

Assam Hill Goats: Morphological and Anatomical traits

Jhuma Debbarma¹, J B Rajesh^{2*}, Bensia Debbarma¹,
Jashima Debbarma³, Roli B Jamatia⁴, Abhishek Paul⁵,
Zosangpuii⁶



¹PG Scholar, Department of Veterinary Anatomy and Histology, College of Veterinary Sciences and Animal Husbandry, Central Agricultural University (Imphal), Selesih, Aizawl, Mizoram: 796015

²Associate Professor, Department of Veterinary Medicine, College of Veterinary Sciences and Animal Husbandry, Central Agricultural University (Imphal), Selesih, Aizawl, Mizoram: 796015

³PhD Scholar, Department of Veterinary Medicine, College of Veterinary Sciences and Animal Husbandry, Central Agricultural University (Imphal), Selesih, Aizawl, Mizoram: 796015

⁴PG Scholar, Department of Livestock Production Management, College of Veterinary Sciences and Animal Husbandry, Central Agricultural University (Imphal), Selesih, Aizawl, Mizoram: 796015

⁵Assistant Professor, Department of Livestock Production Management, College of Veterinary Sciences and Animal Husbandry, Central Agricultural University (Imphal), Selesih, Aizawl, Mizoram: 796015

⁶Subject Matter Specialist, Livestock Production, Krishi Vigyan Kendra, Selesih, Aizawl, Mizoram: 796015

*Corresponding author: leovet@gmail.com

DOI:10.5281/Veterinarytoday.19239370

Abstract

The Assam Hill goat is an important indigenous goat of the North-Eastern Hill (NEH) region of India, particularly prevalent in Assam and adjoining hill states. Known for its adaptability, hardiness, and meat quality, this breed plays a significant socio-economic role among rural and tribal communities. The present article reviews the gross morphological characteristics and major anatomical features of the Assam Hill Goat, highlighting its adaptive traits to humid, high-rainfall, and hilly terrains. Emphasis is given to external conformation, coat characteristics, skeletal features, and selected visceral anatomical adaptations.

Keywords: Anatomy, Assam Hill goat, Morphology, Trait.

Introduction

Goats (*Capra hircus*) are one of the first animals domesticated by man and are primarily reared for their milk, meat, hide and manure. As they act as major source of income for the rural families so they are also called the 'Poor mens cow'. The 20th Livestock Census shows that India's livestock population has grown by 4.6%, over the previous census and reached 535.82 million. Globally India ranks second in goat population. Goats constitute about 27.8% of India's total livestock population (20th Livestock census, 2019). India is ranked second in the world for goat meat output and first for goat milk production (3%),

contributing around 14.47% of the total meat production of the country. The Assam Hill goat is a recognized indigenous goat breed of India, primarily distributed in the hilly tracts of Assam and neighbouring states of the North-Eastern region. It is well adapted to high humidity, heavy rainfall, and rugged terrain. The breed is primarily reared for meat production under low-input traditional management systems. Due to its resilience and disease resistance, it forms an integral component of smallholder farming systems. This breed is found in the Assamese districts of Dima Hasao, Morigaon, Golaghat, Dhemaji, Dibrugarh, KarbiAnglong, Nagaon, and Cachar. These goats can also be found in

Meghalaya's Ribhoi, East Jaintia Hills, West Khasi Hills, West Garo Hills, East Garo Hills, and West Jaintia Hills. This goat's local name is Asomi, and its accession number is INDIA_GOAT_0213_ASSAMHILL_06031. Assam hill goat is well adapted to the traditional open grazing zero input management system under varied range of topographic and climatic conditions of Assam.



