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STUDY ON THE BIRTH WEIGHT AND GESTATION LENGTH OF NILI, INDIGENOUS AND THEIR CROSSES AT BUFFALO BREEDING AND DEVELOPMENT FARM, BAGERHAT

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Abstract: The study was conducted using the data collected from Buffalo Breeding and Development Farm, Bagerhat. Data covered the period from 1986 to 2000. Three hundred and thirty seven buffalo calves and sixty one buffalo cows of three genetic groups were considered for analysis of two traits, birth weight and gestation period, respectively. The genetic groups considered in the study were pure Nili, indigenous, 50% Nili 50% indigenous and 75% Nili 25% indigenous. Data were analyzed by Statistical Package for Social Sciences (SPSS) computer program. From the study, it was found that 75% Nili calves had greater birth weight (34.10 ± 2.74 kg) compared to pure Nili (33.20 ± 0.32 kg) and 50% Nili crosses (30.67 ± 3.86 kg). The gestation length of indigenous group was lower (303.04 ± 2.17 days) compared to Nili buffalo cows (309.43 ± 4.36 days). The effect of genetic groups on birth weight was significant ($P<0.001$) and that was insignificant ($P>0.05$) for gestation period.

Key words: Birth weight, Gestation period, Indigenous, Nili, Cross-bred Buffalo.

Introduction

In Bangladesh, there are 1.18 million heads of buffalo (FAO, 1992). The buffaloes of Bangladesh are either indigenous or migrated from India or Myanmar (Faruque and Amin, 1994). At the starting stages of the Bagerhat Buffalo Breeding and Development Farm, Nili and Murrah buffaloes were introduced from Pakistan. Indigenous buffaloes were also kept at the farm.

For the improvement of draught capacity as well as milk production of buffaloes at coastal belt, the farm was established with the aim to disseminate the exotic blood through the bulls maintained at the farm. Indigenous buffaloes are superior to cattle in the sense that they produce two times more milk having more fat and solids not fat (SNF) (Hussen, 1990). They possess more draught capacity and can utilize poor quality roughages very well. In spite of greater importance of buffaloes in the economy of Bangladesh, very little emphasis was given regarding proper selection and breeding program. There is a positive relationship between the birth weight and rate of weight gain, age at puberty and mature body weight (Hafez, 1987). The study was undertaken with the following objectives: (1) to identify the effect of genetic groups on their birth weight, (2) to observe the relationship between gestation length and different breeds of buffalo and (3) to suggest the methods of improving the birth weight of buffalo calves through proper breeding.

Materials and Method

Experimental Animals and their management: Three hundred and thirty seven newborn buffalo calves and sixty one buffalo cows were considered for studying birth weight and gestation length, respectively.

Table 1: The number of animals of different groups of buffalo

Traits	*Nili*	*Cross*		*Indigenous*	*Total*
		50% Nili- 50% Indigenous	75% Nili-25% Indigenous		
Birth weight (kg)	121	150	66	0	337
Gestation length (days)	14	0	0	47	61

Buffaloes were allowed to graze in the field with para, dahl and natural grasses until noon. They were also provided with concentrate mixture consisting of wheat bran/rice bran, oil cake and salt. The quantity of concentrate feed allocation varied depending on sex, age and use of animals. Records of the traits of buffaloes were maintained at the farm and birth weights of calves were being taken by balance objectively. The buffaloes were individually identified using ear tags.

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Data used: Information from the record register for birth weight and gestation length was collected covering a period from 1986-2000. The genetic groups considered in the study were pure Nili, Indigenous, 50% Nili - 50% Indigenous and 75% Nili - 25% Indigenous.

Birth weight: Birth weight of calves was measured after birth by weighting the calves and was recorded in kilogram.

Gestation length: Gestation length was calculated on the basis of interval from fertile service to parturition. Gestation length varies according to breed and environment and appears to be slightly longer than cattle.

Design of experiment: Available data on birth weight and gestation length were employed in this study. The data covered three different genetic groups where the numbers of animals in three groups were unequal. Data were analyzed using the SPSS computer program for analysis of variances with unequal sample sizes. Least Significant Difference (LSD) was done to differentiate the genetic groups' means.

