OnLine Journal of Biological Sciences 1 (11): 1085-1087, 2001

Productive and Reproductive Performances of Native Cows under Farm Conditions

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Abstract: Data in five parities of native cows were evaluated for per day milk yield, lactation length, birth weight of calves, post partum heat period, period of calving to conception, gestation length, calving interval and number of service per conception (nos.). Per day milk yield ranged from 2.23 ± 0.48 to 2.62 ± 0.43 liters in different parities. Likewise, lactation length and birth weight of calves ranged from 230.58 ± 69.51 to 266.96 ± 78.91 days and 20.44 ± 3.15 to 21.88 ± 3.19 kg, respectively among different parities. Post partum heat period and period of calving to conception ranged from 133.40 ± 52.61 to 158.68 ± 107.50 days and 162.16 ± 72.49 to 212.88 ± 125.50 days, respectively in different parities. Amongst the parity differences post partum heat period and period of calving to conception were not found to be significant. The mean gestation period during the fifth parity was shorter ($p < 0.05$) than the first and second parities (274.50 vs 279.36 and 279.08 days, respectively). Calving interval and number of service per conception ranged from 445.44 ± 75.04 to 487.40 ± 130.36 days and 1.48 ± 0.77 to 1.88 ± 0.10 numbers, respectively over the parities. But there was no difference on the parameters like calving interval and number of service per conception over the parities.

Key words: Native cows, lactation length, calving interval

Introduction

Cattle of Bangladesh is an inseparable and integrated part of the agricultural and it ranks twelfth in cattle population in the world and in the Asian countries its position is third but it yields only 21 per cent of the world's milk production and 34 per cent of the beef production (Alam *et al.*, 1994; Rahman, 1992). In Bangladesh the livestock population consisted of 23.6 million cattle (FAO, 1997). Despite these large cattle population in the country, the output of milk falls short of requirement. The average milk of indigenous dairy cows are only 137 liters per lactation (DLS, 1991). This low productivity of the native cows is mainly due to poor genetic potentials and limited feed resources particularly during winter and early spring. But on the other hand, it is important to note that prevailing environment condition is not suitable for raising high productive exotic breeds.

Cattle plays a vital role as dual (Drought and milk) purpose animal in Bangladesh. It is generally assumed that the productivity of native cattle is very low. An important program has been taken by the Govt. through Artificial Insemination (A.I.) program using different crossbred bulls throughout the country. Hence central Cattle Breeding Station, Savar, Dhaka, maintaining the native cows to produced these crossbred bulls. Unfortunately no attempt has yet been taken to know the performance of these native cows in farm condition. Not much information is available about the performance of these native cattle in the country (Ghose *et al.*, 1977). Prior to planning any breeding program for improvement of native cattle it is of prime consideration to know the actual productive and reproductive performance of these cattle and to identify the actual causes of low productivity of these native cattle.

Therefore, this study was undertaken to determine the actual productive and reproductive performance of native cows under farm conditions and if found low to determine their causes.

Materials and Methods

The study was conducted at Central Cattle Breeding Station (CCBS), Savar, Dhaka. The data were collected from the farm records maintained during the period 1991-1998. The cows used in this study were indigenous i.e., native cows. The indigenous cows are Zebu (*Bos indicus*) type, small in size and produce poor milk even under good dietary and management conditions, poor weight gain purchased from local markets in pregnant condition during 1990 and 1992. Hence the parameters on the productive performance covered the first to fifth lactation stages. The cows were inseminated artificially with different strains of Holstein-Friesian maintained at CCBS, whenever they come into heat, except during the first pregnancy. Data from only healthy cows which are kept under stall feeding system and supplied with green grass and locally available feed ingredients (wheat bran, rice polish, khesari bran, oil cake, etc.) according to their body requirements as per ARC recommendations. The cows were milked twice daily, one at 4 a.m. (early morning) and the other at 3 p.m. (afternoon) using hand milking system. Data obtained in this study were analyzed by analysis of variance after(Steel and Torrie, 1980) using the completely randomized design (CRD). Kramer (1956) modification of duncan multiple range test (DMRT) was used for test of significance of means with unequal subclass number.

Results

Productive performance: The means of different productive parameters are presented in Table 1. The mean per day milk yield was 2.43, 2.62, 2.25, 2.40 and 2.23 liters in first, second, third, fourth and fifth lactation stages respectively and showed no difference on production in different lactation stages. The mean lactation lengths in first, second, third, fourth and fifth lactation were 253.79, 233.54, 266.96, 259.70 and 230.58 days respectively. There were no differences among lactation length in different lactation stages. The mean birth weight of calf was 20.92, 20.96, 21.88, 20.75 and 20.44 kg in first, second, third, fourth and fifth parity respectively and showed no difference on birth weight in different parities.