Morphological Traits

- Asomi goats are typically white, occasionally exhibiting black patches on the backline and legs (Sarma *et al.*, 2025).
- They possess cylindrical, tapering horns that are usually straight, though some may have a slight backward curve; these horns are small, corrugated, and pointed at the tip (Sarma *et al.*, 2025).
- The goats are shortlegged with small body sizes, and both bucks and does are bearded.
- Their ears are medium-sized, horizontally placed, and have pointed tips, while their tails are short and hairy.
- The head is small to medium in size with a slightly convex forehead and a straight to mildly arch facial profile (NBAGR, 2019). The muzzle is medium-sized and well formed, and the eyes are bright and alert, reflecting active temperament (ICAR, 2013).
- The neck is short to medium in length and muscular, blending smoothly with the shoulders (ICAR, 2013). In males, a beard is commonly present as a secondary sexual characteristic (Chakrabarti *et al.*, 2013). The chest is moderately deep and broad, providing adequate thoracic capacity (NBAGR, 2019). The back is straight and strong, while the loin is firm and well developed (ICAR, 2013).

- The abdomen is moderately developed without excessive pendulousness, maintaining a balanced body profile. The udder in females is small to moderately developed with conical teats, reflecting its primary utility as a meat-type breed rather than a dairy type (NBAGR, 2019). The scrotum in males is well developed and symmetrical, indicative of normal reproductive morphology (ICAR, 2013).
- The limbs are straight, strong, and proportionate to body size, enabling efficient movement in hilly and forested regions (Khargharia *et al.*, 2015). The fore and hind limbs are well spaced, ensuring stability and balance (NBAGR, 2019). The hooves are hard, compact, and resistant to wear, which is advantageous under extensive grazing systems in rocky terrain (ICAR, 2013).
- On average, males and females have a height of 48.06 cm and 47.21 cm, body length of 57.63 cm and 54.98 cm, heart girth of 52.79 cm and 51.02 cm, body weight of 19.81 kg and 18.61 kg, and birth weights of 1.26 kg and 1.13 kg, respectively (Sarma *et al.*, 2025).
- The age at first parturition averages 13.34 months, with a range of 11 to 15 months, while the parturition interval is approximately 7.63 months, varying between 6 and 10 months.
- The milk yield per lactation averages 10.19 kg, with a fat percentage of 7.64%, and ranges between 7 to 22 kg of milk per lactation (Sarma *et al.*, 2025).
- The breed exhibits a dressing percentage of 46%, underscoring its suitability for meat production. In terms of performance, the breed demonstrates prolific reproductive traits, with an average litter size of 1.56 ranging from single births to quadruplets.
- The incidence rates of singletons, twins, triplets, and quadruplets are 51.17%, 41.92%, 6.69%, and 0.22%, respectively (ICAR-NBAGR, 2018).
- Twinning is a common occurrence in Assam Hill goats (Zeshmarani *et al.*, 2007).
- The average age at first heat in Asomi goat is 266 days (Kadirvel *et al.*, 2019).

Anatomical Traits

1. Skeletal System

- Anatomically, the skeletal system of the Assam Hill Goat is characterized by lightweight yet sturdy long bones that provide structural support without excessive body mass (ICAR, 2013). The scapular and pelvic girdles are particularly well developed, facilitating climbing ability, agility, and sure-footed movement on steep and uneven terrain (Sarma *et al.*, 2020).
- The skull is predominantly dolichocephalic, meaning it is relatively elongated in shape, which is a common characteristic of browsing goats adapted to selective feeding. The vertebral column is strong yet flexible, contributing significantly to balance and coordinated locomotion in hilly landscapes (Sarma *et al.*, 2020).
- These skeletal adaptations are consistent with goats reared under extensive grazing systems in mountainous environments and have been documented in breed descriptors maintained by NBAGR (2019).

2. Muscular System

- The muscular system is moderately developed, with comparatively well-defined shoulder and thigh musculature. These muscle groups support sustained browsing, climbing, and long-distance movement across rough terrain (ICAR, 2013).
- Carcass composition is typically lean, with minimal subcutaneous fat deposition, reflecting adaptation to fluctuating nutritional availability and low-input feeding systems. Unlike specialized meat breeds, muscle distribution in Assam Hill Goat favours agility and endurance rather than high carcass yield.
- This anatomical muscle pattern aligns closely with its ecological niche as a hardy hill-adapted breed.

