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Popular Article

Challenges faced by the goat rearing enterprise in the Indian context

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Introduction

Goats, known scientifically as *Capra hircus*, hold a significant historical status as one of the earliest domesticated animals, originating in the Fertile Crescent approximately 10,000 years ago. They have played a crucial role in human economies, providing various resources such as milk, meat, hair, cashmere, and skins (Zeder and Hesse, 2000). India, being a mega-biodiversity hotspot, boasts a substantial livestock population, with the latest report estimating it at around 535.78 million. This population comprises 302.79 million cattle, 109.85 million buffalo, 74.26 million sheep, and 148.88 million goats, with goats alone constituting 27.74% of the total livestock. India currently recognizes 39 distinct goat breeds, each differing significantly in morphology and productivity traits. The contribution of goats has a significant impact in rural India. Goats are often the sole source of income for impoverished families and that is why they have rightfully been called "Poor Man's Cow." Goat rearing in India faces various challenges including disease management, feed scarcity, water shortages, predation, genetic improvement needs, marketing constraints, lack of education, land tenure issues, climate change impacts, and insufficient government support.

Challenges encountered in goat-rearing:

The Indian Goat industry's future prosperity hinges on its potential for profitability, influenced by a variety of challenges and opportunities. These challenges can be categorized into three main types: technical, commercial, and other. On the technical front, issues such as the lack of high genetic potential breeds, absence of productive exotic breeds for crossbreeding, inadequate scientific feeding practices, prevalent health challenges like PPR and CCPP, high kid mortality rates, and insufficient access to proper animal health services and medications pose significant hurdles. Meanwhile, commercial challenges encompass difficulties in marketing, the unorganized nature of the sector,

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endemic disease problems, risks associated with transboundary diseases, limitations in feed resources especially in grassland-based ruminant systems reliant on pasture grazing, gaps in feed supply chains particularly related to compound feed mixing and milling, and the need for institutional support to foster entrepreneurship (Gowane *et al*., 2019). Competition for resources presents various challenges within the Indian Goat industry. Firstly, in arid and semiarid regions, population growth is fragmenting rangelands, hindering pastoralists' access to traditional feed and water sources. Secondly, groundwater and freshwater depletion pose significant concerns, particularly as livestock numbers increase, further straining water supplies, especially for feed production. Climate change exacerbates these challenges, heightening production risks and potentially necessitating shifts toward more efficient production methods. Additionally, socio-cultural influences shape livestock systems, with livestock serving multiple roles in society, including food security, financial assets, and cultural significance. Ethical considerations, such as calls for global vegetarianism and concerns over livestock's environmental impact, may also drive change in production and consumption patterns. Furthermore, wildcard factors like the development of artificial meat and nanotechnology introduce uncertainty, potentially disrupting traditional livestock practices and necessitating thorough risk analysis and communication strategies.

Approaches for tackling the challenges

To achieve the goals outlined in the National Action Plan, a concerted effort must prioritize enhancing the goat-rearing sector across various dimensions. Firstly, emphasis should be placed on improving breeding and genetics to enhance the quality and productivity of sheep breeds. This involves the selection and breeding of high-performing animals to propagate desirable traits. Additionally, attention to nutrition is crucial, ensuring sheep receive balanced diets to support optimal growth, reproduction, and overall health. Health improvement and disease prevention measures are equally essential, necessitating proactive strategies such as vaccination programs, proper hygiene practices, and timely veterinary care to mitigate the impact of diseases. Furthermore, effective marketing strategies are vital to ensure that sheep farmers have access to profitable markets for their products, thus incentivizing investment in the sector (Dubeuf., 2021). Moreover, addressing farmer and animal welfare concerns is imperative, encompassing initiatives such as training programs for farmers, ensuring humane treatment of animals, and implementing sustainable practices. Additionally, enhancing research and development efforts, promoting technological innovation, and fostering collaboration among stakeholders are integral components of a comprehensive approach to addressing the challenges faced by the goat-rearing sector. By prioritizing these factors and implementing

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targeted interventions, the industry can progress towards achieving its objectives outlined in the National Action Plan.

Genetic and breeding aspects

To enhance both meat and milk production in Indian goats, breed improvement stands as a pivotal strategy. This involves implementing a comprehensive four-step Action Plan that focuses on identified breeds tailored for either meat or milk production. The first step entails the refinement of identified breeds through selective breeding, emphasizing animals within the same breed with superior genetic traits (Liang and Paengkoum, 2019). This process aims at cultivating pure lines with high genetic merit, thereby optimizing meat yield per animal. Subsequently, the second step involves crossbreeding lesser genetically merited breeds, such as the Marwari, with superior breeds like the Sirohi goat, fostering hybrid vigour and augmenting overall genetic quality. The third step extends this approach to non-descript breeds with even lower genetic merit, enhancing their genetic potential through crossbreeding with identified high-merit breeds. Finally, the fourth step introduces exotic germplasm with desirable genetic traits for both meat and milk production, enriching the genetic pool and further elevating productivity levels. Through these systematic breeding interventions, the Indian goat-rearing sector aims to significantly enhance both the quantity and quality of meat and milk yields per animal.

