Breeding and production performance profile of Black Bengal goats in rural areas of Mymensingh in Bangladesh

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Abstract

The present study was conducted to know the breeding and performance profile of Black Bengal goat in 4 upazila (Mymensingh Sadar, Fulbaria, Trishal and Muktagacha) of Mymensingh district. The data were collected using a pre-tested questionnaire from 100 goat rearers. The questionnaire included primary information about goat owners, total number of goats, color pattern, birth information, fate of male kids, weight of kids, breeding system and source of breeding males, breeding cost, litter size, kid mortality, some management parameters on goat and goat rearing system under rural condition. On an average, goat per family at Mymensingh district was found to be 3.56 ±1.77 where the percentage of does and bucks were 90.61% and 9.39% respectively. Most of the farmers were found not to keep male kid for bad odor and difficult management and hence castrate them. Almost all farmers depend on natural mating to serve their does by passing a significant distance. The average service charge was found BDT 70.90±1.77, which differs significantly (P< 0.05) among four upazilas. No significant difference was found in performance of goats among four upazilas. The average body weight at 3 and 6 months of age of female goats were 4.67 ± 0.15 and 7.12±0.14 kg respectively. The average litter size was found 1.76±0.75 and the average kid mortality rate was 12.88% in Mymensingh district. From this study, it became evident that acute shortage of Black Bengal breeding bucks exists in the rural areas which may represent the overall situation of the country.

Key words: breeding, performance, Black Bengal goat

Introduction

Black Bengal goats are dwarf goats and are known to be famous for its adaptability, higher disease resistant, fertility, fecundity, early sexual maturity, larger litter size, delicacy of meat and superior skin quality (Devendra and Burns 1983; Husain *et al.*, 1998, Islam 2001). Out of 1005.60 million world goat population, Asia itself possesses about 597.15 million which is almost 59.38% of the total world population (FAO, 2013). Among the Asiatic countries, Bangladesh has got the fourth highest population of goats which accounted for about 25.61 million heads (BER, 2014). About 90 percent of goat population comprised the Black Bengal goats (Amin *et al.*, 2001). The higher demand of meat and skin in the local as well as foreign markets focused the goat enterprise extremely prominent to the vulnerable group of people in the existing socioeconomic condition of the country (Husain, 1993).

It is observed about 80% of the goats are being reared by the landless and marginal farmers living in the rural areas of the country. They generally follow the extensive management system, primarily with poor natural vegetation and crop stubbles, with or without any supplementation. More importantly, above 98% of Black Bengal goats are being managed in the traditional village system of the country (Husain *et al.*1998) where mature and quality breeding bucks are not available. Government has some breeding buck selling program at subsidized rate from government goat farms but those on-station bucks are not popular among the users. On the other hand, BRAC is in operation of an artificial insemination program in Black Bengal goat whose buck station is located in Shambuganj, Mymensingh but the said service could not be sustained in the whole country due to cost effectiveness. Therefore, quality bucks for breeding service is not available in rural villages.

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It was also reported that farmers were bound to depend on the community based buck breeding system with unknown pedigree. Almost 100% of the farmers in Lalmonirhat, Rangpur, Tangail and Khulna districts served their does naturally by these unknown pedigree and low quality breeding bucks (Khandoker *et al.,* 2011). As a result, unplanned and haphazard breeding has been in operation in our country. In some cases, it is a matter of great concern that crossbreeding has been performed which not only decreases the purity but also leading to the genetic dilution of Black Bengal goats. On the other hand, due to unavailability of Black Bengal breeding bucks, the same buck has been used generation after generation. As a consequence, inbreeding depression may be increased which is ultimately responsible for the gradual decline of overall productivity of goat (Khandoker *et al.,* 2011*)*. In this context, the present study was conducted to identify current breeding practices and the performance of Black Bengal goats in rural areas of Mymensingh district.

Materials and Methods

The field experiment was conducted in four upazila of Mymensingh district viz. i) Sadar, ii) Fulbaria, iii) Muktagacha and iv) Trishal. In order to obtain field data a random door to door survey was conducted in the goat-owners households of the aforementioned regions. Data associated with live goat were taken directly from the goats in the farmers premises. Information from the farmers was collected through direct interviewing using a pre-tested questionnaire. The questionnaire included primary information about goat owners, total number of goats, coat color pattern, birth information, fate of male kids, body weights of kids at 3 and 6 month, breeding system and source of breeding males, breeding cost, some management parameters on goat and goat rearing system under rural condition.

