Research

Kow Debar: An Indigenous Black Sheep Population from the Hills of Uttarakhand

B. N. Shahi[1], D. Kumar[1], Sunil Kumar[1], A. K. Mishra[2] and Amod Kumar[2]

[1]*G B Pant University of Agriculture and Technology, Pantnagar-263145, Uttarakhand, India*
[2]*ICAR-National Bureau of Animal Genetic Resources, Karnal-132001, Haryana, India*

ABSTRACT

The study focused on the phenotypic characterization of Kow Debar sheep, a lesser-known sheep population from Uttarakhand, primarily found in Pauri Garhwal, Almora, and Chamoli districts at elevations of 1600–2200 meters above sea level. Data from 43 villages and 80 farmers revealed that Kow Debar sheep are small in size, black in colour, with compact body and coarse fiber coats. They have slightly convex heads, medium-sized horizontally oriented ears, and medium curved horns in males, while females are mostly hornless. Their husbandry involves an unorganized, semi-feral system, with sheep grazing 4–6 hours daily on local vegetation. Housing varies by flock size, and breeding is uncontrolled, primarily using flock-owned males.

Keywords: Black sheep, Kow Debar sheep, Phenotypic characterization

*Corresponding author: shahi_bn@yahoo.com

Received: July 17, 2025
Accepted: August 11, 2025

INTRODUCTION

The Uttarakhand region spans a total geographical area of 51,125 square kilometres. Forests dominate approximately 64% of this area, while mountains and hills cover 92%, leaving 8% as Tarai plains. India ranks second globally in sheep population, with 74.26 million sheep as per the 2019 census, showing a 14.1% rise. Uttarakhand, though smaller in share, had 7.91 lakh sheep, as per the Uttarakhand Sheep and Wool Development Board (Report, 2019). The Kow Debar sheep represent a valuable genetic resource native to the hilly regions of Uttarakhand and serve as an important source of livelihood for farmers from economically weaker sections. The Kow Debar is a lesser-known dual-purpose sheep breed, indigenous to Pauri Garhwal, Almora, and Chamoli districts. These sheep inhabit elevations ranging from approximately 1800 to 2200 meters above mean sea level. Physically, Kow Debar sheep are characterized by their small size, black coloration, and compact bodies cloaked in a coarse-fibered coat. By evaluating and characterizing the phenotypic traits and performance attributes of these unique sheep populations, our study aims to contribute to the sustainable management and conservation of India's invaluable ovine genetic resources.

MATERIAL AND METHODS

A comprehensive survey was conducted across three districts, namely Pauri Garhwal, Almora, and Chamoli of Uttarakhand, involving 43 villages and covering 80 farmers, resulting in the acquisition of 1088 data points concerning diverse age groups of sheep. Measurements were taken as per standard procedures provided by ICAR-National Bureau of Animal Genetic Resources, Karnal. Data on physical traits such as head profile, ear orientation, colour pattern, production performance, reproduction traits, and management practices were collected through personal observations and interviews using a predesigned questionnaire. The body biometric traits, including body length, height at withers, chest girth, paunch girth, and body weight, were measured.

RESULT AND DISCUSSION

The Kow Debar sheep (Kali bhaid, Dhibar) are primarily distributed across the hilly regions of Uttarakhand, including Thalisain in Pauri Garhwal (30.1503°N, 78.7863°E), Syaldey in Almora (29.8238°N, 79.2095°E), and Gairsain in Chamoli (30.0500°N, 79.2800°E**)**, situated at elevations ranging from approximately 1600 to 2200 meters above mean sea level. In the Garhwal and adjoining Kumaun region of Uttarakhand, the term "Kow" refers to the black colour, while "Debar" is used to denote sheep. Kow Debar sheep exhibit small size, black colour, and a compact body with a coarse fibre coat. Their heads are slightly convex, with a small length with medium forehead, tapering muzzle, alert eyes, and a black-colour nose (Fig. 1-4). The ears are medium-sized and horizontally oriented, while the horns are large, curved backward and downward, with flat ends in males and mostly absent in females. Wattles are absent. The presence of a black tongue is a prominent, distinctive feature of the breed (Shahi *et al.,* 2024; 2025).

