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Performance Evaluation of Barbari Goats in Semi-Arid Region of India: A Review

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Abstract

Barbari goat, a medium sized dual purpose goat breed in India, is known for its good lactation performance, high prolificacy, early maturity, low kidding interval, high kidding rate and better growth rate. The average weights of kids at birth, 3, 6, 9 and 12 month of age were 1.66±0.47, 5.88±0.41, 9.36±0.17, 12.85±0.25 and 16.08±0.35 kg, respectively. The average pre-weaning (0–3 months) daily weight gain was 59.9 g while post weaning (3–12 months) gain was 43.4 g. The feed conversion efficiency of this breed was 8.27±0.40% and is reported to vary from 6 to 10%. The average lactation milk yield at 90 and 140 days of lactation was 49.59±3.71 and 67.56±7.60 l, respectively with an average lactation length of 143.19 days. Regarding reproductive performance, the age of first mating and first kidding for this breed is reported as 12–14 and 17–19 months, respectively. The single, twin and triplet kidding varied from 50.6 to 59.0%, 32.3 to 39.8% and 5.59 to 10.67%, respectively. The average slaughter weight (kg), carcass weight (kg) and dressing (%) of adult animal of this breed was 25.57±1.73, 11.54±0.85 and 45.11±1.61 respectively. As the population of the breed in its home tract is declining over the years, so, there is a need for conservation of this breed. The central institute for research on goats (CIRG), Makhdoom, Uttar Pradesh, India has initiated to conserve this breed in its home tract.

Keywords*: Barbari goat, growth performance, milk yield, carcass evaluation, India*

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INTRODUCTION

The Barbari goat is one of the best dual purpose goat breeds in India. It has lactation performances similar to other Indian goat breeds and many desirable characters of meat breeds such as prolificacy, early maturity, low kidding interval, high kidding rate and better growth rate. The breed, quite important for milk and meat, is a dwarf breed and it is highly suited for rearing in cities and towns due to its small size and good adaptability to stall feeding conditions. In addition to being a good milker, it is also highly prolific. The breed is of medium to small in size and known for its high fecundity, reproduction, milk production and body weight growth. The outstanding quality of this breed is its habitat of stall feeding which makes it most suitable for cities and towns where grazing facilities are lacking.

DISTRIBUTION/NATURAL HABITAT/POPULATION

This breed originated from Berbera in Somalia Republic of East Africa. The route of their migration to India has not been known, but in all its probability the traders of mediaeval period might have brought them through sea and land routes during their business entourage to India [1]. In India, the home tract of this breed is from semi-arid region of Agra, Aligarh, Etah, Etawah, Mathura and Kanpur district of Uttar Pradesh and Bharatpur district of Rajasthan. It is also found in Gurgaon, Karnal, Panipat and Rohtak in Haryana. However, Barbari goats and its variants can be seen in many parts of India. The agro-climatic condition of the natural habitat of this breed is semi-arid. The average temperature ranges between 2°C in winter and 48.5°C in summer. The annual rainfall is 750 mm and is spread over a period of 50 rainy days. The monsoon arrives in mid-July and is active till mid-September. The approximate population of Barbari goat in the Barbari distribution area was 3.15 million as per the census report (2007) of the department of animal husbandry, dairying and fisheries, ministry of agriculture, government of India.

Physical Characteristics

The Barbari goat is a medium sized, dual purpose breed [2]. The animal is having short hair with compact body. The orbital bone is quite prominent, so that eyes appear bulging. The animal looks very attractive and alert. The coat colour varies with white, red and tan spots.

Fig. 1: *Figure Showing Barbari Female with Fully Developed Wedge Shaped Pendulous Udder.*

Fig. 2: *Figure Showing Barbari Male with Well-Developed Testes.*

The white with small light to dark brown patches coat colour is the most typical. The animal is having straight face line. Ears are short, tubular, almost double, with the slit opening in front, erect, directed upward and outward. Legs are also short and having fine bones. Both sexes have twisted horns, medium in length and directed upward and backward and outward. The males have much longer and stronger horns than females. The average horn length is reported to be 11.17±0.27 cm [3]. In most of the cases, bucks have large thick beard. However, some of the animals have wattle. Does have fully developed wedge shaped pendulous udder with round and conical teats of good length (Figure 1). Bucks have well developed testes (Figure 2). The body length of bucks and does ranges from 96 to 112 cm, and 91 to 114 cm, respectively and the height ranges from 66 to 76 cm and 61 to 71 cm, respectively.

