

Black Bengal goat farming: an important component for integrated farming system

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ABSTRACT

The present work was done in two blocks viz., Haringhata and Hanshkhali blocks of Nadia district of West Bengal during January, 2011 to December, 2013 where "Front Line Demonstration on Black Bengal goats" of Nadia KVK, BCKV is being initiated for study on Black Bengal goat farming: an important component for integrated farming system. The goat farming is much popular amongst the ST (48.5%), followed by SC (29.5%) and General Caste (18.5%), whereas only 4.5% of goat farmers belong to OBC. 8.5% farm women keeping buck was able to earn on an average Rs. 3960.00 per year through servicing the does @ Rs. 20.00 per service. Total distribution of types of birth of Black Bengal goats were 35.82% singlet, 47.59% twins and 16.57% triplets in 1st year; 30.63% singlet, 58.38% twins and 10.98% triplets in 2nd year and 40.41% singlet, 54.58% twins and 5% triplets in 3rd year. The body weight was statistically significant ($p < 0.05$) between the male and female at birth, 3 month, 6 month, 9 month and 12 months age of Black Bengal goats. Male goats were significantly ($p < 0.05$) heavier than their female counterparts at all the age groups of Black Bengal goats studied viz., at birth and at 3, 6, 9, and 12 months of age and also in all types of birth viz., singlet, twins and triplets.

Key words : Black Bengal goat, demographic profile of goat keepers, growth performances, housing, feeding system

Goat is one of the earliest discoveries of mankind in prehistoric times as a ready and easy source of meat. Goats play a vital role in the economy of poor dwellers living in diverse climatic conditions of India. In rural areas goat keeping generates employment @ 4.2% per annum (Dhara *et al.*, 2008). India is rich in goat population (16.7% of world share) and its genetic biodiversity (FAO, 2010). There are 23 recognized breeds of goats in India (NBAGR, 2014). The goat is often termed as 'poor man's cow' having diverse ecological adaptability over a wide range of agro-climatic zones. It is preferred over other livestock particularly in drought prone and tribal areas due to its inherent characteristics of faster multiplicity, smaller size, easy handling, higher digestive and reproductive efficiency, better survival under scarce, minimal biomass and in degenerated environments, better disease tolerance and its substantial contribution in the economy of rural poors, besides meeting their nutritional requirements. Goats require minimal capital investment to be reared and they are highly prolific breeders having very high commercial value and demand of a good price in the market at all the times (Ramdas, 2000). The socio-economic studies revealed that in West Bengal goat rearing proved more beneficial to the goat keepers having basic knowledge of animal husbandry (ICAR, 2007-2008). Bengal goat, one of the oldest companions of human being is a versatile animal supplying nutrition, protection, support service and
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above all association to their keepers. They are considered as the fixed deposits for the poorest of the poor supplying fund as and when needed by virtue of their ready market demand (Sahoo *et al.*, 2004). Keeping in view of its association a study was conducted with four specific objectives, viz., (i) to study the demographic profile of the goat farmers, (ii) to study the housing and feeding systems followed by the farmers for keeping goats, (iii) to study the distribution of types of birth in Black Bengal goats and (iv) to study the body weight of Black Bengal goats in their home tract.

MATERIALS AND METHODS

The present work was done in two blocks viz., Haringhata and Hanshkhali blocks of Nadia district of West Bengal during January, 2011 to December, 2013 where "Front Line Demonstration on Black Bengal goats" of Nadia Krishi Vigyan Kendra, Bidhan Chandra Krishi Viswavidyalaya, Gayeshpur, Nadia, West Bengal is being initiated for study on Black Bengal goat farming: an important component for integrated farming system. The district Nadia is selected purposively. It lies between 22°52'30" and 24°05'40" parallels of North latitudes and 88°08'10" and 88°48'15" meridians of East Longitudes. Five villages from two blocks have been considered for this study, viz., Mollabelia, Panpur, Kurumbelia, Nischintapur and Madhpur villages of Haringhata block and Gopalpur, Betnakutirpara, Muchiphulbari, Itabaria and Dhakuria villages of Hanskhali block of Nadia district of West Bengal. From

each of the selected villages, 20 respondents have been selected randomly. In this way 200 respondents have been selected from 10 villages of the two blocks which have been constituted the sample of the present study. The study area is located in the worm-humid zone having three distinct seasons, viz., summer, monsoon and winter.

