

## PERFORMANCE OF NATIVE COWS UNDER FARM CONDITIONS

T. N. Nahar, M. R. Islam, M. S. Zaman and S. S. Kibria

Animal Production Research Division, Bangladesh Livestock Research Institute, Savar, Dhaka 1341, Bangladesh

### Summary

Data on productive and reproductive performance of native cows maintained at Savar Dairy Farm, Central Cattle Breeding Station (CCBS), Savar, Dhaka, were collected from the periods of 1980-1988. The mean calving to first breeding during the second parity was longer ( $p < 0.01$ ) than the fourth and fifth parities (152 vs 105 and 96 days respectively). There was no difference on the parameters like first breeding to conception, service period, gestation length, number of services per conception and total milk yield over the parities. The mean calving interval during the second parity was longer ( $p < 0.05$ ) than the fourth and fifth parities. The mean lactation length during the first parity was longer ( $p < 0.01$ ) than those of second, third, fourth and fifth lactations (317 vs 237, 266, 250 and 247 days respectively). The mean per day milk yield during the first lactation was lower ( $p < 0.01$ ) than those of second, third, fourth and fifth lactations (1.88 vs 2.55, 2.75, 2.54 and 2.57 kg respectively). The mean dry period was longer in first lactation ( $p < 0.05$ ) compared to third and fifth lactations (209 vs 141 and 129 days respectively).

**(Key Words :** Native Cows, Reproductive Performance, Productive Performance, Farm Conditions)

### Introduction

Cattle plays a vital role as dual (Drought and milk) purpose animal in Bangladesh. But it is generally assumed that the productivity of our native cattle is very low. An improvement program has been taken by the Govt. through Artificial Insemination (A.I) program using different crossbred bulls throughout the country. Hence Central 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. Again 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

Data on productive and reproductive performance of native cows were collected from records maintained at Central Cattle Breeding Station (CCBS), Savar, Dhaka, covering the periods from 1980-1988. 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 and they are late maturing. The cows included in this study were purchased from local markets in pregnant condition during 1980 and 1982. Hence the parameters on the productive performance covered the first to fifth lactation and that of reproductive performance covered the second to fifth lactation stages. The service period was divided into two components: calving to first breeding and first breeding to conception. The cows were inseminated artificially with different strains of Holstein-Friesian maintained at CCBS, whenever they come into heat, except during the first pregnancy. The cows were kept in confinement. During this period these cows were allowed to 1 kg rice straw and 12 to 15 kg green grass (Napier or Para or Maize) per head per day. In addition, 3 kg concentrates containing 13 to 17% crude protein were also allowed to each cow a day. Data obtained in this study were analysed using Completely Randomized Design (CRD). Kramers (1956)

---

Address reprint requests to Dr. T. N. Nahar, Animal Production Research Division, Bangladesh Livestock Research Institute, Savar, Dhaka 1341, Bangladesh.

Received August 23, 1994

Accepted December 16, 1994

modification of Duncans Multiple Range Test (DMRT) was used for test of significance of means with unequal subclass number.

## Results

### Reproductive performance

The means of different reproductive parameters are presented in table 1. The mean calving to first breeding during the second parity was longer ( $p < 0.01$ ) than fourth and fifth parities (151.97 vs 104.77 and 95.97 days). The mean period of first breeding to conception in second, third, fourth and fifth parity were 107.51, 44.57, 75.13 and 50.57 days respectively. The mean service

periods in second, third, fourth and fifth parity were 233.86, 177.76, 208.84 and 173.57 days respectively. There were no differences among service period in different parities as in case of first breeding to conception as reported earlier. The mean gestation lengths were 271.03, 273.73, 279.0 and 268.46 days respectively in second, third, fourth and fifth parities. The calving interval during the second parity was longer ( $p < 0.05$ ) than the fourth and fifth parities (508.6 vs 433.8 and 419.6 days). This trait is related with service period and the longer the service period longer the calving interval. The mean number of services per conception were 1.78, 1.59, 1.8 and 1.69 respectively in second, third, fourth and fifth parity showed no differences among different parities.

