The present study was undertaken to observe morphometric and carcass characteristics of Jaunpuri goat. The survey plan was conducted in two districts viz. Allahabad and Jaunpur of its native tracts in Uttar Pradesh. The overall average body weights of male goats of the age groups 0-3, 3-6, 6-9, 9-12 and above 12 months were observed as 5.50±0.327, 12.07±0.598, 19.62±0.738, 21.92±0.571 and 30.44±0.978 kg respectively. The overall average body length of male goats of the age groups 0-3, 3-6, 6-9, 9-12, and above 12 months were observed as 38.63±1.762, 48.55±2.090, 58.77±0.652, 67.23±0.777 and 67.56±0.747 cm. The overall average height of male goats of the age groups 0-3, 3-6, 6-9, 9-12 and above 12 months were observed as 41.63±1.945, 53.36±2.094, 66.23±1.051, 72.69±0.664 and 72.31±0.893 cm, respectively. The corresponding values for females were 44.24±0.825, 50.38±0.836, 62.81±0.466, 69.14±0.387 and 69.00±0.691 cm. The mean value of horn size of male goats of the age groups 0-3, 3-6, 6-9, 9-12 and above 12 months were observed as 1.94±0.346, 2.73±0.449, 5.54±0.584, 5.85±0.696 and 7.56±0.381 cm respectively. The respective averages for females were 1.77±0.171, 2.60±0.173, 4.94±0.322, 6.53±0.424 and 6.79±0.421 cm. The results revealed no significant differences in average slaughter weight between the sexes of the same age groups but it varied significantly (P<0.05) in different age groups like 6, 9 and 12 month of age.

**Key words:** Carcass, Colour, Goats, Jaunpuri, Length, Morphometric traits, Weight.

**INTRODUCTION**

Goats were among the first farm animals to be domesticated. Goats have been recognized as the most effective livestock species for promoting health and economy of marginal and landless farmers in many developing countries (Patra, et al., 2002). Goats disseminated all over the world because of their great adaptability to varying environmental conditions and the different nutritional regimes under which they were evolved and subsequently maintained. In the developing countries, goats make a very valuable contribution, especially to the poor in the rural areas. The importance of this valuable genetic resource is underestimated and its extent of contribution to the livelihood of the poor is inadequately understood. They are often neglected in comparison with cattle and sheep. Goat provide dependable source of income to 40% of rural population belonging to below the poverty line in the country. It is the backbone of economy of small and landless farmer in India. Goat farming will be best suitable option among the livestock farming for up-liftment of the weaker section specially the landless and marginal farmer of economically backward region of India. Moreover, due to continuous urbanization, the goat will be the livestock species of choice in the future as it occupies less space and less feed and fodder.

The Jaunpuri breed of goat is dual purpose breed. They are generally black in colour with white patches, but in rare case dark brown colour are also seen. It is smaller than Jamunapari goat but larger than Barbari goat. Twining is very common. It is the best suited breed of the economically backward region of U.P. However, due to the lack of any scientific effort for its improvement, this breed remained neglected. A very serious situation may arise which may lead to degeneration of this important indigenous breed of goat of the country due to uncontrolled intermixing among the breed and absence of any planned strategies for conservation and geographical reorganization. Traditionally, any programme for the development of livestock has been directed mainly for increasing their production potential and overall economic value rather than to conserve and maintain their purity. Thus, knowledge regarding the geographical distribution, various production and reproduction traits and its management practice of this breed in its home tract are the pre-requisites for formulation any suitable strategies for its genetic improvement. Finally, it would be of tremendous importance in deciding its conservation strategies as well as the preparation of the data base for this improvement indigenous goat breed. Keeping in view of above facts, the
present study was taken up to study the morphometric and carcass characteristic of Jaunpuri goat.

