

## Productive and reproductive performance of dairy cattle in Char areas of Bangladesh

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### Abstract

Production traits of 60 indigenous (*Desi*), 20 Friesian × *Desi* and 20 Sahiwal × *Desi* cows were recorded in six *char* villages of Sariakandi upazila (Sub-district) of Bogra district. The mean ( $\pm$  SD) daily milk yields were  $1.7 \pm 0.6$ ,  $6.3 \pm 1.2$  and  $5.1 \pm 1.0$  litres, respectively. The lactation lengths, ages at puberty, gestation lengths, calving intervals, numbers of services per conception, intervals between calving and first oestrus were  $217.9 \pm 18.7$ ,  $253.8 \pm 21.9$ ,  $240.8 \pm 15.7$  days;  $27.4 \pm 2.7$ ,  $23.9 \pm 2.0$ ,  $26.2 \pm 2.4$  months;  $277.4 \pm 4.2$ ,  $278.3 \pm 4.2$ ,  $278.3 \pm 4.0$  days;  $494.8 \pm 27.3$ ,  $487.5 \pm 17.4$ ,  $493.3 \pm 16.2$  days;  $1.3 \pm 0.5$ ,  $1.7 \pm 0.6$ ,  $1.6 \pm 0.5$ ;  $145.6 \pm 27.4$ ,  $166.8 \pm 33.0$  and  $170.5 \pm 34.9$  days, respectively. Daily milk yield and lactation length were significantly ( $p < 0.01$ ) better for cross-bred cows than for *Desi*, and age at puberty was significantly ( $p < 0.01$ ) better for Friesian-cross cows than for *Desi*, while number of services per pregnancy and onset of post partum oestrus were significantly ( $p < 0.01$ ) better for *Desi* than for cross-bred cows. There were no significant differences in gestation length and calving interval. It is suggested that the overall productive and reproductive performance of Friesian × *Desi* and Sahiwal × *Desi* cows were better than those of *Desi* cows. (*Bangl. vet.* 2008. Vol. 25, No. 2, 68-74)

### Introduction

*Chars* are low-lying areas prone to flood and erosion in or adjacent to major rivers. About 80% of the poor and 36% of ultra-poor people in *chars* rear livestock as a major means of livelihood (Hodson, 2006; Howes, 2006). However, the productivity of cattle is low because of poor genetics, nutrition, herd health and management. Khan *et al.* (1999) reported that the cattle in Bangladesh are mostly of indigenous type (*Bos indicus*) with a few crossbreds, and some pure dairy zebu and European breeds such as Sahiwal, Sindhi and Holstein-Friesian. The very poor people living in the *char* areas of northern Bangladesh keep a significant number of unproductive cows, and are unable to ensure food security. It is imperative to improve productivity in order to increase food production and alleviate poverty.

There is paucity of information about productive and reproductive performance of dairy cattle in the *chars* in Bogra district. Comprehensive reports on productive potentials of *Desi* and crossbred cattle under various management conditions in

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Bangladesh are lacking (Alam and Ghosh, 1988; Nahar *et al.* 1989; Shamsuddin *et al.*, 1988, 1995; Khan *et al.*, 2001; Sarder, 2004; Rahman and Rahman, 2006). Prior to introduction of a crossbreeding programme for upgrading these cattle, it is essential to know the present production.

This study was undertaken to determine the productive and reproductive status of cattle in selected *chars* of Bogra district.

## Materials and Methods

The study was conducted in six *char* villages of Sariakandi upazila of Bogra district from July to November 2007, in 60 indigenous, 20 Friesian  $\times$  *Desi* and 20 Sahiwal  $\times$  *Desi*. The indigenous cows are Zebu (*Bos indicus*) type, small in size. The information on production and reproduction was collected through interviewing farmers using pre-tested questionnaires, and data obtained from the farmers' cattle register. The following traits were used: daily milk yield, lactation length, age at puberty, gestation period, calving interval, number of services per pregnancy and onset of post-partum oestrus.

### *Statistical analysis*

The data were analyzed using analysis of variance with Completely Randomized Design (Steel and Torrie, 1980). Modified Duncan Multiple Range Test (DMRT) was used for test of significance of means with unequal subclass number (Kramer 1956).

## Results and Discussion

The mean values with standard deviation of the traits studied are presented in Table 1.