Husbandry Practices

Farmers generally reared Barbari goats on browsing and extensive grazing stubble of cultivated crops and tree leaves. The bigger flock size of goats under village condition is very less and the farmers prefer to keep small flock size. Normally, the grazing starts in the early hours of the day and continues till evening. Both males and females are allowed to graze together. Ladies, children and aged person are mainly engaged in grazing activity of animals. They usually graze their animals for about 8–9 h in the common grazing land. The grazing areas mainly consist of wasteland, panchayat land, harvested field and roadside land under village condition. Goats are mainly maintained on tree leaves, seasonal grasses and small quantity of concentrates at village condition. Cultivated fodders (e.g., berseem, wheat straw) and grains (e.g., maize, barley, millet) are mainly offered in villages. Goats are generally provided drinking water by the households where the flock size is very less. Normal practice of watering the animals in the village condition depends upon the available water resources like the village ponds, rivers, nallahs etc. Under farm condition, animals are mainly reared under semi-intensive feeding management with 6 to 7 h grazing and some quantity of concentrate. The kids were separated from their mother at 3 months of age and provided with kid ration under farm conditions. Generally, no specialized shelters are provided to goats in the villages. Goats are housed in small enclosures with thatched roof or in the house where inmates live. In winter, sufficient protection from cold is ensured by taking adequate measures. Majority of farmers keep the goats in their own houses and some

of the farmers provided improved shelter to their animals. Very small numbers of farmers who are having large flock size (more than 15 goats) use thatched huts for goats. Housing period differs from season to season but during night period, goats are kept inside the house. Farmers usually keep their animals on kachcha (consisting of straw, sand and mud) floor, which are erected with wooden materials/muddy walls. Only few houses have pucca (brick) floor. During winter season, dry grasses or wheat bhusa is used as bedding in order to protect the animals from cold. In villages, most of the males are castrated at ages between 7 and 30 days by the open method with a blade, and are fattened on milk for slaughter on festive occasions. Sometimes, deworming of animals is done twice/thrice in a year. No dipping is practised in the farmers' flock. Treatment of sick animals is done from the veterinary hospital or from the indigenous practitioners.

Production Characteristics

Body Weights

The average weight of Barbari goats at birth, 3, 6, 9 and 12 month of age were 1.66±0.47, 5.88±0.41, 9.36±0.17, 12.85±0.25 and 16.08±0.35 kg, respectively at farm level [4]. The estimates of these weights during different years in respect to average body weights at birth, weaning, 6, 9 and 12 months of age ranged from 1.59±0.05 to 2.04±0.03, 4.68±0.62 to 8.45±0.16, 7.07±0.26 to 11.59±0.23, 11.01±0.41 to 17.32±0.57 and 12.47±0.46 to 20.59±0.53 kg, respectively [5–10]. However, higher body weights at birth (2.19±0.06 kg), 3 month (8.28±0.29 kg) and 6 month (12.40±0.42 kg) of age were observed in this breed at village level [11]. Male animals showed higher body weights than their female counterpart at all ages. Single born kids exhibited higher birth weight than those born as twins or triplets. The average pre-weaning (0–3 months) daily weight gain was 59.9 g while post weaning (3–12 month) gain was 43.4 g in farm condition [12]. These values are reported to range from 55.6 to 75.4 g and 31.1 to 43.4 g, respectively during different years [13, 9, 10]. The average feed conversion efficiency of this breed was 8.27±0.40% and is reported to vary from 6 to 10% [14].

