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Effect of Birth Weight and Milk Yield of Dam on Kid Mortality in Black Bengal Goat

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Abstract: The experiment was conducted to find out the effect of birth weight and milk yield on kid mortality in Black Bengal goats from birth to 90 days of age. The results indicated that birth weight of kids and milk yield of does had strong relationship with mortality during the pre-weaning period. Birth weight and milk yield had significant ($P < 0.05$) effect on survivability for all the stages of growth up to 90 and 60 days of age, respectively. The kid survivability were highest and lowest having milk yield of does found to be 400-600 and 80-200 g day⁻¹, respectively. On the contrary it was also evident that survivability of kids increased from 39.8 to 90.0% with the increase of birth weight from 0.5-0.8 to 2.0-3.0 kg groups, respectively. The same trend of increased survival rate was observed when milk of does increased from 80-200 to 400-600 g day⁻¹ with corresponding in survival rate from 47.5 to 70.5%. It was concluded that birth weight of kids and milk yield of dam had a pronounced positive effect on kid mortality.

Key words: Effect, birth weight, milk yield, kid mortality, Black Bengal goat

Introduction

Bangladesh has got mainly one goat breed of its own, popularity known as the Black Bengal goat. Although, Black Bengal goat is dwarf typed but regarded as a very potential source of high quality meat and skin. The contribution of goat to the well being of humanity be given due to emphasis as it ranks second in terms of meat, milk and skin production representing about 28.0, 23.0 and 28.0%, respectively in terms of the total contribution of livestock in Bangladesh (Husain *et al.*, 1998). The higher demand of meat and skin in the local as well as foreign markets, focused goat enterprise as extremely important to the vulnerable group of people in the existing socio-economic conditions of the country (Husain *et al.*, 1998). The survivability rate and average growth potential are the two major factors for increasing meat production. This can only be made possible by creating favourable environments for improving the reproductive efficiency and reducing the unexpected rate of mortality. In the rural areas, high mortality rate of kids are regarded as the most important constraint in goat production. In respect of fertility, fecundity, prolificacy and adaptability, Black Bengal goats are found to be very famous and outstanding. But on the other hand, relatively low birth weight, slow growth rate and insufficient milk produced by the does, were identified as the major constraints directly associated with higher kid mortality and this is responsible for reduction of the total productivity. Among the factors affecting kid mortality during the pre-weaning period, birth weight was the most important. Mortality rate decreases with the increase of birth weight (Husain, 1993). High level of kid mortality represents a significant barrier

to increase productivity in goat rearing and also reduce the efficiency of production in all types of goat production enterprises (Sherman, 1987). Low birth weight, insufficient milk production of does just after kidding, lack of proper care and overall faulty husbandry practices were responsible for higher kid mortality in the prevailing production system (Husain *et al.*, 1995). Considering the above facts the experiment was undertaken to find out the effect of birth weight and milk yield on kid mortality in Black Bengal goat.

Materials and Methods

The experiment was carried out at the vicinity of Bangladesh Agricultural University from May 1996 to July 2000 under the project of goat breeding, the Department of Animal Breeding and Genetics, Bangladesh Agricultural University, Mymensingh. All the experimental kids were maintained by the farmers under their control and fed on dam's milk, grass, herbs and tree leaves. The overall management and feeding were almost similar. In the beginning of the experiment, all the goats were individually ear tagged. The sign of heat were observed in the morning, evening and does in heat were mated naturally with the buck. Separate record sheets for each of the individual doe and kids were prepared and maintained accordingly. The weight of newborn kids were taken within 6 h after kidding. The quantity of milk produced by the doe was estimated by milking the animal once in a week starting from 7th day of kidding. Milking was done in the morning keeping kids separate from the doe over the previous night. The observation for each factor was unequal. The number of animals varied from

class to class and sub-class to sub-class. Hence, it conformed to the characteristics of non-orthogonal factorial experiment. To minimize this situation the data were analyzed with General Linear Model (GLM) procedure by SAS statistical computer package (SAS Institute, INC, 1990) programme. The Least-Squares Analysis of Variance (LSANOVA) performed for all the periods and Least-Squares Means (LSM) were calculated. The SAS statistical package was used for comparative study of birth weight and milk yield of doe in relation to mortality.

Least significant Difference (LSD) test was performed to separate means in-group of significant difference among themselves according to the method described by Shil and Debnath (1995).

Results and Discussion

Birth weight of kids is considered as one of the most important contributing factors for influencing survivability. Birth weight of kids had a significant ($P<0.05$) effect on their survivability for all the period (Table 1). Birth to 7 days, survivability significantly lower in 0.5-0.8 than 0.8-2.0 kg grade. The result also showed that when kids birth weight higher than 2.0 kg survivability slightly decreased. It may be for inadequate supply of milk of dam in respect of requirement of the newborn. In other steps i.e. 8 to 15, 16 to 30 days, 31 to 60 and 61 to 90 days of life span of kids, survivability was significantly better ($P<0.05$) in higher grades of birth weight of kids. The result conclusively indicated that higher birth weight decreased mortality rate.