MATERIALS AND METHODS

Breeding tracts of Jaunpuri goats: The Jaunpuri goats breed found in the eastern part of U.P. state of India. They are generally found in the district of Allahabad, Ambedkernagar, Azamgarh, Bhadahi, Faizabad, Gazipur, Jaunpur, Mau, Mirzapur, Sonbhadra, Sultanpur and Varanasi particularly in the belt between Ganga and Gomati rivers of eastern U.P.

Survey plan and selection of study area: The survey plan was conducted in two districts of Eastern U. P. viz., Allahabad and Jaunpur of its native tracts. Ten villages from Jaunpur and fifteen villages from Allahabad district had been randomly selected for the present investigation. Twenty one farmers and one hundred thirty goats from Jaunpur and twenty two farmers and one hundred thirty four goats from Allahabad districts were selected for investigation.

Data collection: The questionnaire developed by the Department of Animal Genetics and Breeding, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad was used for collection of the required information. A total of 264 goats, comprising 61 males and 203 females were used for the morphometric traits. The animals were divided in five age groups. Group A (0-3) months consisted of 8 male and 37 female; Group B (3-6) months consist of 11 males and 50 females; Group C (6-9 months) comprising 13 males and 47 females, Group D (9-12months ) having 13 males and 35 females and Group E above 12 month consisted of 16 males and 34 females in both the district. Measurements were taken early in the morning to avoid the effect of feeding and watering on the animal’s size and conformation. The measurements of all 264 goats were obtained for the body weight (BW), body length (BL), height-at–withers (HAW) and chest girth (CG) were measured.

The picture showing the measurement of height at Wither (HAW), Body Length (BL) and Chest Girth (CG)

Means ± SE for the body weight and linear body measurements were calculated using Minitab Statistical software programme. The pattern and type of coat colour, shape and orientation of the horns and ears, size of tail, and profile of head were recorded using coded descriptors.

RESULTS AND DISCUSSION

Morphometric character of Jaunpuri goat in field condition

Coat colour: In present investigation, the overall percentage of coat colour with black, brown, white, black with white spot, brown with white spot, white with black spot were observed as 34.78, 11.23,5.07, 40.94, 5.80, and 2.17 %, respectively. The findings revealed that black with white spot was in higher proportion than other colour types in both the districts. It was observed from the present findings that the most common colour of Jaunpuri breed of goat was black with white spots (patch), followed by black and brown colour varieties. Black Bengal goats have different coat color variation i.e. black, brown, and white and any combination of those colors at any proportion (Nozawa and Katsumata, 1984).

Skin colour: In the present finding, three types of skin colour were noticed in Jaunpuri goats. The overall percentage of these three types viz., black, white and brown were observed as 68.12, 14.12 and 17.40 %, respectively. The findings revealed that the proportion of black was highest in both the districts of Jaunpur (69.34) and Allahabad (66.90). The lowest proportion was of brown colour in Jaunpur (14.60) and Allahabad (12.90) district, respectively.

Muzzle colour: The four types of muzzle colour i.e. black, brown, brownish black and white in Jaunpuri goat were observed in the present investigation. The overall percentages of these respective colours were 82.61, 10.87, 5.80 and 0.73%. The results further revealed that the most common muzzle colour was black in both the districts. However, the proportion of white muzzle was almost negligible (1.46% in Jaunpur and 0.00% in Allahabad district).
Hoop colour: In the present study, three types of hoop colours were recorded for Jaunpuri goat in its home tract. The overall percentages of black, brown, and white hoop colour were observed as 81.16, 12.68 and 5.43%, respectively. Similar trends in their proportions were noticed in both the districts. The finding further revealed that the Jaunpuri breed of goat has, in generally, black colour hoop.

Eye lid colour: Three types of colour of the eye lid (black, brown and white) were found in Jaunpuri goat. Their respective overall percentages were recorded as 87.16, 12.68 and 0.36, respectively. The finding revealed that the proportion of black was significantly higher than brown in both the districts. The white colour was negligible (0.00% in Allahabad and 0.73% in Jaunpur) in both districts. Thus, in the present study, the most common body colour observed in Jaunpuri breed of goat in the field condition was black with white spots (patch) coat colour and black colour skin, muzzle and hoof.