### *Daily milk yield*

The mean daily milk production of *Desi*, Friesian  $\times$  *Desi* cross and Sahiwal  $\times$  *Desi* cross cows were  $1.7 \pm 0.6$ ,  $6.3 \pm 1.2$  and  $5.1 \pm 1.0$  litres, respectively: the differences were significant ( $p < 0.01$ ). The results are consistent with those of Sultana *et al.* (2001) where daily milk production of *Desi*, Friesian  $\times$  *Desi* and Sahiwal  $\times$  *Desi* cows were 2.6, 7.2 and 4.9 litres, respectively. Our results partially agree with those of Ahmed and Islam (1987); Uddin *et al.* (2004); Rahman and Rahman (2006); Sarder (2001; 2006).

Globally, milk production increases 1.5% per year due to use of artificial insemination (AI), progeny testing, and intense selection of bulls. Milk yield is highly heritable, as cows produce more milk either by using ingested food or by mobilizing body fat (Schei *et al.*, 2005). Management and nutrition are important for milk production and fertility (Windig *et al.*, 2005; 2006).

Table 1. Mean  $\pm$  SD of productive and reproductive performance of *Desi*, Friesian  $\times$  *Desi* and Sahiwal  $\times$  *Desi* cows in *chars*

Parameters	<i>Desi</i> cow (n=60)	Friesian $\times$ <i>Desi</i> cross (n=20)	Sahiwal $\times$ <i>Desi</i> cross (n=20)	Level of significance
Daily milk production (litres)	1.7 $\pm$ 0.6 <sup>c</sup>	6.3 $\pm$ 1.2 <sup>a</sup>	5.1 $\pm$ 1.0 <sup>b</sup>	** (p<0.01)
Lactation length (days)	217.9 $\pm$ 18.7 <sup>c</sup>	253.8 $\pm$ 21.9 <sup>a</sup>	240.8 $\pm$ 15.7 <sup>b</sup>	** (p<0.01)
Age at puberty (months)	27.4 $\pm$ 2.7 <sup>a</sup>	23.9 $\pm$ 2 <sup>b</sup>	26.2 $\pm$ 2.4 <sup>a</sup>	** (p<0.01)
Gestation length (days)	277.4 $\pm$ 4.2	278.3 $\pm$ 4.2	278.3 $\pm$ 4	NS
Calving interval (days)	494.8 $\pm$ 27.3	487.5 $\pm$ 17.4	493.3 $\pm$ 16.2	NS
Number of services per conception	1.3 $\pm$ 0.5 <sup>b</sup>	1.6 $\pm$ 0.6 <sup>a</sup>	1.6 $\pm$ 0.5 <sup>a</sup>	** (p<0.01)
Onset of post partum oestrus (days)	145.6 $\pm$ 27.4 <sup>b</sup>	166.8 $\pm$ 33.0 <sup>a</sup>	170.5 $\pm$ 34.9 <sup>a</sup>	** (p<0.01)

Mean values with different superscripts differ significantly, (p<0.01). Parentheses indicate the total number of observation. SD = Standard deviation. NS = Non-significant

#### Lactation length

The mean lactation lengths of *Desi*, Friesian  $\times$  *Desi* and Sahiwal  $\times$  *Desi* cows were 217.9, 253.8 and 240.8 days, respectively. Lactation period of *Desi* cows was significantly (p<0.01) lower than those of Friesian  $\times$  *Desi* and Sahiwal  $\times$  *Desi* cows. The results are similar to those of Khan *et al.* (2001) who found that lactation length of *Desi* and Friesian  $\times$  *Desi* cross were 221 and 281 days, respectively. Sultana *et al.* (2001) found that the lactation length of *Desi*, Friesian  $\times$  *Desi* cross and Sahiwal  $\times$  *Desi* cows were 221, 287.5 and 254 days, respectively. The present findings partially agree with those of Ahmed and Islam (1987); Mondal (1998), Uddin *et al.* (2004); Rahman and Rahman (2006); Sarder (2001; 2006); Sarder *et al.* (2007). But the results differ from those of Nahar *et al.* (1992) who found the average lactation length of Friesian  $\times$  *Desi* cows was 330.5 days.

#### Age at puberty

The mean ages at puberty of *Desi*, Friesian  $\times$  *Desi* cross and Sahiwal  $\times$  *Desi* cross cows were 27.4, 23.9 and 26.2 months, respectively. The age at puberty of *Desi* cows was significantly (p<0.01) higher than that of Friesian  $\times$  *Desi*. The results are similar to those of Sultana *et al.* (2001) who found that the ages at puberty of *Desi*, Friesian  $\times$  *Desi* cross and Sahiwal  $\times$  *Desi* cross cows were 25.2, 21.4 and 24.4 months, respectively. The present findings partially concur with those of Rahman and Rahman (2006); Sarder (2006); Sarder *et al.* (2007); Khan and Khatun (1998); Haque *et al.* (1999).