Fig. 1: *Kow Debar Ram*

Fig. 2: *Kow Debar Ewe*

Fig. 3: *Kow Debar Lambs*

Fig. 4: *Kow Debar Flock*

Local farmers employ an unstructured, semi-feral husbandry system to rear these sheep. Grazing covers a distance of 2 to 4 kilometres daily for about six to eight hours, relying primarily on local grasses, harvested crop leaves, bushes, and lopped tree leaves for fodder. Regardless of season, this grazing routine persists, supplemented occasionally with concentrated feed. Offspring remain with their mothers, nursing and consuming grasses and tree leaves for up to three months before joining the flock for grazing. Breeding occurs naturally within the herds, with males constantly accompanying females. Owners generally exercise minimal control over mating, favouring larger flocks with more breeding males. Male offspring are selectively retained for breeding purposes, while surplus males are either disposed of or utilized for meat. Nearly all females are kept, with only older does sold for meat.

In adult Kow Debar males, the different body measurements (cm) for chest girth, body length, height at wither, and paunch girth averaged 72.15 ±0.80, 64.79 ±0.87, 59.56 ±0.77, and 73.09 ±0.68 cm, respectively (Table 1). Means estimates for adult females were 68.61±0.28, 61.77±0.31, 56.51±0.25, and 70.26±0.24 cm, respectively. Additionally, adult male body weight averaged 29.91±0.57 kg, while adult females averaged 26.20±0.20 kg (Table 2). Mishra *et al.*, 2016 reported higher body weight and biometry in adult Kajali sheep than our findings. Verma *et al.,* 2021 also studied the morphometric traits in Fatehpuri sheep. The dressing percentage was found to be higher in males (53.33%) compared to females (48.5%), indicating relatively better carcass yield in male sheep under similar rearing and slaughter conditions. The average greasy fleece weight per shearing was found to be 300 g**,** with a range between 250 to 350 g**.** This indicates moderate variability in fleece yield among the individuals evaluated. Shearing was carried out by the farmers twice a year.

Table 1: Average body measurements of adult Kow Debar sheep (cm)

Body measurement	Male			Female		
	Average	Range	N	Average	Range	N
Chest-girth	72.15±0.80	64.00-84.00	198	68.61±0.28	55.00-81.00	486
Body length	64.79±0.87	58.00-78.00	198	61.77±0.31	47.00-76.00	486
Height at withers	59.56±0.77	49.00- 65.00	198	56.51±0.25	45.00-67.00	486

Table 2: Average Body Weight of Kow Debar sheep (kg)

Weight at	Male			Female		
	Average	Range	N	Average	Range	N
Birth	2.57±0.49	1.50-3.50	20	2.41±0.31	1.50- 3.40	22
Weaning/ 3 months	9.67±0.29	9.00-12.00	14	9.52±0.27	8.00- 12.00	20
6 months	13.57±0.97	10.00-18.00	34	12.01±0.39	9.00-15.00	30
1 year	19.39±1.02	15.00-24.00	53	16.93±0.33	11.00-23.00	58
First Lambing	-	-	-	19.92±0.30	15.00-29.50	81
Adult weight	29.91±0.57	24.00-40.00	198	26.20±0.20	17.00- 37.00	486

The average age at sexual maturity in males was recorded as 12.5 months**,** with a range of 10 to 15 months based on observations from 72 individuals. Females exhibited their first estrus at an average age of 374 days**.** The estrus cycle duration averaged 18 days**,** ranging from 16 to 19 days**.** The average age at first mating in females was 13.5 months (range 12–15 months), while the average age at first lambing was 18.5 months, with a range of 17 to 20 months. The lambing interval was observed to be 9 months, varying between 8 and 11 months. Although the service period could not be precisely determined in this study, the gestation length averaged 152 days, with a range of 148 to 156 days. The average litter size was 1.00, and the average lifetime lamb production per ewe was 3.58, ranging from 3 to 4 lambs over their productive lifespan. Garole sheep of West Bengal shows early maturity first lambing at 10–12 months, short lambing interval (6–8 months), and high prolificacy 1.5–2.1 litter assize reported by Mandal *et al.,* 2008.

