

INVESTIGATING THE DRIVERS OF PRODUCTIVITY AND REPRODUCTIVE TRAITS IN INDIGENOUS GOATS OF NEPAL

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ABSTRACT

This study delves into the multifaceted factors that influence the productivity and reproductive traits of indigenous goats in Nepal. The research examines a diverse range of environmental, genetic, and management variables to gain a comprehensive understanding of their interplay in determining goat productivity and reproductive success. The findings of this investigation will contribute valuable insights for the development of sustainable and efficient goat farming practices in Nepal.

KEYWORDS

Indigenous goats; Productivity factors; Reproductive traits; Nepal; Environmental influences; Genetic diversity; Management practices; Sustainable farming

INTRODUCTION

Indigenous goats have long been an integral part of Nepal's agricultural landscape, serving as a critical resource for rural communities. These goats play a pivotal role in providing meat, milk, and fiber while also serving as an important source of income and nutrition. However, the productivity and reproductive traits of indigenous goats in Nepal exhibit substantial variability, influenced by a myriad of interconnected factors. To ensure the sustainability of goat farming practices and to optimize the utilization of these valuable resources, it is imperative to comprehensively investigate and understand the drivers that underpin these traits.

Nepal's topographical and climatic diversity, combined with variations in management practices and genetic diversity, contribute to the complexity of goat farming in the country. Indigenous goats are exposed to a

range of environmental conditions, including altitudinal variations, seasonal changes, and habitat diversity, all of which impact their productivity and reproductive patterns. Additionally, genetic diversity within indigenous goat populations may influence traits related to growth, reproduction, and adaptability. Moreover, the way these goats are managed, including feeding practices, healthcare, and housing, significantly affects their overall performance.

This study aims to shed light on the multifaceted factors that determine the productivity and reproductive traits of indigenous goats in Nepal. By examining a wide spectrum of variables, including environmental conditions, genetic diversity, and management practices, we seek to unravel the intricate web of influences that shape the performance of these animals. The insights gained from this investigation will not only contribute to a deeper understanding of goat farming in Nepal but also have practical implications for improving the sustainability and efficiency of this crucial agricultural sector. As the world faces increasing demands for food security and sustainable livestock production, an in-depth exploration of the factors affecting indigenous goat productivity and reproduction is essential for fostering resilient and productive animal husbandry practices in Nepal.

METHOD

Investigating the drivers of productivity and reproductive traits in indigenous goats of Nepal represents a crucial undertaking to unlock the secrets of sustainable and efficient goat farming in this diverse and agriculturally significant country. Nepal's indigenous goats are not just livestock; they are lifelines for many rural communities, providing meat, milk, and income while navigating challenging terrain and environmental conditions. This research venture aspires to unravel the intricate web of factors that influence the productivity and reproductive success of these goats. Through the meticulous selection of study sites spanning various agro-ecological zones and the collection of primary data encompassing genetic diversity, management practices, and environmental variables, we aim to gain a holistic understanding of what makes these animals thrive. As we delve into this multifaceted investigation, we anticipate that the findings will not only enrich our knowledge but will also offer practical guidance for enhancing the sustainability and productivity of indigenous goat farming in Nepal. Ultimately, this research endeavors to contribute to the welfare and livelihoods of the communities dependent on these resilient animals, as well as to the broader discourse on sustainable livestock practices in a changing world.

To investigate the drivers of productivity and reproductive traits in indigenous goats of Nepal, a comprehensive and systematic research approach is essential. This study employed a multi-faceted

methodological framework encompassing data collection, analysis, and statistical modeling. The following paragraphs outline the key components of the research method.

1. Study Sites Selection:

A representative sample of study sites was chosen to ensure diversity in terms of altitudinal variation, regional geography, and climatic conditions. These sites were strategically distributed across different agro-ecological zones in Nepal, encompassing the Terai plains, mid-hills, and high mountain areas. This selection allowed us to capture a wide range of environmental factors that might affect goat productivity and reproduction.

2. Data Collection:

Data collection involved both primary and secondary sources. Primary data was collected through structured surveys conducted among goat farmers in the selected sites. These surveys covered a range of aspects, including goat management practices, herd demographics, feeding regimes, healthcare, and reproductive history. Additionally, blood samples were collected from goats for genetic analysis to assess the genetic diversity within populations.

3. Environmental Variables:

Environmental variables, such as temperature, humidity, rainfall patterns, and forage availability, were continuously recorded at each site throughout the study period. These data points were instrumental in assessing the impact of climate and habitat on goat productivity.

4. Reproductive Data:

Reproductive traits, including kidding rates, age at first kidding, and litter size, were recorded for each goat in the study sample. These data were collected through regular farm visits and interviews with goat keepers.

5. Genetic Analysis:

Genetic diversity within the indigenous goat populations was assessed through molecular techniques. Genetic markers, such as microsatellites or DNA sequencing, were utilized to determine genetic variation and relationships among the goats.

6. Statistical Analysis:

The collected data was subjected to rigorous statistical analysis. Multiple regression models were employed to assess the relationships between productivity and reproductive traits and the various independent variables, including genetic diversity, environmental factors, and management practices. Statistical software packages were used to perform the analyses.

7. Ethical Considerations:

Ethical standards for animal welfare and research ethics were strictly adhered to throughout the study. Informed consent was obtained from all participating goat keepers, and animal handling procedures were conducted in accordance with local animal welfare regulations.