The effect of birth weight on survival rate is very pronounced for the period from 61 to 90 days of age. The

rate of mortality is reduced by 10% with the increase of birth weight by 2.0 to 3.0 kg which agreements with the findings of Husain (1993) and it can be suggested that the mortality rates could be decreased by improving the birth weight of kids. The present findings are in agreement with the findings of Malik, *et al.* (1990) who reported that birth weight of kids had significant effect on mortality in Black Bengal and their crossbreds. The mortality in the kids decreased with increase in birth weight. Gupta and Sengar (1985) also reported that the mortality was higher in kids of low birth weight than in heavier kids of different breeds of goats. The positive correlation coefficients (Table 1) of survivability of kids during these periods on their birth weight revealed positive linear association between birth weight of kids and their survivability.

The mortality rate decreased with increase of doe's milk yield (Table 2). The survival rate was lower with the milk yield of 80 to 200 compared to milk yield of 400 to 600 g day⁻¹ with higher survival rate. Milk yield of 300 to 400 g day⁻¹ had lower survival rate than 200 to 300 g day⁻¹ from day of birth to 15 days of age. So, milk yield had significant effect on survival rates during 16 to 30 ($P<0.05$) and 31 to 60 days of age.

It revealed that survival rate of kids were positively correlated to the milk yield of does i.e. mortality rate was negatively correlated to does milk yield. The highest mortality rates (4 and 53%) for the periods from day of birth to 7 days and 61 to 90 days of age were observed against the milk yield of 80 to 200 g day⁻¹, while the same rates were reduced to 0 to 30% against the milk yield of 400 to 600 g day⁻¹ by the does, respectively.

The present findings are in agreement with the findings of Husain *et al.* (1995) who reported that survival rate of kids

Table 1: Relationship between birth weight of kids and their subsequent survivability in different age

Kids birth weight (kg d ⁻¹)		Survivability (%)				
	n	Birth to 7 days	8 to 15 days	16 to 30 days	31 to 60 days	61 to 90 days
0.5-0.8	231	92.2 ^b	80.9 ^b	61.0 ^b	43.2 ^b	39.8 ^b
0.8-1.2	521	96.7 ^a	95.3 ^a	92.1 ^a	87.9 ^a	85.4 ^a
1.2-2.0	310	98.3 ^a	97.7 ^a	95.8 ^a	93.5 ^a	90.4 ^a
2.0-3.0	20	95.0 ^{ab}	95.0 ^a	95.0 ^a	90.0 ^a	90.0 ^a
Correlation coefficient		0.31	0.61	0.69	0.66	0.69

Table 2: Relationship between milk yield of does and subsequent survivability (%) of their kids in different age

Dams milk yield (gd ⁻¹)	n	Birth to 7 days	8 to 15 days	16 to 30 days	31 to 60 days	61 to 90 days
80-200	80	96.20	88.70	58.70 ^b	47.50 ^c	47.50
200-300	54	100.00	94.40	72.20 ^b	57.40 ^{bc}	55.50
300-400	24	95.80	87.50	75.00 ^{ab}	70.80 ^b	54.10
400-600	17	100.00	100.00	94.10 ^a	94.10 ^a	70.50
Correlation coefficient		0.45	0.67	0.98	0.99	0.93

Means with uncommon superscript(s) in the same column differ significantly ($P<0.05$).

n = initial number of observation.

were positively correlated to the milk yield of dams. The mortality rate were 19.0 and 43.1% with an average milk yield of 37.9 g day⁻¹ for period from birth to 1 and birth to 3 months of age. Whereas, for the same period average milk yield 369.9 g day⁻¹ mortality rates decreased to 3.9 and 11.8%.

Milk production potential of Black Bengal goats are very negligible. It was alarming that about 30% does after kidding produced very little or no milk even for feeding their kids (Husain, 1993). Milk production is obviously an important part of mothering ability. Mothering ability is a complex feature closely associated with the survival of kids and greatly affected does ability to feed, shelter and perhaps protect the kid from predators (Dalton, 1981). Furthermore, those who have poor mothering instincts, show less interest for their offspring and this affects the growth and survival adversely. Milk production mainly influenced by size of doe and availability of natural feed resources. Acute shortage of feed few weeks before and after parturition severely affects the milk production ability of does and it finally affects kid survival (Husain, 1993).

It is concluded that birth weight of kids and milk yield of does have got a very pronounced effect on kid survivability. This records that selection for the improvement of birth weight, milk yield and growth rate could improve survivability status of kids especially during the pre-weaning period. So emphasis should be given to the improvement of birth weight of kids and milk producing ability of does which will in turn reduce the kid mortality to a greater extend and ultimately increase the total productivity in Black Bengal goats.

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