Ewes typically produce a limited quantity of milk, sufficient only to meet the basic nutritional needs of their lambs during the early stages of life. This low milk yield is primarily intended for direct suckling and is often not available in excess for collection or analysis. Due to the minimal quantity and direct consumption by the lambs, measuring this milk output accurately for scientific data collection is generally not feasible. The Kow Debar is a dual-purpose breed valued for both meat and coarse wool, with manure also being utilized by farmers as an additional resource. However, at present, these sheep are predominantly reared for meat, either for household consumption, commercial sale, or use as sacrificial animals during religious rituals. Marketing is primarily based on live animals, which are sold either upon reaching maturity or as per immediate need. The marketing system is relatively organized, with prices determined based on live body weight.

Several challenges plague sheep production in Uttarakhand, including insufficient green fodder year-round, inadequate knowledge regarding healthcare practices, a lack of market information, and unprofitable prices for their products. However, given the escalating demand for meat, there exists significant potential to leverage sheep rearing as a means of poverty reduction. To tap into this potential, focused sheep development programs must provide essential technical knowledge and accessible emergency veterinary services at farmers' convenience. Characterizing this breed allows for assessing their variability, a crucial step in formulating breeding strategies to enhance genetic traits and ensure sustainable utilization and conservation of this valuable sheep population.

The study has made notable progress in characterizing Kow Debar sheep, providing valuable insights into their physical traits, management practices, and utility. These findings contribute significantly to enhancing our comprehensive understanding of this native breed and guide future initiatives aimed at its conservation and improvement. These animals exhibit a high degree of morphological uniformity and possess distinct phenotypic traits that set them apart from recognized sheep breeds in the country. Additionally, their breeding tract is geographically isolated. In light of these factors, it is recommended that this unique sheep population be considered for official recognition and registration as a distinct Indian sheep breed**.**

ACKNOWLEDGEMENT

The authors express their gratitude to the Director, ICAR- National Bureau of Animal Genetic Resources, Karnal, for providing financial support under the Network project on AnGR and sincere gratitude to all sheep keepers for allowing measurements of their animals. We also sincerely thank the Director of Research, G B Pant University of Agriculture, Pantnagar, for providing all facilities to run the project efficiently and the Department of Animal Husbandry, Uttarakhand.

REFERENCE

Mandal A, Rout PK, Roy R, and Notter DR. 2008. Reproductive performance of Garole sheep under field conditions. *Small Ruminant Research*, 74: 134–138.

Mishra AK, Raja KN, Vohra V, et al. 2016. Phenotypic traits and performance of Kajali Sheep: a lesser known ovine genetic resource of Punjab, India*. Indian Journal of Animal Sciences,* 86: 1279–82.

Report. 2019. 20th Livestock Census-2019. All India Report, Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India.

Shahi BN, Kumar S, Kumar D, et al. 2024. Kow Debar: A lesser known sheep breed of Uttarakhand. *In:* National Symposium on Animal production systems and its role in sustainable use of AnGR & XXI Annual Convention of Society for Conservation of Domestic Animal Biodiversity (SOCDAB), held at Andhra Pradesh from 15-16, February, 2024.

Shahi BN, Kumar Sunil, Kumar D, et al. 2025. Phenotypic characterization of Kow-Debar (black sheep) breed of Uttarakhand: *In:* Technological Advancement and their application for management of Native Animal Genetic Resources (AnGR) and Annual Convention of Indian Society of Animal Genetics and Breeding (ISAGB), organized by SOCDAB held at Veterinary college, KVAFSU, Hebbal, Bengaluru, from January 21-22, 2025.

Verma MK, Singh VK, Singh J, and Verma AK. 2021. Evaluation of Body Weight and Body Measurements of Lesser-known Gang-Fatehpuri Sheep of Uttar Pradesh, India. *Indian Journal of Veterinary Science and Biotechnology,* 17: 80-82.