Three traits such as body weight, litter size and kid mortality rate were studied in this experiment. The body weights of kids were measured out at 3 and 6 months respectively. Animals were weighed with the help of weighing balance. Number of live kid(s) born was considered in this study as litter size. Mortality of kids was referred to as the ratio of kid died at 3

month of age in respect to total number of kids born. All the data obtained from the four upazilas were organized, structured and analyzed using the ANOVA procedure under Statistical Analysis System (SAS) version 9.1.3 (2004).

Results and Discussion

Categories of respondents

Among 100 respondents 30, 30, 20 and 20 respondents were from Mymensingh Sadar, Fulbaria, Trishal and Muktagacha upazila respectively. Selected characteristics of the respondents ― indicated that most of the respondents (67%) were of young age group i.e. 15-29 years old (Table 1). Among respondents nearly one half farmers were illiterate (48%) and only 6% farmers were highly educated (Table 1). About 49% of farmers were landless and most of the respondents were involved in agriculture occupation (52%).

Table 1. Categories of respondents

Characteristics	Scoring method	Categories	Respondents (N=100) No. /percent
Age	Years	Young (15 to 29)	55
		Middle (30 to 49)	36
		Old (50 and above	9
Education	Year of Schooling	Illiterate (0)	48
		Primary (1 to 5)	38
		Secondary (6 to 10)	8
		Higher education (11 and above)	6
Land Type	Acre	Landless (0 to 0.49)	49
		Marginal (0.50-1.49)	44
		Small (1.5 to 2.49)	7
		Large(7.50 and above)	0
Occupation	Type	Agriculture (1)	52
		Labour (2)	6
		Business (3)	10
		Service (4)	6
		Others (5)	26

Goat per family

The average goat per family at Mymensing Sadar, Fulbaria, Trishal and Muktagacha were found to be 3.26±0.283, 3.1±0.343, 4.40±0.372, 3.85±0.399 respectively. No significant difference was found in average goat per family among the upazilas. Trishal upazila had the highest density of Black Bengal goats compared to other upazilas

whereas maximum and minimum numbers were 8 and 2 respectively (Table 2).

Table 2. Average goat per family

Upazila	No. of goats per family			P Value
	Mean ± SE (N)	Maximum	Minimum	
Mymensingh Sadar	3.26 ± 0.28 (30)	9	1	
Fulbaria	3.1 ± 0.34 (30)	8	1	
Trishal	4.40 ± 0.37 (20)	8	2	0.053*
Muktagacha	3.85 ± 0.39 (20)	8	1	
Overall	3.56 ± 1.77 (100)	9	1	

*Non significant at 5% level.

Sex distribution

The percentage of does and bucks of Black Bengal goats in Mymensingh sadar and Fulbaria were 89% and 11% respectively and percentage of does and bucks in Trishal and Muktagacha were 93% and 7% respectively (Figure 1: a-e) All the farmers (100%) of four upazilas castrated their male kids. Alam (2006) reported a distribution of 55% doe, 5% buck and 40% wether of Black Bengal goat in Sylhet and Bogra. He also reported that 54% doe, 4% buck, 42% wether at Sylhet, 67% doe, 5% buck, 28% wether at Mymensingh and 58% doe, 4% buck, 38% wether at Bogra which are close to current findings.