TABLE 1. MEAN  $\pm$  SE OF REPRODUCTIVE PERFORMANCE OF NATIVE COWS AT SAVAR DAIRY FARM (SDF)

Parameters	2nd parity	3rd parity	4th parity	5th parity
Calving to first breeding (days)	151.97 <sup>c</sup> $\pm$ 14.44(37)	127.66 <sup>bc</sup> $\pm$ 10.22(37)	104.77 <sup>ab</sup> $\pm$ 8.40(31)	95.97 <sup>a</sup> $\pm$ 11.09(28)
First breeding to conception (days)	107.51 <sup>a</sup> $\pm$ 18.61(37)	44.57 <sup>a</sup> $\pm$ 13.20(37)	75.13 <sup>a</sup> $\pm$ 46.14(31)	50.57 <sup>a</sup> $\pm$ 15.18(28)
Service period (days)	233.86 <sup>a</sup> $\pm$ 30.20(37)	177.76 <sup>a</sup> $\pm$ 16.22(37)	208.84 <sup>a</sup> $\pm$ 51.75(31)	173.57 <sup>a</sup> $\pm$ 21.27(28)
Gestation length (days)	271.03 <sup>a</sup> $\pm$ 0(37)	273.73 <sup>a</sup> $\pm$ 28.3(37)	279.0 <sup>a</sup> $\pm$ 7.21(31)	268.46 $\pm$ 3.55(28)
Calving interval (days)	508.59 <sup>b</sup> $\pm$ 31.16(37)	448.14 <sup>bc</sup> $\pm$ 16.09(37)	433.84 <sup>c</sup> $\pm$ 19.33(31)	419.57 <sup>a</sup> $\pm$ 23.06(28)
Number of service per conception (nos.)	1.78 <sup>a</sup> $\pm$ 0.17(37)	1.59 <sup>a</sup> $\pm$ 0.14(37)	1.8 <sup>a</sup> $\pm$ 0.19(31)	1.69 <sup>a</sup> $\pm$ 0.19(28)

<sup>abcd</sup> Means with different superscripts in the same row differ significantly ( $p < 0.01$  or  $p < 0.05$ ). Parentheses indicate the total number of observation.

### Productive performance

The means of different productive parameters are presented in table 2. The mean lactation lengths were 317.41, 236.62, 265.91, 255.94 and 247.35 days respectively in first, second, third, fourth and fifth lactations. The first lactation was longer ( $p < 0.01$ ) than those of other lactation stages and it was found that with the progress of lactation stages, the lactation length decreased except the case of second lactation length. The mean total milk yield was 613.43, 608.22, 715.58, 628.14 and 642.49 kg in first, second, third, fourth and fifth parity respectively and showed no difference on production in different lactation stages. The mean per day milk yield was lower ( $p < 0.01$ ) in first lactation than during of second, third, fourth and fifth lactation stages (1.88 vs 2.55, 2.75, 2.54 and 2.57 kg). The dry period in the first lactation stage was longer than third and fifth lactation stages (208.86 vs 184.84 and 128.88 days).

## Discussion

### Reproductive performance

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 95.97 to 151.97 days. This may be due to inefficient or inaccurate detection of estrus 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. The large variation in first breeding to conception in different parities may have

TABLE 2. MEAN  $\pm$  SE OF PRODUCTIVE PERFORMANCE OF NATIVE COWS AT SAVAR DAIRY FARM (SDF)