A pilot study was carried out, and accordingly a structured interview schedule was constructed. The data has been collected through face-to-face interview with the farmers and by direct observation of the goats. Data pertaining to farmers' socio-economic parameters viz. caste, sex, education, occupation, income from buck of farm women and annual income were recorded by computing percentage. Information on housing and feeding systems of goat rearing like housing duration, housing location, type of houses, type of floor, roofing pattern, feeding and grazing pattern were recorded. For body weight, a total of six hundred (600) Black Bengal goats were selected irrespective to sex from 200 families from 10 villages of the two blocks. All the animals under study were neck tagged to maintain individual identity. The data were collected over three years from January, 2011 to December, 2013. Separate data sheet for each animal was maintained for recording data. Black Bengal goats aged from birth to 12 months were used for body weight. The experiment was also designed to collect information of distribution of types of birth and data pertaining to the body weight of male and female at birth, 3 month, 6 month, 9 month and 12 month of age of Black Bengal goats. Birth weight of animal was recorded within 12 hours of kidding. Growth of individual kid was measured in terms of its body weight in the subsequent periods profiled viz., 30 day weight, 90 day weight, 180 day weight, 270 day weight and 365 day weight as included in the present investigation, both males and females being recorded to examine the sex effect. The body weight was taken in the morning hours in fasting condition of kids/goats or before the kids/goats were allowed for grazing. The birth weight and subsequent body weight was taken with the help of Dial-type spring balance (Salter, 20 kg capacity with 200 g graduation) and expressed in kg. Data were analyzed following the standard statistical methods (Snedecor and Cochran, 1967).

RESULTS AND DISCUSSION

Demographic profile of the goat keepers

The demographic profile of the goat keepers in terms of caste, sex, education and income is presented in table 1.

Caste

Analysis of the data revealed that the goat farming is much popular amongst the ST (48.5%), followed by SC (29.5%) and General Caste (18.5%), whereas only 4.5% of goat farmers belong to OBC (Table 1). Nandi *et al.* (2011) reported that the goat farming is much popular amongst the SC (44.97%), followed by General Caste (26.30%) and by ST community (24.30%), whereas only 4.42% of goat farmers belong to OBC. Samanta *et al.* (2009) reported that the general trend of goat farming is preferred by the SC and ST communities over others, and most of the OBC people do not prefer goat farming; this finding is in accordance to present findings.

Table 1: Demographic profile of goat keepers in selected villages of Nadia district of West Bengal

Caste	General	37	18.5
	OBC	09	4.5
	Scheduled Caste	57	29.5
	Scheduled Tribe	97	48.5
Sex of farmers	Men	22	11
	Women	178	89
Education of farmers	Illiterate male	10	5
	Primary standard male	07	3.5
	Secondary standard male	05	2.5
	Illiterate female	91	45.5
	Primary standard female	72	36
Occupation of farmers	Secondary standard female	15	7.5
	Landless, small and marginal farmers	106	53
	Agricultural labourers	80	40
	Small business holders	11	5.5
Income from buck of farm women	Service men	03	1.5
	₹ 3960.00 per year through servicing the does @ ₹ 20.00 per service	17	8.5
Annual income	Low income group (within ₹ 15000.00)	120	60
	Medium income group (Rs. 15000.00-25000.00)	57	28.5
	High income group (Above ₹ 25000.00)	23	11.5

Sex

Women members of farmers' family played a major role (89%) in the rearing of goats. However, the male members of the family were also involved (11%) in rearing of the animals (Table 1). Almost entire activities, so far as washing and cleaning of goat sheds and feeding of goats, were being performed by the women.