Lactation Performance

The average lactation milk yield at 90 and 140 days of lactation was 49.59±3.71 and 67.56±7.60 l, respectively at farm level whereas the corresponding figures were 73.46±1.96 and 101.85±4.37 kg, respectively at village condition [11]. The average pre-weaning (90 days) milk yield varied between 43 and 57 l and 140 days milk yield varied between 65 and 73 l in other studies [9, 15]). The average lactation length was 143.19 days, which varied from 75.8 to 151.65 days [8, 15, 16]. The peak milk yield obtained varied from 1.4 to 2.3 l. The peak yield was obtained in the 4th to 5th week of lactation and thereafter decreasing trend was observed. The average milk yield per day of lactation was 520 ml, which varied from 440 to 600 ml over different seasons. Does kidded as single, twin and triplet, do not differ in their lactation production abilities. The average fat, lactose, protein, solid-not-fat and total solid content of Barbari milk was estimated as 4.65±0.01, 4.02±0.01, 4.04±0.01, 8.88±0.02 and 13.81±0.02%, respectively (Kala and Prakash, 1990) [17].

Reproductive Performance

Goats in village condition are bred round the year but two clear peaks (March–April and September–October) are found. As a practice, farmers allowed their animals only for natural breeding. Since the bucks and does are housed and grazed together, no controlled mating is practiced at farmers' level. However, controlled breeding is practised in Government/commercial farms. At the farmers' level, the age at first mating was estimated at 15–18 months. The percentage of single, twin and triplet births ranged from 40–46%, 48–54% and 2–7%, respectively. The kidding rate (i.e., number of kids born out of 100 does) was reported to vary 156 to 162% under village condition. Studies under AICRP on goat improvement at CIRG, Makhdoom, Mathura, Uttar Pradesh, reported 12–14 months as the age of first mating in does and 17–19 months as age at first kidding under restricted breeding programme. The single, twin and triplet kidding over the years were reported to vary from 50.6 to 59.0%, 32.3 to 39.8% and 5.59 to 10.67%, respectively. The kidding percent varied from 91–117% in farm

condition [4]. The highest kidding rate ever observed in the farm condition was 1.74. Some proportion of abortion was observed in village condition.

Carcass Evaluation

The average slaughter weight (kg), carcass weight (kg) and dressing (%) of adult animal of this breed was 25.57±1.73, 11.54±0.85 and 45.11±1.61 respectively [18]. Moreover, the meat, bone and fat percent obtained from kids of 9–12 months of age were 73.85±0.76, 23.45±0.48 and 4.45±0.44, respectively [19]. The average estimates (%) of different cuts viz., leg, loin, rack, neck and shoulder and breast and fore saddle were 26.24±0.36, 16.94±0.36, 13.07±0.33, 27.73±0.40 and 16.18±0.40%, respectively. Pal and Agnihotri reported that slaughter age for goats might be around 1 year to have reasonably good distribution of carcass fat, which decreased with increase in age [20]. Prasad *et al.* was of opinion that the carcass percentage was higher and non-carcass percent was lower in Barbari and Jakhrana kids than that in yearlings of similar carcass weight [21].

Disease Pattern/Survivability and Disposal

The overall survivability of this breed is estimated as 90–92% under farm conditions, whereas this figure varied from 93–95% in village condition. The highest mortality was observed in 0–3 months of age. The post-weaning mortality was much lesser as compared to pre-weaning mortality.

The pre-weaning mortality rate, averaged for both sexes, is reported to range from 6–7%, whereas post weaning mortality is still low. The major causes of mortality in field condition are low birth weight, pneumonia, coccidiosis etc. Deworming and vaccination against FMD, PPR, H.S. are the common preventive measures, generally adopted by the villagers. Male kids are not generally retained by the farmers beyond 3 months of age and disposed off for meat purpose. Most of the male kids are sold between the age group of 3 and 6 months of age. Sale of adult males is negligible but among the adult female, stock disposal through sale was observed. Only few selected bucks are generally kept for breeding purpose.

Conservation and Genetic Improvement Programme

Considering the number of animals reported, there is a serious need for undertaking conservation measures. It was observed in personal surveys that most males are castrated early in life and fattened for slaughter at religious festivals, so that a sizeable number of non-descript goats are kept for milk production by owners who maintain Barbari, as all the milk of the latter is allowed to be suckled by their kids to ensure good health. Moreover, there has been decline in the population of the breed in its home tract over the years. So, there is a need for conservation of this breed. The central institute for research on goats (CIRG), Makhdoom, Uttar Pradesh, India has started the selection of superior bucks based on their live weight at 6 month of age and first lactation dam's milk yield. The selected bucks have been supplied in the field for effecting the improvement in farmers' flocks.

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