

International Journal of Agriculture Extension and Social Development

Volume 9; SP-Issue 7; July 2026; Page No. 33-36

Received: 02-05-2026
Accepted: 05-06-2026

Indexed Journal
Peer Reviewed Journal

Evaluation of feed resources and feeding practices of Gurezi cattle

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DOI: <https://www.doi.org/10.33545/26180723.2026.v9.i7Sa.3862>

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Abstract

The present study was conducted to evaluate feed resources and document the feeding practices followed by Gurezi cattle rearers in Gurez Valley of union territory of Jammu and Kashmir. It is part of a comprehensive research work done on the characterization of Gurezi cattle, a native cattle genetic resource of Kashmir valley, India. The research aimed to document the physical, morphometric, and production characteristics of Gurezi cattle, as well as study of management practices and socio-economic status of farmers in the region. A total of 600 animals and 210 farmers were surveyed for this study using a pre-structured questionnaire developed as per NBAGR guidelines. Information on feed resources, grazing management, concentrate supplementation, fodder conservation and seasonal feed availability was recorded and analyzed using descriptive statistics. The study revealed that natural alpine pastures constituted the major source of green fodder during summer, whereas stored hay, maize stover and other crop residues were the principal feed resources during winter. Stall feeding (100%) was predominantly practiced during prolonged snow-covered months, while free grazing was common during summer (83.33%). Limited use of concentrate feed (7.61%) and mineral supplementation (6.19%) was recorded from the respondents. Socio economic status revealed that Gurezi cattle is maintained by poor farmers of the Dardi Tribe with large family size of >9 members (71.42%) who lived in joint families (57.61%) mostly. Majority (54.76%) of the farmers were illiterate with a 70% having livestock rearing as their main occupation, had 1-4 Kannals of land most of which was non-irrigated. The annual household income was < 50 000 in (64.76%) respondents. Seasonal fodder scarcity, low-quality roughages and inadequate knowledge of balanced feeding were identified as major constraints affecting cattle productivity. The findings emphasize the need for scientific fodder production, improved feed conservation technologies and balanced nutritional management to enhance the productivity and conservation of Gurezi cattle in the High Himalayan ecosystem.

Keywords: Gurezi cattle, feed resources, feeding practices, Gurez Valley

Introduction

Indian economy is mainly based on agriculture and livestock where, livestock are a major source of livelihood security for small and marginal farmers. According to the 20th Livestock Census conducted in 2019, the total cattle population in the country amounts to 193.46 million ^[1], with 142.11 million being of indigenous origin (BAHFS, 2020) ^[2]. The economic interdependence of crop and livestock production in Indian agriculture is evident, with cattle serving as a fundamental cornerstone. Unfortunately, there is a concerning decline in the population of indigenous cattle, specifically *Bos indicus*, witnessing a decrease of 8.94% over the last decade, necessitating urgent scientific intervention for management.

Livestock plays a pivotal role in the livelihood security of rural households in the Himalayan region by providing milk, meat, manure, draught power, and a dependable source of income. In the remote high-altitude areas of Jammu and Kashmir, indigenous cattle are particularly important because of their ability to survive and produce under harsh climatic conditions, rugged terrain, and limited input systems. Among these, the Gurezi cattle represent a valuable indigenous genetic resource that has evolved

unique adaptive traits, including tolerance to cold stress, efficient utilization of low-quality roughages, and resilience to seasonal feed scarcity.

The Gurez Valley, situated in the northern Himalayas of Kashmir, experiences prolonged winters with heavy snowfall, restricting grazing opportunities for several months each year. Consequently, livestock production in the region largely depends on locally available feed resources such as alpine and natural pastures during summer, cultivated fodders, crop residues, tree leaves, and conserved hay during winter. The availability and quality of these feed resources vary considerably across seasons, directly influencing animal nutrition, productivity, reproductive performance, and overall herd health.

Although several studies have documented feeding systems of indigenous cattle in different parts of India, comprehensive information on feed resources and feeding practices of Gurezi cattle is scarce. Most available literature focuses on the characterization and conservation of indigenous cattle breeds, while limited attention has been paid to their nutritional management under the unique high-altitude production system of the Gurez Valley. Scientific documentation of the feeding practices followed by Gurezi

cattle rearers is necessary to identify nutritional constraints and formulate appropriate interventions for enhancing productivity of animals.

Materials and Methods

The study was carried out in Gurez valley of Bandipore district in union territory of Jammu and Kashmir located at a distance of around 130 km from Srinagar city. Gurez is situated in the far north at 34° 25' North latitude and 74° 38' East longitude across the famous Razdan Pass at an altitude of 11,672 ft above mean sea level. The Gurez valley extends over an area of 362.88 sq. km in the form of pastures, meadows, and forests accounting for more than 93% of the total geographical area. A field survey was conducted during the study period among Gurezi cattle rearing households. Information on major feed resources utilized by Gurezi cattle, grazing duration, stall feeding, feeding frequency, quantity of concentrate offered, use of mineral mixture and common salt etc was recorded, using a pre-tested and structured questionnaire developed as per NBAGR guidelines. The collected data were compiled and entered into Microsoft Excel and analyzed using appropriate statistical software.

Results and Discussion

The study revealed that Gurezi cattle are primarily maintained on natural alpine pastures during summer under an extensive grazing system, while hay and crop residues constitute the major feed resources during the prolonged winter season. Feeding practices are largely traditional, characterized by seasonal grazing, stall feeding during snow-bound periods, limited concentrate supplementation, and inadequate use of mineral mixture. The commonly available feed resources and feeding practices are described as follows:

Feed Resources

1. Natural Grazing Pastures- Alpine and sub-alpine meadows are the primary feed source during summer. Rich in natural grasses, legumes, and herbaceous species.