Fate of male kids

The reasons opined by the farmers not keeping male kids for breeding bucks include bad odor (81%) and difficult management (19%) in four upazilas. Castration of male kids was done at less than one month of age (by 69% of goat rearers) and at less than 2 month of age (by 24% of goat rearers), whereas only 7 percent respondents castrated their male kids at less than 3 month of age in Mymensingh district (Table 3). Jana *et al.* (2014) conducted a study in Burdwan district of West Bengal and reported that castration of male kids was done at 5-7 weeks of age (by 76.67% of goat rearers) and at more than 7 weeks of age (by 14% goat rearers), whereas only 9.33 per cent respondents castrated their kids at 2 to 4 weeks of age. This fate of male kids could be considered as one of the main reasons behind lack of availability of quality bucks for breeding Black Bengal goats in the study area and country at large.
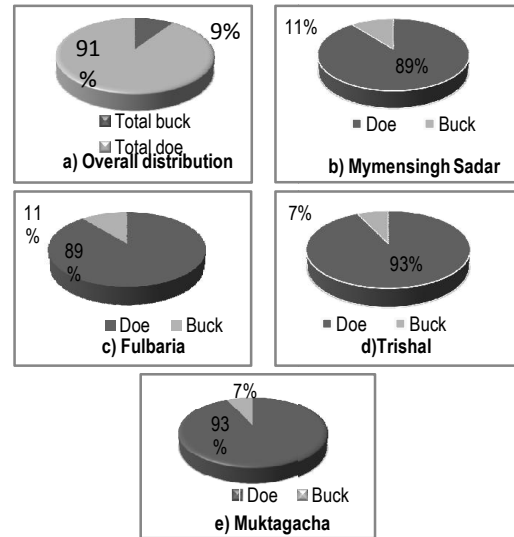

Figure 1. Distribution of Black Bengal goats according to sex in each upazila

Breeding place for serving doe

There was a scarcity of breeding bucks. The bucks available in the area were small and without any pedigree. Hence the farmers in the study area did depend on the community based buck breeding system.

Table 3. Time of castration of male kids

Upazila	Less than one month	Less than two month	Less than three month
Mymensingh Sadar	73.33%	23.33	3.33
Fulbaria	66.67%	26.67	6.67
Trishal	85.00%	10.00%	5.00%
Muktagacha	55.00%	45.00%	0.00%
Overall	69.00%	24.00%	7.00%

Type of mating

All respondents (100%) in four upazilas were found to dependent on natural breeding for their does. There was no government or private AI worker in and around villages for doe servicing. So, they did depend on community based buck breeding system (Table 4).

Breed of buck used in servicing

The bucks used for servicing does were Black Bengal goat in all the study areas with unknown records (Table 4).

Table 4. Different breeding criteria of goat in Mymensing district

Criteria	Mymensingh Sadar	Fulbaria	Trishal	Muktagacha
Fate of male kids	Castration	Castration	Castration	Castration
Type of Mating	Natural	Natural	Natural	Natural
Service station	Private	Private	Private	Private
Breed	Black Bengal	Black Bengal	Black Bengal	Black Bengal

Distance between breeding buck and does

It was observed that about 30% farmers had to pass a high distance (more than 3.0 km) to bred their does in four upzilas of Mymensingh district whereas 20% farmers need to pass a medium distance (1.0-3.0 km) and rest of the 50% farmers have to pass a low distance (0.1-0.9 km).

Table 5. Distance between breeding buck and does

Upazila	Categories* (%)		
	Low (0.1-0.9 km)	Medium (1.0-3.0 km)	High (More than 3.0 km)
Mymensingh Sadar	67	33	0
Fulbaria	33.33	33.33	33.33
Trishal	100	0	0
Muktagacha	0	0	100
Overall	50	20	30

*Data in the column indicates the respondent percentage (N=100) of four upazilas

The distances farmers need to cover between breeding buck and does in four upazilas are presented in Table 5. Khandoker *et al.* (2011) reported that about 58% farmers had to pass a long distance (more than 3.0 km) to breed their does in Mymensingh district whereas 30% farmers need to pass a medium distance (1.0-3.0 km) and only 12% have to pass a low distance (0.1-0.9 km). So, it is a general picture that farmers need to travel a reasonable distance to breed their does which causes wastage of time and energy of goat rearers.

Service charge for breeding

The average service charge was found BDT 70.90±1.77 in Mymensingh district. There was significant (P<0.001) difference in service charge in different upazila (Table 6). The highest service charge was found BDT 80.50±3.80 in Muktagacha upazila and lowest service charge was found BDT 54±0.909 in Mymesnigh sadar which is shown in Table 6. The service charge was high in the rural areas of Mukhtagacha upazila due to high scarcity of breeding buck.