Parameters	1st lactation	2nd lactation	3rd lactation	4th lactation	5th lactation
Lactation length (days)	317.41 <sup>a</sup> $\pm$ 15.15 (37)	236.62 <sup>b</sup> $\pm$ 15.83 (37)	265.91 <sup>b</sup> $\pm$ 12.97 (35)	255.97 <sup>b</sup> $\pm$ 12.97 (29)	247.35 <sup>b</sup> $\pm$ 11.53 (28)
Total milk yield (kg)	613.43 <sup>a</sup> $\pm$ 47.45 (37)	608.22 <sup>a</sup> $\pm$ 55.0 (37)	715.58 <sup>a</sup> $\pm$ 62.8 (35)	628.14 <sup>a</sup> $\pm$ 38.27 (29)	642.49 <sup>a</sup> $\pm$ 41.34 (28)
Per day milk yield (kg)	1.88 <sup>a</sup> $\pm$ 0.10 (37)	2.55 <sup>a</sup> $\pm$ 0.12 (37)	2.75 <sup>a</sup> $\pm$ 0.11 (35)	2.54 <sup>a</sup> $\pm$ 0.09 (29)	2.57 <sup>a</sup> $\pm$ 0.16 (28)
Dry period (days)	208.86 <sup>c</sup> $\pm$ 26.69 (37)	184.84 <sup>cd</sup> $\pm$ 11.66 (37)	141.26 <sup>d</sup> $\pm$ 18.25 (35)	169.10 <sup>cd</sup> $\pm$ 24.06 (29)	128.88 <sup>d</sup> $\pm$ 10.30 (28)

<sup>abcd</sup> Means with different superscripts in the same row differ significantly ( $p < 0.01$  or  $p < 0.05$ ).

Parentheses indicate the total number of observation.

resulted in difference between and among parities. No differences among service periods 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 estrus. He also reported that careful observation of cows by knowledgeable personnel are necessary for a successful breeding program. The mean gestation period was closer to the finding of Ghosh et al. (1977). The calving interval is related with service period and the longer the service period longer the calving interval. Hawk (1979) also reported that the calving interval can be shortened with the accurate detection of estrus. 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.

### Productive performance

The lactation length decreased with the progress of lactation stages except the case of second lactation length. This may be due to that, in the case of calving to first breeding 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 this may be due to later part of the lactation. The optimum dry period is about 60 days for 305 days of lactation length in European cattle. But the dry period ranges from 128.88 to 208.86. This may be due to that the cows used in this study were Zebu type.

In the present study it may be concluded that longer period of calving to first breeding, calving interval, and

dry period and shorter lactation length, total milk yield and per day milk yield. In addition the cows were Zebu type, and the managerial problem associated with inaccurate heat detection, environmental factors, etc.

### Literature Cited

- Alam, M. G. S. 1988. Studies on current reproductive status with special emphasis on endocrine disorders in cow. Paper presented at the annual workshop held at Bangladesh Agricultural Research Council, Farmgate, Dhaka, Bangladesh.
- Britt, J. H. 1975. Early post-partum Breeding in dairy cows. A Review. *J. Dairy Sci.* 60:1125-1132.
- Dobson, H. and M. G. S. Alam. 1987. Preliminary investigation into the endocrine systems of subfertile cattle: location of a common lesion (rate limiting step). *J. Endocr.* 113:167-171.
- Ghose, S. C., M. Haque, M. Rahman and M. Saadullah, 1977. A comparative study of age at first calving, gestation period and calving interval of different breeds of cattle. *Bang. Vet. Jour.* 11(1-4):9-14.
- Hawk, H. W. 1979. Infertility in dairy cattle. In: *Animal Reproduction (BARC symposium number 3-Harold Hawk ed)*. Allanheld. Osmum. Montclair.
- Kiddy, C. A. 1979. Estrus detection in dairy cattle. In: *Animal Reproduction (BARC Symposium number 3-Harold Hawk ed)*. Allanheld. Osmum. Montclair.
- Kramer, C. Y. 1956. Extension of multiple range test to group means with unequal numbers of replication. *Biometrics* 12:307-310.
- Steel, R. G. D. and J. H. Torrie. 1980. Principles and procedures of Statistics. Mc. Graw-Hill Book Co. New York.

