

Warming World, Changing Ticks: Are Livestock Diseases Moving into New Areas?

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Ticks are among the most important external parasites affecting livestock. They irritate animals, damage hides, contribute to blood loss and transmit pathogens responsible for diseases such as babesiosis, theileriosis and anaplasmosis. Their distribution is influenced by temperature, humidity, rainfall, vegetation, host availability and land use. As climatic conditions change, some tick populations may survive in places or seasons where they previously struggled to persist. However, climate change does not affect every tick species or disease in the same way. For farmers, veterinarians and wildlife professionals, the important question is how changing environmental conditions may alter the timing, location and intensity of tick-borne disease risks.



What does the research tell us?

A 2024 review published in Nature Reviews Microbiology examined how climate change and human activities influence vector-borne diseases. It explains that temperature, rainfall and humidity can affect the reproduction, survival and geographical distribution of vectors, including ticks. It also emphasizes that disease responses can be complex and sometimes ambiguous. A separate systematic review published in 2024 examined 84 studies on environmental influences on major tick-borne diseases in the United States. It identified climate, seasonal patterns and land use as important factors associated with disease distribution and epidemiology. These findings are informative, but they should not be interpreted as direct estimates of livestock disease prevalence in India. In India, a 2024 review in Pathogens examined hard ticks as vectors and discussed the roles of climatic factors in tick abundance, diversity and disease transmission. It provides a relevant starting point for understanding tick-related risks in Indian veterinary medicine.

How can changing weather affect ticks?

Several biological processes may be involved.

- Development: Temperature can influence the rate at which ticks progress through life stages, although the response differs among species.
- Survival: Very dry conditions, extreme heat and unsuitable microclimates may reduce survival, while favourable conditions may support persistence.
- Seasonality: Changing temperature and rainfall patterns may alter periods of tick activity.
- Host availability: Changes in grazing, wildlife movements and livestock management can affect the number of suitable hosts.
- Geographical distribution: Suitable habitats may expand in some locations and contract in others

These processes interact. A warmer season does not automatically mean that every tick species will become more abundant. Excessive heat or reduced humidity may be unfavourable for some ticks, and disease transmission also depends on whether the relevant pathogen and susceptible host are present.

Why is this important for livestock in India?

Indian livestock production includes cattle, buffaloes, sheep and goats raised under widely varying climatic and management conditions. Tick-borne diseases can reduce productivity through fever, anaemia, loss of body condition, reduced milk yield and reproductive problems. The implications may be especially important where animals graze outdoors, veterinary diagnostic facilities are distant, or acaricide use is not supported by systematic monitoring. In regions such as the Himalayas, local surveillance is particularly valuable because altitude, vegetation, seasonal temperature and livestock movement can create different conditions over relatively short distances. Nevertheless, local disease expansion should be demonstrated through repeated field observations rather than inferred from warming alone.

What should veterinarians and farmers monitor?

A practical surveillance programme should record:

- Tick species and infestation intensity on different host animals.
- Monthly or seasonal changes in tick abundance.
- Temperature, humidity and rainfall alongside tick observations.
- Laboratory confirmation of suspected tick-borne infections.
- Treatment history and evidence of possible acaricide resistance.
- Changes in disease occurrence across locations and altitudes.

These data can help identify high-risk seasons, improve treatment timing and distinguish a genuine geographical shift from changes in sampling or veterinary reporting. Integrated tick management may include regular inspection, appropriate acaricides, pasture management, quarantine and inspection of incoming animals, and vaccination where an effective vaccine is available for the relevant disease and setting.

Conclusion

Climate change is an important factor in the ecology of ticks and other disease vectors, but it is only one part of a larger picture involving hosts, land use, animal movement and pathogen biology. The strongest approach combines climate information with field surveillance, laboratory confirmation and responsible parasite control. Better local data will help veterinarians move from reacting to outbreaks towards anticipating seasonal risks and protecting livestock more effectively.

References

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