U., Gopalakrishnan, A., & Singh, S. K. (2017). Prevalence and risk factors associated with ectoparasitic infestation in goats of different agro-climatic regions of India. *Journal of Parasitic Diseases, 41*(4), 1044–1049. https://doi.org/10.1007/s12639-017-0925-7
2. Devendra, C. (1996). Small ruminants in Asia: Contribution to food security, poverty alleviation and opportunities for productivity enhancement. *Proceedings of the 8th AAAP Animal Science Congress*, Tokyo, Japan.
3. Food and Agriculture Organization of the United Nations. (2012). *Livestock sector development for poverty reduction: An economic and policy perspective*. FAO. https://www.fao.org
4. Gharbi, M., Sassi, L., Dorchies, P., & Darghouth, M. A. (2006). Infection of small ruminants with tick-borne pathogens and their economic importance. *Veterinary Research Communications, 30*(8), 889–896.
5. Gwakisa, P. S., Yoshihara, K., Long To, T., Gotoh, H., Amano, F., & Momotani, E. (2001). Salivary gland extract of ticks suppresses cellular immune responses of the host. *Parasitology Research, 87*(6), 444–450. https://doi.org/10.1007/s004360100389
6. Hall, M. J. R. (2016). *Veterinary ectoparasites: Biology, pathology and control* (2nd ed.). Wiley-Blackwell.
7. Iqbal, A., Sajid, M. S., Khan, M. N., & Khan, M. K. (2014). Frequency distribution of ectoparasites in small ruminants under subtropical conditions. *Pakistan Veterinary Journal, 34*(4), 442–446.
8. Kumar, S., Karthikeyan, G., & Balakrishnan, N. (2002). Prevalence of ixodid ticks in livestock of Tamil Nadu. *Indian Veterinary Journal, 79*(8), 742–744.
9. Latha, B. R., Azhahianambi, P., & Leela, V. (2004). Seasonal activity of ixodid ticks on small ruminants in Tamil Nadu. *Indian Veterinary Journal, 81*(9), 1042–1044.

10. Prakashan, K., & Ramani, N. (2003). Human infesting ixodid ticks of Kerala, India. *Journal of Veterinary Parasitology, 17*(2), 133–136.
11. Prakashan, K., & Ramani, N. (2007). Incidence and prevalence of ixodid ticks on goats in South India. *Journal of Veterinary Parasitology, 21*(1), 45–49.
12. Purman, W. D., & Loomis, E. C. (1984). *The ixodid ticks (Acari: Ixodidae) of domestic animals*. University Press.
13. Sarkar, M., Rahman, S. A., & Sarker, B. K. (2010). Prevalence of ectoparasitic infestation in goats under rural management systems. *Bangladesh Journal of Veterinary Medicine, 8*(2), 121–126.
14. Soulsby, E. J. L. (2006). *Helminths, arthropods and protozoa of domesticated animals* (7th ed.). Baillière Tindall.
15. Sundararajan, A., D'Souza, P. E., & Jagannath, M. S. (2014). Epidemiological studies on tick infestation in goats of South India. *Journal of Veterinary Parasitology, 28*(2), 132–136.
16. Taylor, M. A., Coop, R. L., & Wall, R. L. (2007). *Veterinary parasitology* (3rd ed.). Blackwell Publishing.
17. Vathsala, M., Bindu, L., & Sreekumar, C. (2008). Epidemiology of ixodid tick infestation in goats of southern India. *Indian Journal of Animal Sciences, 78*(6), 593–596.
18. Walker, A. R., Bouattour, A., Camicas, J. L., Estrada-Peña, A., Horak, I. G., Latif, A. A., Pegram, R. G., & Preston, P. M. (2003). *Ticks of domestic animals in Africa: A guide to identification of species*. Bioscience Reports.