Results and Discussion

Birth Weight: Overall mean birth weight of buffalo calves was found 32.25 ± 0.21kg. The average birth weight of Nili, 50% Nili-50% Indigenous and 75% Nili-25% Indigenous were 33.20 ± 0.32 kg, 30.67± 3.86kg and 34.10± 2.74 kg respectively (Table 2). The maximum and minimum value of birth weight for Nili, 50% Nili crosses and 75% Nili crosses were within the range of 45-22 kg, 40- 21 kg and 45-29 kg, respectively.

Table 2: Least- squares means with standard error of birth weight and gestation length of different genetic groups

Traits	*Nili*	*Crosses*		*Indigenous*	*Overall mean*
		50% Nili-50% Indigenous	75% Nili-25% Indigenous		
Birth weight (kg)	$33.20^{a} \pm 0.32$	$30.67^{b} \pm 3.86$	$34.10^{a} \pm 2.74$	_	32.25±0.21
Gestation length (day)	309.43 ± 4.36	_	_	303.04±2.17	304.51±1.96

Means with uncommon superscripts within same row differ significantly (P<0.05).

Table 3: Effect of genetic groups on birth weight and gestation length

Traits	*F-value*	*Level of significance*
Birth weight	27.859	***
Gestation length	1.900	NS

*** = P< 0.001, NS = Non-significant

The least-squares analysis of variance showed that the genetic group had highly significant effect (P<0.001) on the birth weight (Table 3). In the present study the birth weight of Nili, 50% Nili-50% Indigenous, 75% Nili 25% Indigenous calves were more or less similar to the findings of Chiangmai, *et al.* (1998). The authors reported that the birth weight of Thailand buffalo was 31.20±6.17 kg and Surine buffalo was 29.85 ± 5.09 kg. Khan (1995) observed that the average birth weight of Nili–Ravi and graded (Nili-Ravi × Indigenous) were 32.76±0.80kg, 28.50±0.79kg respectively. Faruque and Amin (1995) mentioned that the birth weight of Indigenous buffalo in the coastal area was within the range of 18kg to 26kg. Abeygunawardena *et al.* (1995) mentioned that the average birth weight of Surti, Murrah, Nili-Ravi and Lankan buffaloes were 27.10kg, 27.60kg, 30.10kg and 17.90kg respectively. Monogon (1994), observed that the birth weight of crossbred of Murrah and Nili-Ravi with their Philippine Carabo's was about 35±1.0 kg. Faruque and Amin (1994) mentioned that the average birth weight of Indigenous buffaloes of the coastal area of Bangladesh was 22.00 ± 3.50kg. On the other hand, Hussen (1990) reported the average birth weight of buffaloes of Tangail districts was 26.74 ± 2.4kg. Faruque (1994) found that the birth weight of Indigenous buffaloes in Mymensingh district was 24.75 ± 2.12kg. The higher mean of crossbred calves at Buffalo Breeding and Development Farm might be due to heterosis arising from the crosses between Nili and Indigenous.

Gestation length: Overall mean of gestation length was 304.51± 1.96 days and gestation length of Nili and Indigenous were 309.43 ± 4.36 and 303.04 ± 2.17 days respectively. The least square analysis reveals that the genetic groups were insignificant (P>0.05) for this trait. The findings of present study were almost similar to findings of Joshi *et al.* (1968). They found the average gestation length of Indian buffaloes was

308.1 days. The gestation length in farm breed and purchased buffaloes in India was found 314 ± 1.53 and 308±1.83 days (Singh, *et al.*, 1973) and that for in Surti buffaloes was 307.15±0.63 days (Patel and Kodagali, 1984). The gestation length of Nili-Ravi was found 308.7±0.4 days in Pakistan (Usmani, 1987). Khan (1995) mentioned that the average gestation length of Nili-Ravi and crossbreed buffalo cows were 302.67±1.90 and 300.67±3.55 days, respectively. Chantalakhana (1979) reported that Thailand Murrah and Taiwan Swamp breeds had a mean gestation length of 308 days and 315 days respectively. Faruque and Amin (1995) observed that the gestation length of Indigenous buffalo calves in Khulna division was 308± 5.4 days.

Conclusion

Indigenous buffaloes are superior to cattle in the sense that they are more productive for both milk and draught out put. There is a possibility to improve their performances by upgrading with exotic breeds. Since the birth weights of Nili, and 75% Nili crosses were higher than other genetic groups, therefore, it would be better to upgrade Indigenous buffaloes with Nili bulls to improve birth weight of buffaloes in Bagerhat aspect.

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