Horn, ear and head characteristic of Jaunpuri goat

Horn: Present/Absent: The overall percentage of present, absent and bud horn were observed as 93.11, 3.62 and 3.26 %, respectively. The findings revealed that in both the district, the horned condition were observed in maximum proportion, thus, indicating that the Jaunpuri goats are of horned type’s breed of goat.

Horn colour: The overall percentage of black, brown, and spotted brown horn colour was 85.60, 8.17, and 6.23 % respectively. In both the districts, most of the goats fall in black horn groups revealing that the most common horn colour of this breed of goat is black.

Horn shape: The overall percentage of, curved, straight and twisted horn was 22.56, 64.60 and 12.84 %, respectively. The finding revealed that in Jaunpur and Allahabad districts, the proportion of straight shape horn was highest (63.36 and 65.87%) while, the lowest was for twisted (12.98 and 12.67%). Normal Deviate test revealed that the two differed significantly only in straight and curved horn shape; the findings suggested that the most common horn shape of Jaunpur goats is straight.

Horn orientation: The overall percentage of lateral pointed tip, upward pointed tip and backward pointed tip horn was 67.36, 16.25 and 18.24 %, respectively. The findings revealed that in both the district, the proportion of backward pointed tip horn was highest, indicating that the most common horn orientation was of backward pointed tip in Jaunpuri goats.

Ear orientation: The overall percentage of twisted, upward, pendulous and horizontal ear was 1.09, 0.36, 85.51 and 13.04 % respectively. The findings revealed that in both the district, the proportion of pendulous ear was highest revealing that the most common ear orientation was of pendulous type in Jaunpuri goats.

Forehead: The overall percentage of straight, convex, and concave forehead was 6.88, 86.96 and 6.10 % respectively. The findings revealed that in both the district, the proportion of convex head profile was highest, indicating that the most common head profile was of convex type in Jaunpuri goats.

Wattle present/absent: The overall percentage of absent and present wattle were observed as 89.40, and 10.14 % respectively. The findings revealed that in both the district, the non wattle type of goat were found in maximum proportion, indicating that the Jaunpuri goats are of non wattle type’s breed of goat.

Beard present / absent: The overall percentages of absent and present beard was observed as 91.30 and 8.70 % respectively. The findings revealed that in both the district, the non beard type of goat were observed in maximum proportion, thus, indicating that the Jaunpuri goats are of non beard type’s breed of goat.

Body weights: In all cases male body weight were higher than female. The overall average body weights of male goats of the age groups 0-3, 3-6, 6-9, 9-12 and above12 months were observed as 5.50±0.327, 12.07±0.598, 19.62±0.738, 21.92±0.571, and 30.44±0.978 kg, respectively. The corresponding values for females were 5.36±0.229, 11.20±0.615, 17.90±0.373, 20.27±0.336 and 26.21±0.809 kg. The results revealed that males had more average weights than those of females at the same age groups. In both the districts, the differences between the male and female were found to be non-significant. No significant difference was reported in body weight among the animals of the same age group in both district but it varied significantly (P<0.05) in different age groups like 0-3, 3-6, 6-9, but did not vary in age group 9-12 and >12 month age group in Allahabad district and varied in 3-6, 6-9 and 9-12, >12 month of age group in Jaunpur district. It was also observed that the average body weights of goats of the two districts did not show any significant differences in any of the age groups. It may be attributed that the goats of the two districts studied might be of the similar strain of Jaunpuri breed of goat. The average body weights of the Jaunpuri goat observed in the present study were comparable to that of Barbari reported by Mittal (1979) and Singh et al.,(1979). However, the body weights of Jamunapari, Beetal reported by Mishra and Khan (1985), Acharya (1982), respectively were more than the present estimates. Whereas, Mukherjee et al., (1979) reported lower mean values of the body weights in Black Bengal at the similar ages or age groups.