#### Gestation length

The mean gestation lengths of *Desi*, Friesian  $\times$  *Desi* cross and Sahiwal  $\times$  *Desi* cows were 277.4, 278.3 and 278.3 days, respectively. There was no significant

difference between groups. The results are similar to those of Sarder *et al.* (2007) who found that gestation lengths of *Desi*, Friesian  $\times$  *Desi* and Sahiwal  $\times$  *Desi* cows were 279.7, 278.2 and 278.8 days, respectively. The same was stated by Rahman and Rahman (2006); Nahar *et al.* (1992); Majid *et al.* (1995); Sarder (2006); Islam and Bhuiyan (1997); Uddin *et al.* (2004); Khan and Khatun (1998). They found that the gestation length of different genetic groups ranged from 270 to 284 days. The gestation lengths of the present study fall within that range.

#### *Calving interval*

The mean calving intervals of *Desi*, Friesian  $\times$  *Desi* and Sahiwal  $\times$  *Desi* cows were 494.8, 487.5 and 493.3 days, respectively. There was no significant difference between groups. The results are similar to those of Uddin *et al.* (2004) who found that calving intervals of *Desi* and Friesian  $\times$  *Desi* cows were 484.1 and 489.2 days, respectively. Sultana *et al.* (2001) found that the calving interval of Sahiwal  $\times$  *Desi* cows was 453.7 days. The present findings partially agree with those of Rahman and Rahman (2006); Sarder (2006); Sarder *et al.* (2007); Majid *et al.* (1995).

#### *Number of services per pregnancy*

The mean number of services per pregnancy of *Desi*, Friesian  $\times$  *Desi* and Sahiwal  $\times$  *Desi* cows were 1.3, 1.7 and 1.6, respectively. The number of services per pregnancy of *Desi* cows was significantly lower ( $p < 0.01$ ) than that of Friesian  $\times$  *Desi* and Sahiwal  $\times$  *Desi*. The result for *Desi* cows is similar to that of Rahman *et al.* (2006) who found that the number of services per pregnancy of *Desi* cows was 1.5. Sarder *et al.* (2007) stated that the number of services per pregnancy in Friesian  $\times$  *Desi* and Sahiwal  $\times$  *Desi* cows was 1.6. The present findings partially agree with those of Bhuiyan and Sultana (1994); Chwdhury *et al.* (1994); Rahman and Rahman (2006); Uddin *et al.* (2004).

#### *Onset of post partum oestrus*

The mean times to post-partum oestrus of *Desi*, Friesian  $\times$  *Desi* and Sahiwal  $\times$  *Desi* cows were 145.6, 166.8 and 170.5 days, respectively. The time for *Desi* cows was significantly ( $p < 0.01$ ) shorter than for Friesian  $\times$  *Desi* and Sahiwal  $\times$  *Desi*. The result for *Desi* cows is similar to that of Sarder *et al.* (2007) who found the time to post partum oestrus was 147 days. Uddin *et al.* (2004) stated that post-partum oestrus in Friesian  $\times$  *Desi* and Sahiwal  $\times$  *Desi* cows were 182.2 and 171.8 days, respectively. The present findings partially agree with those of Rahman and Rahman (2006); Majid *et al.* (1995).

It may be concluded that the overall productive and reproductive performance of Friesian  $\times$  *Desi* and Sahiwal  $\times$  *Desi* cows was better than that of *Desi* (indigenous) cows. Except for the number of services per pregnancy and time to post-partum oestrus, Friesian  $\times$  *Desi* cows were best, followed by Sahiwal  $\times$  *Desi* and *Desi* cows. On the other hand, the number of services per pregnancy (1.3) and time to post-partum

oestrus (145 days) were better for *Desi* than for Friesian  $\times$  *Desi* and Sahiwal  $\times$  *Desi* cows. Therefore, an upgrading programme through crossbreeding with superior bulls' semen using AI is an option to enhance the genetic potential of these cows. However, unless we have more information on accurate phenotypes, there is an inherent risk that the genomic selection lacks proper counter-information on dairy cattle physiology, behaviour and pathological constraints, thus becoming less beneficial than expected

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