Enhancing goat nutrition

The understanding of farm animal nutritional requirements, encompassing energy, protein, minerals, and vitamins, has been well-established over time and further refined in recent years. In smallholder systems, inadequate nutrition stands out as a significant production limitation. Exploration of novel feed sources from various origins, including plantation crops and staples like maize, sorghum, millet, and groundnut, holds promise for offering alternative protein and energy sources (Tudu & Roy, 2015). Nevertheless, addressing nutritional constraints in extensive rangeland systems poses considerable challenges, particularly in developing regions. While enhancing livestock productivity in semi-arid and arid zones shows potential, the most viable solutions likely involve integrating existing knowledge rather than relying solely on new technologies. This necessitates effective information exchange between farmers and scientists. Moreover, as public health concerns regarding antibiotic usage in animal production continue to grow, encompassing microbiological hazards and food residue risks, it's imperative to raise awareness among farmers about the judicious use of antibiotics and vaccines, aligning with consumer demands for food safety and quality.

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Enhancing health and disease prevention

The occurrence of diseases results in significant economic losses due to compromised livestock health and decreased production. Progress in animal health is anticipated to be a key driver for the advancement of the livestock industry. Particularly during the transition from extensive to intensive and commercial management systems, disease control becomes paramount. The presence of infectious agents in the environment leads to a decline in both the quality and quantity of animal products. Effective strategic measures for controlling and eradicating economically significant diseases are essential for enhancing goat production nationwide. Diseases affecting goats can be categorized broadly as non-infectious and infectious (Gamit *et al.*, 2020). Disease prevention plays a crucial role in maximizing profitability on goat farms, with vaccination against infectious diseases forming a critical aspect of health management. Non-infectious diseases, responsible for approximately 80% of kid deaths, stem from factors such as starvation, nutritional deficiencies, environmental stressors, and reproductive issues. Meanwhile, infectious diseases like Blue Tongue, ET, and PPR often have short incubation periods, necessitating prompt antibiotic use to mitigate secondary infections, with vaccination being the primary control measure. Deficiency diseases, such as those related to calcium, glucose, phosphorus, vitamin D, and vitamin A, pose significant health risks to goats, with appropriate mineral and vitamin supplementation essential for prevention. In recent decades, India has witnessed a general reduction in livestock disease burdens, attributed to advancements in drugs, vaccines, diagnostic technologies, and veterinary services.

Promotion of the goat meat and milk processing industry

Goat meat and milk production and supply for local consumption is an overlooked sector within the country, often resulting in contamination from environmental pollutants when sold in open premises. Traditional production methods and unhygienic practices have tarnished the image of the Indian meat industry, highlighting the urgent need for a scientific and modernized approach. Establishing adequate market infrastructure is essential for effective marketing, especially considering the unorganized nature of the sector that hampers fair pricing for farmers (Morand Fehr *et al*., 2004). The absence of scientifically designed abattoirs and processing plants discourages farmers from adopting modern meat goat-rearing practices, limiting flock numbers. Ensuring quality assurance for goat meat and milk is imperative, alongside efforts to increase production and productivity, emphasizing the need for proper marketing facilities to compete in domestic and export markets. Additionally, processing and value addition to goat meat and milk products are essential for tapping into both domestic and export markets. Proposed measures include the establishment of state-of-the-

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art abattoirs cum meat processing plants, spreading awareness about acceptability of goat milk, raising prolific breeds of goats, implementing contractual farming for quality animal production, setting up cold storage facilities, and developing protocols for small-sized modern slaughterhouses.

Conclusion

Tackling the challenges faced by the goat-rearing sector in India requires a multifaceted approach that addresses various dimensions ranging from breeding and genetics to nutrition, health, marketing, welfare, research, and development. Prioritizing these aspects outlined in the National Action Plan can significantly enhance the quality and productivity of goat breeds, thereby fostering sustainable growth and economic prosperity for farmers. By implementing targeted interventions such as selective breeding, crossbreeding, nutrition management, disease prevention, marketing strategies, and welfare initiatives, the industry can overcome obstacles and achieve its objectives outlined in the action plan. Moreover, continued collaboration among stakeholders, technological innovation, and research advancements will be crucial in driving the sector forward and ensuring its long-term viability and success.

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