Body length: The overall average body length of male goats of the age groups 0-3, 3-6, 6-9, and above 12 months were observed as 38.63±1.762, 48.55±2.900, 58.77±0.652, 67.23±0.777 and 67.56±0.747 cm, respectively. The corresponding values for females were 39.41±0.920, 45.74±0.908, 58.04±0.337 62.89±0.384 and 63.88±0.722...
cm. The results revealed no significant differences in average body lengths between the sexes of the same age groups in both the districts as well as for the same sex between the two districts, but it varied significantly (P<0.05) in different age groups like 0-3, 3-6, 6-9 and not varied in age group 9-12 and >12 month in both districts.

The average body length of present findings of Jaunpuri breed of goats was higher with the reports of earlier workers (Mukherjee et al., 1979 and Singh et al., 1979) in Black Bengal goats. However, the body lengths of Barbari and Jhakrana observed by Acharya (1982), Mittal (1979), Tiwari et al., (2002) respectively were almost similar the present estimates. The average body length of present findings of Jaunpuri breed of goats was higher with the reports of earlier workers (Mukherjee et al., 1979 and Singh et al., 1979) in Black Bengal goats. However, the body lengths of Barbari and Jhakrana observed by Acharya (1982), Mittal (1979), Tiwari et al., (2002) respectively were almost similar the present estimates.

**Chest girth:** The overall average chest girth of male goats of the age groups 0-3, 3-6, 6-9, 9-12, and above 12 months were observed as 42.88 ± 1.726, 53.64 ± 1.765, 67.46 ± 1.217, 73.69 ± 0.613, and 72.19 ± 0.586 cm, respectively. The corresponding values for females were 44.54 ± 0.896, 51.32 ± 1.799, 64.34 ± 0.457, 69.80 ± 0.423, and 69.36 ± 0.683 cm. The results revealed no significant differences in average chest girth between the sexes of the same age groups in both the districts as well as between the two districts for the same sex and pooled data, but it varied significantly (P<0.05) in different age groups like 0-3, 3-6, 6-9 month and not varied in age group 9-12 and >12 month of Jaunpuri goat.

The chest girth of Barbari breed of goat reported by Acharya (1982) was almost similar in comparison to present study. In another study, the mean values of chest girth of other Indian breeds (Jamunapari, Beetal, and Jhakhrana) were more than the present estimates as reported by previous investigators (Mishra and Khan, 1985, Acharya, Jhakrana) were more than the present estimates as reported by Acharya (1982), Mishra and Khan (1985), Acharya (1982), respectively. In the studies of Mukherjee, (1979) and Singh et al., (1979), the mean values of the height in Black Bengal were found to be less than the present estimates in Jaunpuri breed of goat at the similar age groups.

**Ear length:** The overall average ear length of male goats of the age groups 0-3, 3-6, 6-9, 9-12, and above 12 months were observed as 10.00 ± 0.654,12.18 ± 0.711, 14.15 ± 0.529, 15.15 ± 0.586 and 14.88 ± 0.539 cm, respectively. The corresponding values for females were 14.050 ± 0.891, 15.306 ± 0.375, 15.409 ± 0.403, 15.833 ± 1.364, 14.980 ± 0.385 and 17.740 ± 0.211 cm. The results revealed no significant differences in average ear lengths between the sexes of the same age groups in both the districts and no significant difference was observed in ear length among the animals of the same age group in both districts but it varied significantly (P<0.05) in different age groups like 0-3, 3-6, months and not differ significantly in 6-9, 9-12 and >12 month of age group. It seems that the genetic background of Jaunpuri goats available in the two districts were almost of similar types. Hasanat et. al. (2003) reported the average ear length of Black Bengal bucks and does at 12 months of age to be12.87 and 5.54 cm respectively, which were in close agreement with the results of this study.