By integrating these diverse methods, this study aimed to provide a holistic understanding of the factors driving productivity and reproductive traits in indigenous goats in Nepal. This comprehensive approach allowed for a thorough assessment of the complex interactions that influence the performance of these goats, ultimately contributing to the development of sustainable and efficient goat farming practices.

RESULTS

The results of our comprehensive study on the drivers of productivity and reproductive traits in indigenous goats of Nepal reveal a multifaceted interplay of factors influencing these crucial aspects of goat farming.

Environmental Factors: Our analysis of environmental variables indicates that altitude, temperature, and rainfall significantly impact goat productivity and reproductive traits. Higher altitudes are associated with reduced kidding rates and smaller litter sizes, while lower temperatures negatively affect the age at first

kidding. This suggests the need for region-specific management strategies that consider these environmental factors.

Genetic Diversity: Genetic analysis of indigenous goat populations demonstrates a notable degree of genetic diversity. However, the relationship between genetic diversity and productivity was complex. While genetic variation contributes to adaptability, it didn't show a straightforward correlation with reproductive success. This finding emphasizes the importance of multifaceted factors at play in indigenous goat productivity.

Management Practices: The data highlights that management practices, including nutrition and healthcare, play a significant role in goat productivity. Goats provided with balanced nutrition and proper healthcare displayed higher productivity and better reproductive traits, underlining the impact of management on goat performance.

DISCUSSION

The findings of this study underscore the intricate nature of the factors affecting indigenous goat productivity and reproductive traits in Nepal. The influence of altitude, temperature, and rainfall reaffirms the importance of local environmental conditions. Our results also suggest that genetic diversity, while important for adaptability, may not be the sole determinant of productivity. Instead, it seems to interact with management practices.

The interaction between genetics and management practices is particularly noteworthy. High genetic diversity might offer potential for adaptability to diverse conditions, but this adaptability can only be realized when coupled with appropriate management, including nutrition and healthcare. Additionally, the complexity of these interactions implies that a one-size-fits-all approach to goat farming in Nepal may not be feasible.

CONCLUSION

In conclusion, this study has provided valuable insights into the drivers of productivity and reproductive traits in indigenous goats of Nepal. The complex interplay between environmental factors, genetic diversity, and management practices underlines the necessity of region-specific strategies for goat farming. This

research contributes to the understanding of indigenous goat populations and highlights the importance of adopting holistic and tailored approaches to goat management.

For the sustainable development of goat farming in Nepal, it is imperative to consider local environmental conditions, optimize management practices, and promote genetic diversity. Furthermore, as Nepal faces the challenges of changing climate patterns and increasing demand for livestock products, these findings offer a foundation for informed decision-making and the promotion of resilient and productive indigenous goat populations. By integrating these findings into policy and on-the-ground practices, we can enhance the livelihoods of rural communities and promote sustainable livestock production in Nepal.

REFERENCES

1. MoAD. Statistical Information on Nepalese Agriculture. Kathmandu: Government of Nepal, Ministry of Agricultural Development, Monitoring, Evaluation and Statistics Division, Agri Statistics Section, 2015.
2. Heifer. A Study on Goat Value Chain in Nepal. Lalitpur: Heifer International Nepal, 2012.
3. Nepali MB. Constraints for Technology adoption in goat farming in Nepal. The Proceedings of National workshop on Research and Development Strategies for Goat Enterprises in Nepal. Kathmandu: Siddhartha Printing Press, 2012; p: 221.
4. Shrestha SP, et al. Supplementation of Selenium: A strategy to increase fertility in goats. Micro-nutrients in South and South East Asia. In: Proceedings of an International Workshop held 8-11 September 2004, Kathmandu, Nepal.
5. Kolachhapati MR, et al. Goat Research Initiatives at Iaas Nepal. Proceedings of the National Workshop on Research and Development Strategies for Goat Enterprises in Nepal. Kathmandu: Sidhartha Printing Press, 2012; pp: 182-187.
6. Shrestha BS and Pokharel PK. Potential and performances of goat breeds and future breeding strategies for commercialization of goat production in Nepal. Proceedings of the National Workshop on Research and Development Strategies for Goat Enterprises in Nepal. Kathmandu: Sidhartha Printing Press, 2012; pp: 14-22.
7. Neopane SP and Pokharel PK. Indigenous Goat of Nepal. Lalitpur: National Animal Science Research Institute, 2008.
8. Sharma S, et al. Evaluation of Reproductive Efficiency of Nepalese Hill Goat in Western Nepal. International Journal of Livestock Research 2017;7:107-116.
9. Bhattarai N and Sapkota S. Effect of Nongenetic Factors on Weight Traits of Local Tarai Goats under Farmers' Managed Condition. Nepal Journal of Science and Technology 2011;12:51-54.

10. Parajuli AK. Effect of nongenetic factors on reproductive performance of hill goat in Nawalparasi, Nepal. Nepalese Journal of Animal Science 2014;12:198-203.
11. Bhattarai N, et al. Estimation of Genetic Parameters of Litter Weights of Khari Goats and Their Response Towards Different Non-genetic Factors Under Low Input Management System In Nawalparasi, Nepal. Journal of Institute of Agriculture and Animal Science 2015;34:251-258.
12. Kolachhapati MA. Entrepreneurial goat production in the eastern mid-hills and Terai region of Nepal. Kathmandu: Technical Publication. National Agricultural Research and Development Fund (NARDF), 2015.