



Poonchi: A Threatened Sheep Breed of Jammu and Kashmir, India

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This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Poonchi is a medium sized sheep distributed mainly in Poonch district of Union Territory of Jammu & Kashmir. Poonch is a remote district of Union Territory Jammu and Kashmir. The Gujjers and Bakarwal inhabiting Poonch and Rajori have developed excellence in sheep rearing practices since

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times immemorial. Topography of Poonch is hilly and mountainous forming many low lying beautiful valleys and this topography provides excellent space and grazing lands for excellent sheep rearing. The sheep farmers of Poonch district are economically backward, possessing average land holding of 3.95 kanal / farmer. Agriculture is core economic activity of sheep farmers of Poonch to meet household necessities. The Poonchi sheep are mostly white in colour. Although some black and spotted sheep are also common. The body length, chest girth and body height of adult Poonch ewes are 55.71 cm, 71.63 cm and 57.00 cm, respectively. The body weight of adult Poonch sheep varies from 28-38 kg (male) and 26-34 kg (female). Similarly, body weights of male and female hoggets range between 20-26 kg and 19-25 kg, respectively. Therefore, conservation initiatives are imperative to preserve this breed, requiring collaborative efforts from governmental agencies, local communities, and researchers. Strategies should focus on enhancing breeding programs, protecting natural habitats, and promoting the economic value of the Poonchi sheep's products.

Keywords: Conservation; Jammu & Kashmir; indigenous breeds; Poonchi sheep.

1. INTRODUCTION

Poonchi sheep is a small to medium in size [1] native sheep breed of Union Territory (UT) of Jammu & Kashmir. As name suggests the breeding tract of Poonchi sheep is Poonch district and adjacent areas of Rajouri district [2]. Poonchi sheep is locally known as Pahadi and Desi sheep [3,4] and mainly reared by nomadic communities [3,5] viz; Gujjars, Bakerwals and Pahadi for mutton and carpet wool production. This sheep population is migratory in nature [5-9]. The dominant coat colors are white, black and spotted. Indiscriminate crossbreeding with Rambouillet has been followed in the UT without regard to conservation of the indigenous breeds poses a serious threat to this unique sheep genetic resource and registered breed of nation [10-12].



Fig. 1. Poonchi sheep breed with black coat colour

1.1 Breeding Tract

Poonchi sheep breed is native to Poonch district [2] and adjacent areas of Rajouri district of Jammu province of UT of Jammu & Kashmir.

Poonch is a remote district [13] of UT Jammu and Kashmir, situated on LOC (Line of Control) between 33°25' to 34°01' N latitude and between 73°58' to 74°35' E longitude. It is surrounded by Baramulla, Budgam, Shopian and Kulgam Districts of Kashmir Valley in the North East, Rajouri district in the south and POK in the west. Topography of Poonch is hilly and mountainous [10]. These mountains are forming many low lying beautiful valleys. The elevation varies starting from 800 m at Balnoi to 4,750 m at Pir Panjal. The sky touching peaks roofed with shining snow and lush green pastures give a stunning scenery to Poonch. Pir Panjal range of mountains separates Poonch valley from Kashmir valley. Some important features of Poonch valley are summarized in Table 1. The Bakarwals of Poonch district alternate with the seasons between high and low altitudes mainly follow a migration route through the foothills of the Himalayas of Kashmir.

1.2 Climate of Poonch

The climate of Poonch is humid subtropical with short and pleasant summers. However, at some places like Mendhar, they may be irritating and hot [14]. The January is the coldest month in Poonch and rise in temperature is usually observed from mid March and maximum temperature is observed during the month of May. The winters are cool and rainy due to western disturbances and freezing nights are observed during January. Poonch observes an average rainfall of 1389 mm with 56 to 73 days annually. Maximum rain fall is observed during monsoon and March. January and February are the coldest months whereas May, June and July are hottest months with the variation of 20° to 40°C in average temperature.

Table 1. Some Important Features of Poonch Valley

| S.NO | Particular | Status |
|------|-------------------------------------|---|
| 1 | Headquarter | Town of Poonch |
| 2 | Tehsils | Balakote, Heveli, Mandi, Mankote, Mendhar, and Surankote |
| 3 | Blocks, villages and municipalities | 11, 178 and 2, respectively |
| 4 | Total area | 1674 Km ² |
| 5 | Elevation | 981 metres (3218 feet) |
| 6 | Total population | 476835 |
| 7 | Density | 280/Km ² |
| 8 | Urban | 8.1 |
| 9 | Sex ratio | 893/1000 (F/M) |
| 10 | Literarily | 66.74% |
| 11 | Languages (Spoken) | Gojri, Pahadi, Urdu, Kashmiri, Punjabi |
| 12 | Languages (Official) | English, Hindi and Urdu |
| 13 | Sheep Breeding Farm | Govt. Sheep Breeding Farm Balnoi (For production of elite Rambouillet germplasm for crossbreeding of native sheep of Jammu province) |
| 14 | Major highways | NH-144A |
| 15 | Forest cover | 26689.84 Hectare |
| 16 | Forest | 951sq.km |