- Common species include:
 - a. Timothy grass (*Phleum pratense*)
 - b. Meadow fescue (*Festuca pratensis*)
 - c. Bluegrass (*Poa spp.*)
 - d. White clover (*Trifolium repens*)
 - e. Red clover (*Trifolium pratense*)

2. Cultivated Fodders

Farmers cultivate fodder crops on small landholdings:

- Oats (*Avena sativa*)
- Berseem (*Trifolium alexandrinum*)
- Maize fodder (*Zea mays*)
- Ryegrass (*Lolium spp.*)

3. Crop Residues

Used mainly during winter:

- Paddy straw
- Wheat straw
- Maize stover
- Pulse residues

4. Conserved Fodders

- Hay prepared from natural grasslands during summer.
- Stored and fed during snow-bound winter months.
- Silage preparation is generally limited or absent.

5. Tree Leaves and Shrubs

Supplementary feed sources:

- Willow (*Salix spp.*)
- Poplar (*Populus spp.*)
- Other locally available browse species.

Table 1: Major Feed Resources Utilized by Gurezi Cattle

Feed Resource Category	Feed Resources Available	Season of Availability	Relative Importance
Natural Pastures	Alpine grasses, legumes, herbs	Summer	Very High
Cultivated Fodders	Oats, berseem, maize fodder, ryegrass	Summer-Autumn	High
Crop Residues	Paddy straw, wheat straw, maize stover	Winter	High
Conserved Fodders	Hay from natural grasslands	Winter	Very High
Tree Fodders	Willow leaves, poplar leaves, browse species	Summer-Autumn	Medium
Concentrates	Wheat bran, rice bran, maize grain, oil cakes	Throughout year	Low-Medium

Table 2: Seasonal Feeding Practices Followed for Gurezi Cattle

Season	Feeding System	Major Feed Resources Used	Supplementation
Summer (May-October)	Free grazing	Natural pastures and meadows	Limited concentrates
Autumn (September-November)	Grazing + Stall Feeding	Pasture, crop residues, hay	Occasional concentrates
Winter (November-April)	Stall Feeding	Hay, crop residues, stored fodder	Concentrates for lactating cows
Spring (March-May)	Partial Grazing	Emerging pasture and hay	Limited supplementation

Table 3: Major Constraints in Feeding Gurezi Cattle

Constraint	Rank
Winter fodder shortage	I
Dependence on natural pastures	II
Limited fodder cultivation land	III
Lack of silage technology	IV
Inadequate mineral supplementation	V
High feed transportation cost	VI

Table 4: Feeding practices followed for Gurezi cattle

Parameter (Variable)	Percentage
Feeding pattern	
Stall feeding (during winter)	100
Semi-stall feeding	16.66
Grazing	83.33
Grazing season	
Summer grazing	100
Winter grazing	0
Feeding method adopted	
Individual	9.5
Group	90.47
Daily feeding frequency	
Once	95.23
Twice	4.76
Thrice	0
Pasture status	
Owned	0
Community	9.5
Government land	90.47
Roughage fed as	
Chaffed	0
Unchaffed	100
Practice of concentrate feeding	
Yes	7.61
No	92.38
Type of concentrate fed	
Home-made	85.71
Compound feed	14.28
Use of mineral mixture	
Yes	6.19
No	93.80
Types of supplements used	
Oil cakes	0
Cereal grains	100
Agro-industrial by-products	57.14
Concentrate mix	42.85
Adopted feed preservation method	
Hay	99
Silage	1
Feed/Fodder block	0
Others	0

The study revealed that during the summer season, animals are left for continuous grazing in meadows and community forests for 8-10 hours. Among the supplementary feeds, populus leaves happen to be the most common and abundant tree foliage fed to animals. These findings are in agreement with [3], who reported that in the Central Himalayas, nearly 66% of the fodder requirement is met by pasture and tree leaves.

During winter, due to very harsh climatic conditions that last for some 6 months from November to April when the temperature even falls as low as -15°C and land route remains completely closed, there is a severe scarcity of feed/fodder. These results are in accordance with the earlier findings of [4], who reported that the Indian livestock are mainly maintained on grazing with little or no access to mineral supplements. All these factors not only leads to deterioration of health and poor body score condition of livestock, but also lower productivity making livestock enterprise less remunerative for the owners. Very few farmers were practicing nutritional manipulation in feeding of their livestock which might probably be due to the lack of

knowledge. These results were in agreement with findings of [5], who studied, housing and feeding management practices of dairy animals in the tribal area of South Gujarat. Limited use of concentrate feed (7.61%) and mineral supplementation (6.19%) was reported from the respondents. Similar findings were reported by [6], who reported only 6.67% of farmers fed mineral mixture to their animals. However, provision of salt to the animals by the farmers in all the studied animals was in conformity with the findings of [7], who reported that urban dairy farmers in Hawassa city (Ethiopia) supplement their animals with common salt.

Conclusion

The study revealed that natural pastures constitute the major feed resource for Gurezi cattle during summer, whereas hay and stored fodders are the primary feed sources during winter. Feeding practices are largely traditional, with limited use of concentrate supplementation. Seasonal fodder scarcity, particularly during winter, remains the major constraint affecting cattle productivity.

Recommendations

Based on the findings of the present study, the following recommendations are proposed

1. Fodder cultivation should be promoted through the introduction of high-yielding, cold-tolerant fodder crops suitable for high-altitude conditions to reduce seasonal feed shortages.
2. Scientific fodder conservation practices, including hay and silage making during the summer months, should be encouraged to ensure adequate feed availability during the prolonged winter season.
3. Livestock rearers should be trained on balanced ration formulation, efficient utilization of locally available feed resources, and improved feeding practices through regular extension programmes.

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