However, child members also played certain role in grazing and kid rearing. Male members were used to take decision in selling or purchasing of goats. Breeding of the dose was mostly arranged by male members, while parturition was attended by the female members. The present finding is supported by the earlier workers (Nandi *et al.*, 2011 and Samanta *et al.*, 2009). Miazzi *et al.* (2008) also observed that the rural women can play an important role in goat rearing because the enterprise of goat is mostly cared by them.

Educational status

More than half of the goat keepers under study were illiterate (50.5%); out of which 5% were male and 45.5% were female (Table 1). This finding is corroborated with findings of Samanta *et al.* (2009) and Nandi *et al.* (2011) who reported that the maximum goat farmers are illiterate in both sexes.

Occupation

Goat farming is much popular amongst the landless, small marginal farmers (53%), followed by the agricultural labourers (40%), whereas, only 5.5% of small business holders and 1.5% of service men are involved in goat husbandry (Table 1). Tudu *et al.* (2004) observed that the tribal goat-keeping respondents were marginal farmers; had a small herd size; were engaged in agriculture as their main occupation. Samanta *et al.* (2009) reported that 57.44% of the farmers were dependent on both agriculture and animal Husbandry as main source of earning. 23.08% depended only on Agriculture and 8.31% of farmers solely depended on Animal Husbandry. Nandi *et al.* (2011) reported that the goat farming was more popular amongst the landless, small and marginal farmers (58.1%).

Income from buck of farm women

The results have been revealed that 8.5% farm women keeping buck was able to earn on an average ₹ 3960.00 per year through servicing the does @ ₹ 20.00 per service (Table 1).

Income of farmers' family

Annual income of most of the goat farmers (60%) was within ₹15000, and 28.50% farmers earned medium annual income (₹15000-25000), and only 11.50% farmers earned more than ₹ 25000 per year (Table 1). Tudu *et al.* (2004) observed that the tribal goat-keeping respondents were earning less than ₹ 7000 per year from all sources. Samanta *et al.* (2009) reported that annual income of most of the goat farmers (40.11%) was within ₹5,000.00, whereas 24.36% and 27.09% farmers earned Rs. 5-10 thousands and 10-20 thousands respectively; and only 8.80% farmers earned more than ₹ 20

thousands per year. Nandi *et al.* (2011) reported that the annual income of most of the goat farmers (64.47%) was within ₹10,000, and 26.73% farmers earned within ₹10,000-20,000, and only 8.80% farmers earned more than ₹ 20 thousands per year.

Goat housing and feeding system

Goat housing and feeding systems followed by the goat keepers in the selected villages of Nadia district is presented in Table 2.

Table 2: Goat housing and feeding system followed by the goat keepers in selected villages of Nadia district of West Bengal

Variables	Category	Families rearing goats (No.)	Percentage (%)
Housing duration	Night only	102	51.00
	Both day and night	35	17.50
	No housing	63	31.50
Housing location	With other animal	75	37.50
	With human	55	27.50
	Separately	70	35.00
Type of houses	Kachcha	147	73.50
	Pucca	12	6.00
	Partially pucca	41	20.50
Type of floor	Earthen floor	151	75.50
	Brick finished	45	22.50
	Cement floor	4	2.00
Roofing pattern	Covered	31	15.50
	Half covered	71	35.50
	Open	98	49.00
Feeding pattern	Grazing		
	Grazing from morning to noon	177	88.50
	Grazing separately in morning and afternoon	23	11.50
	Tethering		
	Adoption of tethering grazing	79	39.50
Source of drinking water	Grazing without tethering	121	60.50
	Pond water	87	43.50
	Well water	47	23.50
Grazing pattern	Tube well water	66	33.50
	Individual	115	57.50
	Group or community	67	33.50
	Others	18	9.00

Goat housing system

Survey indicated that majority of farmers kept their goats confined during night only (51%), some farmers

kept their goats confined during both day and night (17.5%) and no housing was provided to goats in 31.5% cases. Farmers housed their goat with other animals (37.5%) and with themselves in their dwelling places (27.5%); 35% farmers kept their goats separately. Results indicated that 73.5% farmers housed their goats in *kachcha* house, 6% in *pucca* and 20.5% in partially *pucca* house. Floor was found to be earthen floor (75.5%), brick finished (22.5%) and cemented floor (2%). Roofing pattern was found to be covered (15.5%), half covered (35.5%) and open (49%) (Table 2). Sahoo et al. (2004) observed that the farmers used varieties of materials for construction of goat house and only 8.5 % used brick in earthen or cement mortar. He also observed that goats were housed separately (63.5%), with other animals (16.7%) or along with human being in their residence (19.8%). Singh and Rai (2004) observed that goat shelters were made of local materials with inadequate floor space and ventilation. Kamble et al., 2014 reported that dry climate is better in byre especially during rainy season.