1.3 Soil Types of Poonch

The mountainous topography of limits the development of soil. Therefore, mostly sub-mountainous and meadow soil are observed in Poonch with localized blocks of alluvial soil in some valleys near rivers. However, [15] also reported loamy type of soil in Poonch district of Jammu and Kashmir.

1.4 Agriculture in Poonch

Agriculture is core economic activity of sheep farmers of Poonch to meet household necessities. Mixed crop-livestock farming system is practiced in Poonch district. The farmers are small and marginal with average land holdings of 3.95 kanal / farmer. Maize (*Zea mays* as stable crop), paddy and wheat are most important cereal crops cultivated by farmers in Poonch. The favourable agro climatic conditions in Poonch district are ideally suited for cultivation pear, peach, apricot and plum. Walnut is also an important dry fruit of Poonch.

2. TRIBE RESPONSIBLE FOR REARING OF POONCHI SHEEP

The Poonchi sheep is mainly reared by Bakarwal tribe [3]. The Bakarwal is a nomadic tribe inhabiting in the Pir Panjal and Himalayan mountains of South Asia [16].

2.1 Socio-economic Status of Poonchi Sheep Farmers

They are mainly goatherds and shepherds called as Dhangar in rest of India [17,16]. They have developed perfect professionalism in Sheep & Goat rearing practice transhumance pastoralism [18,16], that involves cyclic movements from lowlands to highlands, to take advantage of seasonally available pastures at different elevations in Himalayas [19]. Further the tribe is socially, educationally, economically and politically backward.

Poonch district has the highest population of Gujjar (rearing cattle and buffalos) and Bakerwals (rearing sheep and goat). The sheep and goat farmers of Poonch district are uneducated economically backward [3], possessing average land holding of 3.95 kanal / farmer. Veering around socio-personal studies it is concluded that middle aged people, mostly illiterate with medium family education status and low social participation but high experience in livestock farming are engaged with sheep rearing [20].

2.2 Natural Vegetation of Poonch

The Poonch is bestowed with a wealthy plant diversity of enormous scientific and cultural significance [14]. The vegetation usually comprises narrow-leaved coniferous Chir pine

(*Pinus roxburghii* and *Pinus wallichiana*), evergreen shrubs, broad-leaved evergreen forests (*Buxus wallichiana*, *Ilex dipyrrena* etc.), broad-leaved deciduous forests (*Aesculus indica*, *Populus alba* etc.) and scrub forests, mixed together with plots of grasslands and agricultural crop fields of maize etc. [13].

2.3 Cultivated Fodder Crops

Fodder is more costly than the grain crop in the district. Hair grass (*Agrostis scabra*), Signal grass (*Brachiaria decumbens*), Bahia grass (*Paspalumnotatum Flügge*), Setaria grass: PSS-1 (Golden Timothi) (*Setaria anceps* Stapf.), Marvel grass (*Dichanthium annulatum*), Vetiver grass (*Chrysopogon zizanioides*), and Black vetiver grass (*Chrysopogon nigritanus*) are among fodder crops cultivated in Poonch [13].

2.4 Population of Poonchi Sheep

The population status of Poonchi breed is scanty with 2,643 sheep existing in 2013. The population of Poonchi sheep is decreasing constantly owing to the breeding policy of crossing sheep genetic resources of Jammu division with Rambouillet inheritance [21].

2.5 Livestock Species Reared by Farmers in Poonch

The livestock sector plays a significant role in the economy and welfare farmers of Poonch district. The livestock species reared by farmers in Poonch include Kagani goats [16] for meat and milk, Rambouillet sheep for mutton and wool, Buffalos for milk, cattle, Dasi Poonchi fowl, horses and Bakarwal dogs [13].

