Growth Performance of Black Bengal Goats in Different Regions of Bangladesh

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ABSTRACT : The growth performance in the first year of life of 892 Black Bengal kids was studied in four different locations in Bangladesh, e. g. (1) Bhabakhali, (2) Trisal, (3) Aishara and (4) Akhrail. Birth weight of kids of region 1, 2 and 3 were almost similar (1.01 kg) with significantly lower birth weight in region 4 (0.88 kg). Effect of birth type and sex were significant with higher weights for single (1.03 kg) v. twin (0.98 kg) v. triplet (0.92 kg) and male kids (1.03 kg) v. female (0.93 kg). Monthly weights of kids followed the same pattern as birth weight. Monthly weights of kids in region 1, 2 and 3 were similar with significantly lower weight for region. 4 Birth type and sex affected monthly weights in different regions where single and male kids had significantly higher weights for all the regions. The analysis of variance reveals that regional significant differences for average daily gains were noticed for the periods from birth to 3 and 9 to 12 months of age. The highest gains were noticed for region 2 (51.9 ± 2.4 kg) and the lowest for region 1 (38.2 ± 2.3 kg) with similar values for region 4. From the results it is revealed that growth performance of Black Bengal kids varied in different regions, which might be caused by inappropriate management and inadequate feed availability around the year and stressful environmental conditions.

(**Key Words**: Growth Performance, Birth Types, Parity, Goats)

INTRODUCTION

. Goats are distributed throughout Bangladesh and have an important role in generating employment, family income, capital storage and improving household nutrition. Being small in size they do not require any large management skills and can easily be handled and managed by women and children (Acharya and Battacharyya, 1992). Goats in Asia and Africa, the largest areas of concentration make their main contribution through meat and skins production although milk is also an important commodity produced. As with other countries of South East Asia, Bangladesh possesses a typical dwarf goat, the Black Bengal, with outstanding features including high fertility and fecundity. As Black Bengal goats are reared primarily for meat production, body weights and growth rates are important factors contributing productivity. The increase quantity of meat is determined principally by three factors as growth rate, live weight at slaughter and total number of goats available for slaughter (Devendra, 1985).

Very little work on the assessment of growth rates of Black Bengal goats in different regions of Bangladesh has been carried out in the past. As more than 90% of goats are mainly kept by individual farmers in the various rural areas of the country, different strategies for the improvement of this important trait may be required. The present study was initiated to evaluate the actual performance of Black Bengal goats in terms of birth weight, body weight at different stages and average daily gain during the first year of life in different regions of Bangladesh.

MATERIALS AND METHODS

The investigation was carried out in four different production locations in Bangladesh between July, 1987 and September, 1991. The four locations were Bhabakhali (1) and Trisal, (2) in the District of Mymensingh, and Aishara (3) and Akhrail (4) in the District of Tangail and Rangpur respectively. The variation of temperature and rainfall were almost same in Mymensingh and Tangail District. But in Rangpur District the temperature was much higher and in summer exceeding 40℃ while the lowest was in winter even below 5℃. The amount of rainfall was also much lower in Rangpur region. The

region 1 and 3 are situated along the bank of the river and the areas are moderately irrigated with available grazing facilities; the region 2 is in plane land having bushes and fallow lands and irrigated moderately. The region 4 has muddy and hilly soil and irrigated heavily with very less grazing facilities. Data were collected from 50 mature goats distributed to each of the four locations. Goats and kids were maintained under extensive system allowing grazing from morning to evening. Almost similar management and nutritional practices were followed for all the 4 regions. The weights of new born kids were taken as soon as the kids got cleaned and dried immediately after birth. Subsequent body weights were recorded after each 30 days from the date of birth of the individual kids and were considered as monthly weights of kids in the analysis.

The traits which are considered in the analysis were, birth weights of kids, subsequent body weights, monthly weights of kids and average daily body weight gains. The average daily body weight gains of kids for the period from birth to 3 months, 3 to 6 months, 6 to 9 months and 9 to 12 months were calculated and analysed separately for each of the period and region.