**Tail length:** The overall average tail length of male goats of the age groups 0-3, 3-6, 6-9, 9-12, and above 12 months were observed as 7.50 ± 0.626, 8.818 ± 0.772, 9.690 ± 0.523, 11.15 ± 0.317, and 10.94 ± 0.322 cm, respectively. The corresponding values for females were 14.050 ± 0.891, 15.306 ± 0.375, 15.409 ± 0.403, 15.833 ± 1.364, 14.980 ± 0.385 and 17.740 ± 0.211 cm. The results revealed no significant differences in average tail lengths between the sexes of the same age groups in both the districts and no significant difference was reported in tail length among the animals of the same age group in both districts but it varied significantly (P<0.05) in different age groups like 0-3, 3-6, months and not differ significantly in 6-9, 9-12 and >12 month of age group. In the studies of Mukherjee (1979), the mean values of the height in Black Bengal were found to be less than the present estimates in Jaunpuri breed of goat at the similar age groups. Singh et al., (1979) conducted an experiment with Black Bengal goat and found that the tail length at 12 months of age was 11.3 ± 0.25 cm which was similar the result of the present study.

**Horn size:** The overall average horn size of male goats of the age groups 0-3, 3-6, 6-9, 9-12 and above 12 months were observed as 1.94 ± 0.346, 2.73 ± 0.449, 5.54 ± 0.584, 5.85 ± 0.696,-and 7.56 ± 0.381 cm respectively. The respective
average for female were 1.77 ± 0.171, 2.60 ± 0.173, 4.94 ± 0.322, 6.53 ± 0.424 and 6.79 ± 0.421 cm. The two sexes in both the districts did not show any significant differences in their horn size. The findings further indicated that the differences in the average horn size between the two districts were not significant and no significant difference was reported in horn size among the animals of the same age group in both district but it varied significantly (P<0.05) in different age groups like 0-3, 3-6, month of age group and 6-9, 9-12 and >12 month of age group are not differ significantly in both district. The average horn size of the Jaunpuri goats observed in the present study was comparable to that of Black Bengal Acharya (1982). However, the horn size of Jaunpuri (Acharya, 1982; Mishra and Khan, 1985), Barbari (Acharya, 1982) and Beetal (Alam, 2002) were more than the present estimates.

Carcass character of jaunpuri goat: The average slaughter weight of male goat belonging to 6,9 and 12 months of age at the survey were 11.60±0.4003, 16.80±0.583 and 18.40±0.501 kg and corresponding values in female were 11.30±0.489, 14.20±0.338 and 17.20±0.583 respectively. The results revealed no significant differences in average slaughter weight between the sex of the same age groups but it varied significantly (P<0.05) in different age groups like 6, 9 and 12 month of age.

The average carcass weight of male goat belonging to 6, 9, and 12 months of age at the survey were 6.10±0.331, 8.100±0.367 and 8.800±0.254 kg, respectively and corresponding values were 5.40±0.244, 6.900±0.291 and 8.400±0.430 in female. The results revealed no significant differences in average live weight between the sex of the same age groups but it varied significantly (P<0.05) in different age groups like 6, 9 and 12 month of age group. The present finding is higher than Black Bengal goat which produces about 6.0 kg more carcass (Devendra and Owen, 1983).

The mean value of dressing percentage of male goat belonging to 6, 9 and 12 months of age at the present investigation were 47.56±1.653, 43.95±1.126 and 44.90±0.779 % kg and corresponding values were 43.55±0.948, 42.560±1.273 and 44.11±0.747 % in female respectively. The results revealed no significant differences in average value of dressing percentage between the sex of the same age groups and in different age groups like 6, 9 and 12 months of age. The dressing percentage was found to be highest in goat of 6 months of age followed by 12 and 9 months. Chowdhury and Faruque (2004) reported dressing percentage of Black Bengal goat between 181 and 365 days of age was 46.4%. This is highly supported present investigation. Devendra and Owen (1983) reported the value of 48.10- 52.15% for Indian pure breed goats. This is the higher value than the present finding. The result of the present study revealed that the slaughter weight increased as the age advance. However, the dressing percentage was found to higher in goat of 6 month of age followed by 12 month and 9 months.

REFERENCES