3. Digestive System

- The digestive system follows the typical ruminant anatomical pattern, comprising the rumen, reticulum, omasum, and abomasum (ICAR, 2013). However, the rumen is particularly well developed, supporting efficient microbial fermentation

of coarse grasses, shrubs, and browse species commonly found in hill forests.

- The breed exhibits a strong browsing habit, enabling effective utilization of leaves, twigs, and agricultural by-products. Breed documentation by NBAGR (2019) highlights its adaptability to low-quality forage resources.
- This digestive efficiency allows sustained productivity even under conditions of fluctuating feed availability, a hallmark of hill production systems.

4. Respiratory System

- Anatomically, the respiratory system of the Assam Hill Goat is comparable to other domestic goats; however, it functions efficiently under the high humidity and varying altitudes characteristic of the NEH region (ICAR, 2013).
- Well-developed lungs and nasal passages facilitate adequate gaseous exchange even in moist environmental conditions. This structural competence contributes to physiological resilience and comparatively lower susceptibility to climatic stress than many exotic or intensively selected breeds (NBAGR, 2019).

Conclusion

The Assam Hill Goat, an important indigenous breed of the North-Eastern Hill region of India, particularly in Assam, exhibits distinctive morphological and anatomical adaptations that enable it to thrive under humid climate, heavy rainfall, and rugged hilly terrain. Its compact body size, strong limbs, hard hooves, and predominantly white coat support efficient mobility and environmental resilience, while its lightweight yet sturdy skeletal system, moderately developed endurance-oriented musculature, well-adapted rumen for coarse forage utilization, and efficient respiratory structure collectively enhance survival and productivity under low-input traditional management systems. With satisfactory reproductive performance, good dressing percentage, and socio-economic importance to rural and tribal communities, this breed represents a valuable indigenous genetic resource recognized by ICAR-NBAGR, warranting focused conservation and scientific improvement strategies to sustain its



unique adaptive potential and contribution to hill livestock farming.

References

- Zeshmarani, S., Dhara, K. C., Samanta, A. K., Samanta, R. and Majumder, S. C. (2007). Reproductive performance of goats in Eastern and North-Eastern India. *Livestock Research for Rural Development*, **19**(8): 114.
- Kadirvel, G., Singh, L. A., Rahman, M. and Singh, N. M. (2019). Farm animal genetic resources in agro ecosystem of North East India. *The Indian Journal of Animal Sciences*, **89**(11): 1175–1183.
- Khargharia, G., Kadirvel, G., Kumar, S., Doley, S., Bharti, P. K. and Das, M. (2015). Principal component analysis of morphological traits of Assam Hill goat in Eastern Himalayan India. *JAPS: Journal of Animal & Plant Sciences*, **25**(5).
- Sarma, O., Das, B., Phookan, A. and Gogoi, A. (2025). Animal Genetic Resources and Biodiversity in the North-Eastern State of Assam, India: An Overview. *Uttar Pradesh Journal of Zoology*, **46**(5): 140-152.
- ICAR-NBAGR. (2018). New breed registered. ICAR-National Bureau of Animal Genetic Resources (NBAGR), Karnal. <http://www.nbagr.res.in/registeredbreed.html>
- NBAGR (2019). *Breed Descriptor of Assam Hill Goat*. ICAR-NBAGR, Karnal, India.
- ICAR (2013). *Handbook of Animal Husbandry*. Indian Council of Agricultural Research, New Delhi.
- Sarma, L., Nahardeka, N., Aziz, A., Goswami, R.N., Zaman, G., Das, A. and Akhtar, F. (2020). Genetic and non-genetic factors affecting morphometric traits in Assam Hill Goat. *Indian Journal of Animal Research*, **54**(6): 761–767.