Data were analysed using GLM (General Linear Model) procedure of Harvey Mixed Model Least-Squares and Maximum Likelihood Computer package (Harvey, 1990), SAS (SAS Institute INC. 1991) and CSS (Complete Statistical System). The main effects considered in the analysis were: region, parity, litter size, sex, season and year. The facilities and expertise available under the Institute of Basic Animal Sciences, Humboldt University of Berlin, Germany, were used for the analysis of data.

RESULTS AND DISCUSSION

The growth performance was evaluated for birth weights, body weights in different periods and average daily body weight gains. The overall least-squares means (LSM) for these trial have been presented in table 1. Average daily weight gains were found to be the highest from birth to 3 months (43.29 ± 1.82 g/day) and the lowest for 9 to 12 months (23.04 ± 1.30 g/day). Average daily gains decreased significantly with the increase in age.

Table 1. Overall growth performance of black bengal kids

Trait	n	LSM	SE
Body weights (kg)			
Birth	892	0.98	± 0.01
3 months	472	4.87	± 0.07
6 months	346	8.39	± 0.28
9 months	256	10.67	± 0.36
12 months	227	12.81	± 0.20
Average daily gains (g/day)			
Birth to 3 months	472	43.29	± 1.82
3 to 6 months	346	39.50	± 1.91
6 to 9 months	256	26.48	± 1.99
9 to 12 months	227	23.04	± 1.30

Table 2. Birth weights, monthly body weights and body weight gains of kid in different regions (kg)

Traits	Bhabakhali (1)			Trisal (2)			Aishara (3)			Akhrail (4)		
	n	LSM	SE	n	LSM	SE	n	LSM	SE	n	LSM	SE
Birth weight												
Overall	263	1.00 ± .02a		235	1.01 ± .02a		149	1.02 ± .03a		245	0.88 ± .02b	
Single	75	1.06 ± .03a		64	1.09 ± .03a		29	1.04 ± .04a		119	0.91 ± .03b	
Twin	134	0.92 ± .03a		150	1.04 ± .02a		108	1.02 ± .03a		114	0.89 ± .02b	
Triplet	54	0.96 ± .03a		21	0.91 ± .05a		12	0.98 ± .06a		12	0.84 ± .06b	
Monthly weight												
3 month weight	128	4.4 ± .21a		141	5.7 ± .21b		68	5.1 ± .37c		135	4.3 ± .21a	
6 month weight	104	8.2 ± .34a		84	9.2 ± .40b		56	8.2 ± .59a		102	7.9 ± .43a	
9 month weight	104	10.6 ± .4a		55	11.5 ± .59a		40	10.9 ± .74a		57	9.7 ± .56b	
12 month weight	104	12.9 ± .24a		48	13.3 ± .34a		33	13.6 ± .56a		42	11.4 ± .37b	
Body wieght gains												
Brith to 3 month	128	38.2 ± 2.3a		141	51.9 ± 2.4b		68	44.1 ± 3.9b		135	38.9 ± 2.4a	
3 to 6 month	104	42.5 ± 2.3a		84	38.6 ± 2.7a		56	34.5 ± 3.9a		102	40.5 ± 2.7a	
6 to 9 month	104	26.2 ± 2.3a		55	27.3 ± 3.1a		40	27.9 ± 3.9a		57	24.5 ± 2.8b	
9 to 12 month	104	26.2 ± 1.5a		48	17.9 ± 2.7b		33	27.1 ± 3.5a		42	20.9 ± 2.1b	

Means with the same letter in the same row for each trait are not significantly different ($p < 0.05$).

Birth weight of kids

Birth weights of kids in different regions can be seen from the table 2. The LSANOVA indicated that the effect of region, birth type and sex are significant (p < 0.01). The birth weight was similar in regions 1, 2 and 3 with a range of 1.00 to 1.02 kg, but significantly lowest in region 4 (0.88 ± 0.02 kg). Among the different types of births, the weight of single kids in region 1, 2 and 3 were almost similar but significantly higher than region 4 (0.91 ± .03 kg). The same trend was also observed in case of twin and triplet births (table 2). Birth weight of kids obtained in this study was lower than the 1.3 kg reported by Devendra (1985) for the same breed.

