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Indian Livestock Parasite Burden: Control and Challenges

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Introduction

Parasitic diseases represent a substantial threat to livestock health and productivity across India, leading to significant economic losses and impacting animal welfare. These infections encompass a wide range of pathogens, including helminths, protozoa, and ectoparasites, which affect various livestock species. Understanding the prevalence, impact, and control of these diseases is crucial for the sustainability of the livestock sector. The economic ramifications are considerable, stemming from reduced growth rates, diminished milk and meat production, and increased mortality among affected animals. Integrated control strategies are paramount, often involving a combination of treatments and management practices [1].

Gastrointestinal nematodes are particularly prevalent in small ruminants such as sheep and goats, causing considerable morbidity and mortality. Molecular characterization of these nematodes provides valuable insights into population dynamics and the emergence of resistance to anthelmintic drugs. This information is vital for developing effective and targeted treatment protocols to combat these persistent infections [2].

Tick-borne diseases pose another significant challenge to cattle health in various regions of India. The epidemiology of these diseases, often caused by protozoan and bacterial pathogens transmitted by ticks, is complex. Identifying key tick species, their infestation patterns, and the co-occurrence of multiple pathogens is essential for designing robust tick control programs and mitigating disease spread [3].

The burden and spatial distribution of parasitic infections in small ruminants are influenced by a multitude of factors, including environmental conditions and livestock management practices. Studies that correlate parasitic prevalence with these factors can inform the development of localized intervention strategies, tailoring control measures to specific epidemiological profiles [4].

Tick-borne protozoan diseases, such as Theileriosis and Babesiosis, have a profound impact on the health and economic viability of livestock in India. An epidemiological review of these diseases highlights their distribution, impact, and the inherent challenges in their diagnosis and control. Effective surveillance and integrated pest management approaches are stressed as critical components of disease control [5].

Anthelmintic resistance in gastrointestinal nematodes of goats is a growing concern, threatening the efficacy of commonly used drugs. Assessing the prevalence of resistance and the efficacy of different anthelmintic treatments is vital for ensuring sustainable parasite control in small ruminant populations. Regular monitoring and responsible drug use are emphasized [6].

Ectoparasites, including lice and mites, inflict economic losses on indigenous cattle breeds through reduced productivity and compromised hide quality. Understanding their prevalence and infestation intensity across different agro-climatic zones is necessary for developing breed-specific management and control strategies to protect these valuable genetic resources [7].

Coccidiosis, caused by Eimeria species, is a significant parasitic disease in poultry, particularly affecting broiler chickens. Epidemiological investigations identify prevalent strains and assess the disease's impact on broiler performance, underscoring the need for enhanced hygiene and vaccination strategies for effective control [8].

Working equines, including horses, donkeys, and mules, are susceptible to a range of parasitic infections, both helminthic and ectoparasitic. These infections have serious implications for the health and welfare of these animals, which play a vital role in many rural economies. Integrated parasite management plans are recommended to address these issues [9].

Climate change presents a dynamic challenge to livestock health in India, influencing the distribution and prevalence of parasitic diseases. Alterations in temperature and rainfall patterns directly affect parasite life cycles and vector populations, leading to shifts in disease occurrence. Proactive adaptation strategies in veterinary public health are essential to address these evolving threats [10].

Description

The significant impact of parasitic diseases on livestock health and productivity in India cannot be overstated, with key prevalent parasites like Haemonchus contortus, Eimeria spp., and ticks contributing to substantial economic losses. These losses manifest as reduced growth rates, decreased milk and meat production, and increased mortality. The review highlights the challenges in diagnosis and emphasizes the necessity of integrated control strategies, including anthelmintic treatments and grazing management [1].

The molecular characterization and prevalence studies of gastrointestinal nematodes in sheep and goats in India are crucial for understanding parasite populations and their potential resistance to anthelmintics. By identifying dominant species and exploring genetic variations, these studies provide insights essential for developing targeted treatment protocols, thereby improving the health and productivity of small ruminants [2].

In the northeastern states of India, the epidemiology of tick-borne diseases in cattle is a major concern. Research identifying major tick species, their infestation patterns, and the co-occurrence of various protozoan and bacterial pathogens underscores the critical need for robust tick control programs to curb the spread of these economically devastating diseases [3].

Studies examining the burden and spatial distribution of parasitic infections in

small ruminants in rural India reveal the prevalence of helminthiasis and protozoal diseases. By correlating these infections with environmental factors and management practices, these investigations advocate for the implementation of localized intervention strategies grounded in sound epidemiological data [4].

The epidemiological review of Theileria and Babesia infections in Indian livestock provides a comprehensive understanding of these tick-borne protozoan diseases. It discusses their distribution, impact on animal health and the economy, and the inherent challenges in diagnosis and control, stressing the importance of surveillance and integrated pest management [5].

Assessing anthelmintic resistance in gastrointestinal nematodes of goats in North India is critical for sustainable parasite control. Studies on the efficacy of different anthelmintic drugs and observed resistance patterns highlight the need for continuous monitoring of drug effectiveness and the promotion of responsible drug usage to preserve treatment options [6].

Research on the prevalence and infestation intensity of ectoparasites, such as lice and mites, in indigenous cattle breeds across India reveals the economic losses incurred due to poor hide quality and reduced productivity. This work emphasizes the importance of adopting breed-specific management and control strategies tailored to the unique needs of different cattle breeds [7].

Epidemiological investigations into coccidiosis in broiler chickens in India have identified prevalent Eimeria species and assessed the disease's impact on broiler performance. The findings strongly recommend improvements in farm hygiene and the implementation of vaccination strategies as effective measures for controlling coccidiosis in poultry [8].

Studies on parasitic infections in working equines in India detail the prevalence of common helminths and ectoparasites, bringing attention to the health and welfare implications for these animals. These findings advocate for the development and implementation of integrated parasite management plans to safeguard the health of working equines [9].

The impact of climate change on parasitic diseases in Indian livestock is an emerging area of concern. Analysis of how changing temperature and rainfall patterns influence parasite life cycles and vectors highlights the need for proactive adaptation strategies in veterinary public health to mitigate the risks associated with shifting disease dynamics [10].

Conclusion

Parasitic diseases pose a significant economic and health challenge to Indian livestock. Studies highlight the prevalence of gastrointestinal nematodes in small ruminants, tick-borne diseases in cattle, and ectoparasitic infestations across various livestock species. Anthelmintic resistance is a growing concern, necessitating careful drug management. Climate change is identified as a factor influencing disease distribution. Effective control relies on integrated strategies, including diagnostics, targeted treatments, improved hygiene, and adapted management practices, especially for indigenous breeds and working equines. Poultry also face risks from coccidiosis. Addressing these multifaceted parasitic threats requires continued research and proactive public health interventions.

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Conflict of Interest

None.

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