3. REARING SYSTEM, FEEDING, HOUSING AND MANAGEMENT OF POONCHI SHEEP

This sheep population is migratory in nature [3]. Poonchi sheep is raised on rich alpine pastures of Poonch and Kashmir valley. With the beginning of summers every year, the nomadic tribes of Poonch, Rajouri etc. along with sheep and other livestock species migrate to upper ranges of Himalayas through various mountain passes (Gallis and Dheras) to highland pastures of Kashmir Valley and highland pastures of Poonch associated with Kashmir. After the grazing season is over the nomads return back along with the livestock through same routes during autumn season. Poonch does not experience

snow fall except at some places therefore only night shelters are needed for livestock. During winters the livestock is managed using grazing during day and stall feeding during nights on dry fodders was prepared from wild grasses, straw of maize, wheat and mixed jungle hay, natural dry fodders, tree lopping, and pods of leguminous plants. The lambs are let for grazing with their dams after few days of confinement. As the mountainous area soils deficient in essential minerals like Sodium, Iodine, Phosphorous etc, therefore sheep are provided iodized salt to throughout year at regular intervals.

3.1 Strength of the Breeding Tract

The tribes rearing Poonchi sheep have developed excellence in rearing practices since times immemorial [18,16] along with hilly and mountainous topography forming many low lying beautiful valleys [14], therefore, providing excellent space and grazing lands for sheep rearing are among strengths of breeding tract of this breed. Further, foothills of the Himalayas and high lands of Kashmir provide excellent grazing grounds to the Bakarwals of Poonch district during summer. Also, the agro climatic, socio-cultural and soil type suitable for fodder development are among variables suitable for sheep rearing.

Contradictory to this limited or no access to veterinary care, lack of technology to improve pasturelands, fragile ecology and developing society are some discouraging variables for efficient livestock rearing. Crossbreeding of native sheep genetic resources and preference of farmers for crossbred sheep over native Poonch sheep owing to fast growth rate and general appearance of crossbreds are also discouraging factors for Poonchi sheep.

3.2 Morphology of Poonchi Breed

Poonchi is small to medium sized sheep [3]. Poonchi sheep like other all native sheep breeds of Jammu and Kashmir possess no distinct colour prototype [22]. The coat colour of Poonchi sheep is typically white [10] although some animals are black and black & brown spotted also. Head profile of Poonchi sheep is narrow and long with convex nasal bridge and flat forehead. Males have curved horns and mainly pointing backwards and outwards whereas ewes are mainly polled although some males are polled. The breed is characterized by short tail broad at the base and tapering towards end with



Fig. 2. Poonchi breed of sheep with white coat colour

average length of 12.63 ± 0.36 cm. Ears are medium sized and drooping. However, [1] has reported that this sheep possess short tail and short ears. Moreover, some sheep even possess rudimentary as well as tubular ears. The average ear length of this sheep is 10.15 ± 0.15 and legs are short, giving low-set confirmation to animals. Wattles are not common among individual animals. The body length, chest girth and body height of adult Poonch ewes are 55.71 ± 1.36 cm, 71.63 ± 2.36 cm and 57.00 ± 2.77 cm, respectively.

4. REPRODUCTIVE AND PRODUCTIVE PERFORMANCE OF POONCHI BREED

The males attain sexual maturity at 9 to 12 months whereas females attain sexual maturity at 12 to 15 months. The age at first lambing ranges from 18 months to 24 months where as inter lambing period ranges from 9 months to 12 months. Ewe produces on usually lamb per litter / year. However, twinning is rarely observed. The body weights of Poonchi sheep at different traits

are presented in Table 2. The body weight of adult Poonchi sheep varies from 28-38 kg (male) and 26-34 kg (female). Similarly, body weights of male and female hoggets range between 20-26 kg and 19-25 kg, respectively. Yadav et al. [2] reported the weight of the adult ram ranges from 35 to 40 kg and that of a ewe from 25 to 30 kg. Wool is of medium to fine quality, mostly white in colour. Sheep are shorn three times a year which produce between 0.9 to 1.3 gm greasy wool sheep per year. Fibre length ranges between 15 to 18 cm and the fibre diameter between 22 and 30μ .

4.1 Wool Yield and Quality Traits of Poonchi Sheep

The Poonchi sheep produces an average greasy fleece of 1.92 kg / year. The wool is coarse carpet type having fibre diameter of 27.93μ (21 to 34μ) and medullation of 6.10 % (1.33 to 9.98 %). The sheep are shorn twice a year, therefore, the staple length of wool fibers remain short of

Table 2. Body weight of different age groups of the poonchi sheep breed

| Age | Male body weight (kg) | Female body weight (kg) | Overall body weight (kg) |
|-----------|-----------------------|-------------------------|--------------------------|
| Birth | 2.10 ± 0.60 | 2.05 ± 0.65 | 2.08 ± 0.38 |
| 3 Months | 9.04 ± 0.75 | 7.02 ± 0.96 | 8.03 ± 0.69 |
| 12 Months | 21.09 ± 1.20 | 20.92 ± 1.20 | 21.01 ± 0.99 |

average length of 3.9 cm (1.4 to 5.6 cm). The crimps / cm varied between 2.50 to 6.50. However, [3] reported overall estimates of 8.67 ± 0.18 , 3.82 ± 0.07 cm, $63.14 \pm 0.23\%$, $24.99 \pm 0.13 \mu$, $2.22 \pm 0.19\%$ and 58.13 ± 0.17 nos for crimps per inch, staple length, clean wool yield, fibre diameter, medullation percentage, wool counts, respectively in Poonchi sheep.