Goat feeding system

From the survey data it was found that 100% of the goats were reared through grazing. Of this 88.5% farmers allowed their goats for grazing from morning to noon, and 11.5% farmers allow animals to graze separately in morning and afternoon with a rest at noon. During critical period, very few farmers used mainly mineral mixture and concentrate feed along with tree leaves and tree tops. About 39.5% of small flock holders used to rear goats by tethering where facilities for grazing are limited. This simple device has made possible of keeping goats out-of-doors and at the same time on a limited area. Farmers reared the animals by individually (57.5%) as well as by group or community (33.5%). Pond water as the source of water for goats was found to be very common (43.5%) and in only 23.5% cases farmers used well water and 33.5% tube well water (Table 2). Sahoo et al. (2004) observed that 54.4% farmers had arrangement for feeding and watering in their goat houses. The farmers used bucket (46.2%), metal tub (46.4%) and earthen pot (7.4%) for supplying drinking water to the animals.

Distribution of types of birth in Black Bengal goats

Distribution of types of birth of Black Bengal goats is presented in table 3. Total distribution of types of birth of Black Bengal goats were 35.82% singlet, 47.59% twins and 16.57% triplets in 1st year, 30.63% singlet,

58.38 twins and 10.98% triplets in 2nd year and 40.41% singlet, 54.58% twins and 5% triplets in 3rd year. The present findings of multiple birth are in close conformity with the findings of Kanaujia et al. (1986), Husain et al. (1990), Misra and Sinha (2001) and Samanta et al. (2009); however, they reported the trait in case of Black Bengal goat only. Lower incidence of multiple births was reported by Singh et al. (1987) and Verma et al. (1991). This may be due to difference in genetic makeup of the goat breeds studied by the respective workers.

Table 3: Year wise distribution of types of birth in Black Bengal goats

Year	Kids born (No.)	Distribution of types of birth		
		Singlet	Twins	Triplets
1 st year	187	35.82 (67)	47.59 (89)	16.57(31)
2 nd year	173	30.63 (53)	58.38 (101)	10.98 (19)
3 rd year	240	40.41 (97)	54.58 (131)	5.00 (12)

Figures in the parenthesis indicate number of observation

Body weight of Black Bengal goats

Body weights of male and female of Black Bengal goats at birth and at 3, 6, 9 and 12 months of age are presented in Table 4. The body weight of Black Bengal goats were increased with age in both the sexes. The body weight was statistically significant (pd" 0.05) between the male and female at birth, 3 month, 6 month, 9 month and 12 month age of Black Bengal goats. It is expected from any such study. Singlet was significantly (pd" 0.05) heavier followed by twin and triplet at birth and also at subsequent ages (at 3 month, 6 month, 9 month and 12 months) in Black Bengal goats. Male goats were significantly (pd" 0.05) heavier than their female counterparts at all the age groups of Black Bengal goats studied viz., at birth and at 3, 6, 9, and 12 months of age and also in all types of birth viz., singlet, twins and triplets. This result was supported by Gyaneshwari et al. (2007) on the basis of their work on Black Bengal goats. Heavier weight of male kids at birth might be due to the anabolic effect of male sex hormones during the prenatal development. This trend was continued during the later part of life. This may be due to aggressive behaviour of males during feeding and suckling mother along with anabolic effect of male sex hormone. Similar observations were reported by Koratkar et al. (1998) in Osmanabadi goat, Husain et al. (1996) in goats of Bangladesh, Ghosh et al. (1994) in

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