Table 6. Average service charge in four upazila

Upazila	Service charge in TK. (Mean ± SE)	P value	Level of significance
Mymensingh Sadar	54.00 ± 0.909		
Fulbaria	75.33 ± 3.73	<0.0001	***
Trishal	80.00 ± 2.63		
Muktagacha	80.50 ± 3.80		
Overall	70.90 ±1.77		

*** = Significant at 0.1% level (P<0.001).

Production Performances of Black Bengal goats

Body weight

The average body weights of female goat at 3 and 6 months of age were 4.67 ± 0.15 and 7.12±0.14 kg respectively which is shown in the Table 7. Body weights of goats did not significantly differ among four upazilas. Husain (1993) reported the body weight of kids at 3, 6, 9 and 12 month of age were 4.9±0.17, 8.4±0.28, 10.7±0.36 and 12.8±0.2 kg, respectively in Black Bengal goats which is almost similar with this study. Mia *et al.* (1993) reported birth weight, 6 month body weight and 12 month body weight to be 1.35, 7.69 and 11.28 kg, respectively in Black Bengal goats of Bangladesh reared in intensive farm which is also almost similar with the study. The birth weight and weight at 3, 6 and 12 month of age in Black Bengal goats to be 1.13, 5.41, 7.96 and 12.12 kg, respectively Kanaujia and Pander (1988) which is almost similar with study. In another investigation, the body weight of male and female Black Bengal goats at 3, 6, 9, 12 month were 5.08, 7.94, 10.71, 13.19 and 4.48, 7.27, 9.90, 12.47 kg, respectively.

Kid mortality rate

The average kid mortality rate from birth to 3 month was 12.88% in Mymensingh district. The highest average kid mortality rate from birth to 3 month of age was 16% in Trishal upazila and lowest kid mortality was 10.71% in Muktagacha (Table 8). Tsedeke (2007) observed that kid mortality of Arsi Bali goats under traditional system was 12.2% which is nearly similar with the study. This result is similar with the findings of Singh *et al.* (1991) who reported that average kid mortality rate was (13.04±0.05%). Chowdhury *et al.* (2002) reported that kid mortality rate were 70% which is lower than that of present study. Paul (2014) reported that average kid mortality rate of Black Bengal goat in NBF (Nucleas Breeding Flock in Bangaldesh Agricultural University) was 10±0.02% which is nearly similar with the study but lower than Modhupur and Nilphamari which were 31.03±0.05 and 28.78±0.08% respectively. Lower kid mortality rate in NBF may be due to good management practices.

Litter size

The average litter size in Black Bengal does were found 1.76±0.75 in Mymensingh district (Table 7). No significant difference in litter size was observed among the does of four upazilas. Wilson (1989) reported that the litter size of goats under research station and traditional management conditions were ranged from 1.16 to 1.57 respectively which is lower than this study. Islam *et al.* (2009) found that litter size of Black Bengal does under semi intensive and scavenging system were 2.00±0.00 and 2.33±0.33, respectively which is higher than this study. The results of the present study are similar with Choudhury *et al.* (2012) where they reported that the litter size was highest in solid black (1.67±0.54) does than Toggenburg pattern (1.56±0.45) and Brown Bezoar (1.38±0.48).

Table 7. Performance status of Black Bengal goats

Traits	Mean ± SE					P Value	Level of significance
	Overall	Sadar	Fulbaria	Trishal	Muktagacha		
Body weight at 3 month (kg)	4.67 ±0.15	4.88± 0.31	4.62± 0.38	4.52± 0.25	4.63± 0.29	0.845	Non significant
Body weight at 6 month (kg)	7.12±0.14	6.71±0.46	7.23±0.24	7.27±0.17	7.18±0.24	0.517	Non significant
Litter size	1.76±0.75	1.73±0.16	1.95±0.18	1.67±0.19	1.65±0.17	0.57	Non significant

Conclusion

The study indicates acute shortage of Black Bengal breeding bucks in the representative rural areas of Bangladesh, which may be the overall situation in the country. This scarcity gradually may reach to a severe level. Therefore, system for the production of meritorious Black Bengal breeding bucks and their distribution in the rural Bangladesh may urgently be called on.

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