4.2 Disease Prevalence and Husbandry Practices

The commonly found diseases are of viral (Sheep Pox, Contagious Ecthyma, Bluetongue) bacterial (Pneumonia, Enteritis, Diarrhea, Brucellosis, Foot Rot etc.) and parasitic origin, (Fascioliasis, Haemonchosis, Dicrocoeliasis, Dictyocaulus) and mange [22]. The health cover vaccination against sheep pox, FMD, enterotoxaemia, pulpy kidney and other diseases besides dosing of anthelmintics is done by District Sheep Husbandry Organization, Poonch regularly.

4.3 Utility of the Poonchi Sheep Breed

Poonchi sheep produce mutton and course wool with fibre diameter of 27.93μ (21 to 34μ). This sheep breed is reared for course wool and mutton. The slaughter age for males are 1 to 2 years whereas females are 7 to 8 years.

4.4 Breeding of the Poonchi Sheep

Random breeding and crossbreeding with Rambouillet sheep is breeding policy in vogue in Poonchi sheep for increasing overall growth rate for enhancing mutton production and quality wool yield per animal.

5. CONSTRAINTS AND THREAT OF POONCHI SHEEP FARMING

Crossbreeding with synthetic sheep breeds of Rambouillet and Merino inheritance is main threat which will result in loss of this breed. Further, small flocks scattered over large areas of fragile ecology which resulted in inbreeding depression and genetic drift. Lack of organized efforts for conservation and improvement of this breed also adds to the threats along with availability of alternate livelihood activities of farmers. Above all conservation of native sheep breeds not included in breeding policy in vogue of grazing areas and availability of alternate livelihood activities. Indiscriminate crossbreeding of Poonchi sheep with Rambouillet and/or Merino

sheep along with pasture degradation, shrinking of grazing areas and low production potential of Poonchi sheep are among important factors which constrain farming of this sheep [23]. Further, conservation of native genetic resources not included in breeding policy of UT of Jammu & Kashmir and increased demand for sheep product also adds to the constraints of farming of Poonchi sheep.

5.1 Risk Status of the Poonchi Sheep

Risk status is critical owing to its scanty population. Based on the level of crossbreeding, intermixing of flocks during migration to Kashmir valley at highland pastures and number of breeding rams of Rambouillet inheritance distributed by District Sheep Husbandry Organization, Poonch among all sheep rearing farmers for crossbreeding from over more than four decades the existence of this breed in near future seems questionable. Presently, more than 300 sheep of Rambouillet inheritance of District Sheep Husbandry Organization, Poonch distributed among farmers for crossbreeding.

5.2 Intervention Required

The Poonchi sheep needs to be conserved on the pattern of Gurez sheep under open nucleus breeding System (ONBS). This sheep should be characterized and studied for performance evaluation on priority basis and should be made self-sustainable through selection and breeding. The farmers maintain this sheep should be encouraged through incentive for keeping this valuable and registered sheep breed. The Govt. Sheep Breeding Farm (SBF), Balnoi, Poonch should be given dual mandate of producing elite Rambouillet rams for upgradation of sheep population already covered under crossbreeding and also conservation of Poonchi sheep. A good number of animals should be kept at institutional farms of SKUAST on pattern of Bakarwal, Karnah and Gurez sheep breeds. Education, incentives, subsidies on feed and fodders should be provided to the farmers for rearing the Poonchi sheep breed. Further, Agricultural Universities of UT of Jammu and Kashmir should act as nodal agencies to conserve of Poonchi sheep along with conservation of other livestock species [24].

6. CONCLUSION

The Poonchi sheep breed of Jammu and Kashmir, characterized by its resilience and

adaptability to the harsh mountainous environment, stands as a crucial genetic resource for the region. Despite its significance, the breed faces a perilous future due to various factors including crossbreeding, habitat loss, and inadequate conservation efforts. The decline of the Poonchi sheep threatens not only the biodiversity of the area but also the livelihood of local shepherd communities who rely on these animals for wool, meat, and milk. Conservation initiatives are imperative to preserve this breed, requiring collaborative efforts from governmental agencies, local communities, and researchers. Strategies should focus on enhancing breeding programs, protecting natural habitats, and promoting the economic value of the Poonchi sheep's products.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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