Reproductive performance: The means of different reproductive parameters are presented in Table 2. The post partum heat period in second, third, fourth and fifth parity were 158.68, 146.48, 138.40 and 133.76 days respectively. Parity numbers had no significant effect on post partum heat period of native cows. The mean period of calving to conception in second, third, fourth and fifth parity were

Table 1: Mean ± SD of productive performance of native cows at Savar Dairy Farm (SDF)

Parameters	First lactation (Mean, SD)	Second lactation (Mean, SD)	Third lactation (Mean, SD)	Fourth lactation (Mean, SD)	Fifth lactation (Mean, SD)
Per day milk yield(liters)	2.43±0.701 (24)	2.62±0.511 (24)	2.25±0.511 (24)	2.40±0.631 (24)	2.23±0.477 (12)
Lactation length (days)	253.79 ±78.955 (24)	233.54 ±64.9378 (24)	266.96 ±78.912(24)	259.70 ±48.649(20)	230.58 ±69.507(12)
Birth weight of calves (kg)	20.92±4.192 (25)	20.96±2.791 (25)	21.88±3.193 (25)	20.75±3.404 (24)	20.44±3.148 (18)

Parentheses indicates the total number of observation

Table 2: Mean ± SD of reproductive performance of native cows at Savar Dairy Farm (SDF)

Parameters	Second parity	Third parity	Fourth parity	Fifth parity
Post partum heat period (days)	158.68±107.479 (24)	146.48±1235.437 (25)	138.40±52.613 (25)	133.76±70.404 (25)
Period of calving to conception (days)	196.80±112.018 (25)	198.12±124.691 (25)	162.16±72.485 (25)	212.88±125.498 (25)
Gestation length (days)	279.36b±4.202 (25)	279.08b±6.027 (25)	277.88ab±5.364 (25)	274.50a±11.398 (180)
Calving interval (days)	477.92±113.972 (25)	474.88±123.883 (25)	445.44±75.036 (25)	487.40±130.359 (25)
Number of service per conception (nos.)	1.48±0.770 (25)	1.88±1.013 (25)	1.52±0.823 (25)	1.88 ±0.992(24)

Mean value in a raw with different superscripts differ significantly, ($p < 0.05$) Parentheses indicate the total number of observation
SD: = Standard deviation

196.80, 198.12, 162.16 and 212.88 days respectively. There were no differences among period of calving to conception in different parities as in case of post partum heat period as reported earlier. The mean gestation lengths during the fifth parity was shorter ($p < 0.05$) than second and third parities (274.50 vs 279.36 and 279.08 days). The mean calving interval were 477.92, 474.88, 445.44 and 487.40 days respectively in second, third, fourth and fifth parities. Parity numbers had no significant effect on calving interval of native cows. This trait is related with period of calving to conception longer the calving interval. The mean number of services per conception were 1.48, 1.88, 1.52 and 1.88 respectively in second, third, fourth and fifth parity showed no differences among different parities.

Discussion

Productive performance: The lactation length decreased with the progress in lactation stages except the case of second lactation length. This may be due to that, in the case of post partum heat period and with the proceedings of lactation stages the heat was longer and intense thus easier to inseminate timely that reduce the lactation length. Though, the lactation length was longer in the first lactation stage, but it is found that per day milk yield was lower in this stage than second lactation this may be due to later part of the lactation. The birth weight of calves was relatively lower than European cattle. This may be due to that the cows used in this study were Zebu type.

Reproductive performance: Post partum heat period is a very important economic reproductive trait in a dairy herd. As the post partum heat period is short, the cow is impregnated earlier and the calf crop is also coming earlier. Hafez (1993) suggested the post partum breeding should be delayed up to 60-90 days after parturition, when the estrous undergoes recovery and preparation for the next pregnancy. For achieving maximum number of parturition in life time, the cows should be cycle within 60-80 days post-partum (Alam, 1988). The present study showed a mean range from 133.76 to 158.68 days. This may be due to inefficient or inaccurate detection of estrous as reported by Hawk (1979). The period gradually decreased with an increased in parity. This may be due to the cows brought from local markets having poor nutritional status and gradually with the cumulative effect of nutrition in farm condition intensified and longer the heat period with increased parity and thus it is easier to detect heat to inseminate in time. Dobson and Alam (1987) also stated that level of nutrition directly affect the growth of ovarian follicles and steroid release. No differences among periods of calving to conception in different parities may be due to the wrong time of insemination in relation to actual heat. Kiddy (1979) reported that as 20% of cows reported for insemination are not really in estrous. He also reported that careful observation of cows by knowledgeable personnel is necessary for a successful breeding program.

The post partum heat period and the period of calving to conception were closer to the findings of Nahar *et al.* (1995) and Khan *et al.* (1999). The mean gestation period was closer to the findings of Nahar *et al.* (1995), Ghose *et al.* (1977) and Khan *et al.* (1999). The calving interval is related with the period of calving to conception and the longer the period of calving to conception longer the calving interval. Hawk (1979) also reported that the calving interval can be shortened with the accurate detection of estrous. It is also important to note that the optimum calving interval is about 360 days and deviations from this reduce the potential income per cow (Britt, 1975). The present study showed longer calving interval than optimal, it may be due to management factors. The mean calving interval was closer to the findings of Nahar *et al.* (1995) and Khan *et al.* (1999). Many workers (Payne, 1970; Jarpa, 1979; Nahar *et al.*, 1995; Khan *et al.*, 1998; Khan *et al.*, 1999) reported service per conception to be ranged from 1.20 to 1.81. The observed service per conception of this study fall within the range of mean values to what other workers observed.

In the present study it may be concluded that longer post partum heat period, calving to conception, calving interval and

shorter lactation length, per day milk yield and birth weight of calves. In addition the cows were Zebu type and the managemental problem associated with inaccurate heat detection, environmental factors, etc. The performance in respect to production and reproduction of indigenous local cows are almost similar results amongst the different parities.

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