Monthly body weights of kids

The LSM of body weights at 3, 6, 9 and 12 months in different regions is shown in table 2. The effect of region was significant (p < 0.01) for the weights at 3, 6 and 12 month of age. Region 2 had the highest value up to 9 months and slightly decline thereafter. Region 4 had the lowest weight throughout the periods and the trend was similar to that of birth weights in different regions. The growth pattern of kids from birth to 12 months of age in different regions can be seen from figure 1, where region 2 had the highest weight and the region 4 had the lowest. The results of this study are quite consistent with the result obtained by Singh and Sengar (1990) and Acharya (1992).
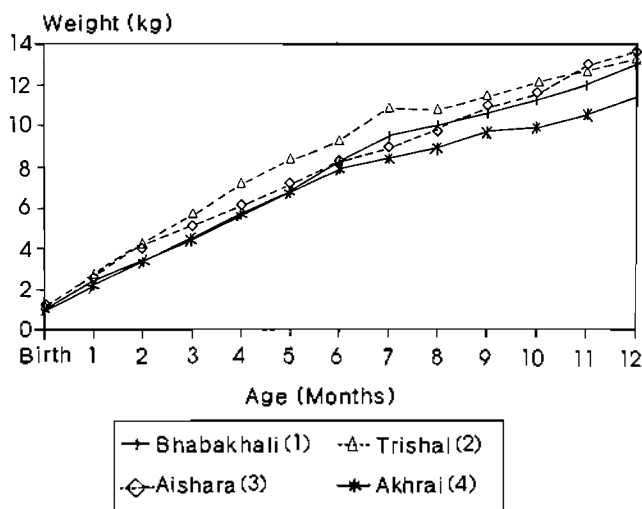

Figure 1. Growth curves of kids in different regions.

Average daily body weight gains

Ths LSM for the effect of different factors on the average daily gains for four different regions can be seen from table 2. The analysis of variance revealed that

regional differences were significant for the period from birth to 3 months and that from 9 to 12 months periods. The highest gains for the period from birth to three months were observed in region 2 (51.87 ± 2.35 g/day) and the lowest in region 1 (38.23 ± 2.30 g/day) and region 4 (38.9 ± 2.35 g/day). Daily weight gain performances of kids for the periods 3 to 6 and 6 to 9 months were similar. For the period 9 to 12 months region 3 had the highest gains (27.09 ± 3.50 g/day) and region 2 the lowest (17.90 ± 2.70 g/day). Daily gains varied significantly with age. Similar gains are found from birth to 3 months and 3 to 6 months of age but thereafter, declined sharply (figure 2). The average daily gains of kids in this study was similar to that reported by Saadullah (1991), and Khan and Singh (1989).
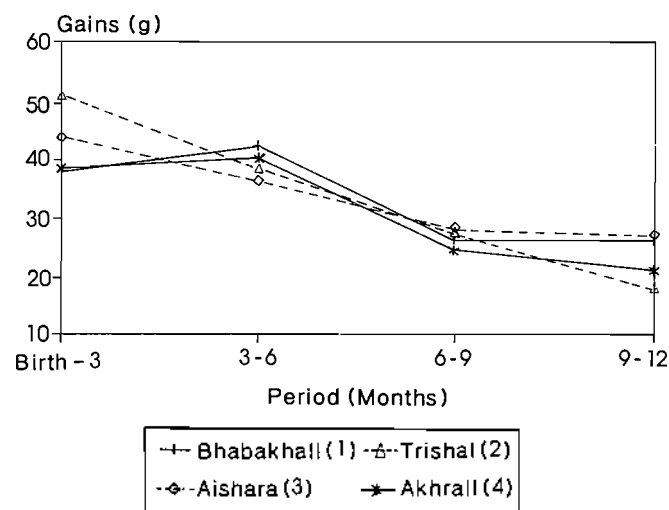

Figure 2. Average daily gains of kids in different regions.

Form the collected information it was observed that there were variations in temperature, rainfall, feed availability, grazing facilities, housing and overall managemental practices in different regions. The region 4 had extreme climatic conditions and longer drought during the experimental period that might have affected the performance, directly as well as indirectly through poor pasture availability and heat stress. These situations could be minimized through adoption of appropriate husbandry technology in the critical period of the year for maximizing production attribute.

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