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A Comparative Study on Productive and Reproductive Performance of Different Crossbred and Indigenous Dairy Cows under Small Scale Dairy Farm Conditions

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Abstract: The study has been conducted to compare the productive and reproductive performances of indigenous and crossbred cows. Fifty small diary farms were taken covering 8 Thanas of Jessore and a random sample of 75 cows. Statistical analysis showed significant differences ($P<0.01$) within the age at puberty, service per conception, calving interval, milk yield and lactation length of different types of dairy cows. In case of gestation length, there were no significant ($P>0.05$) differences. Shortest age of puberty (6.42 days) and highest service per conception (2.43) were found for Friesian cross. There was no difference in the gestation length (278 days) of the four crosses. The highest value (278 days) was observed in indigenous cow. Friesian cross were observed to have the lowest calving interval (414 days). The highest daily milk yield (7.2 liter) were observed in Friesian cross. Considering above parameters except service per conception, Friesian cross cows were more profitable, acceptable and highest producers than others.

Key word: Productive performance, reproductive performance.

Introduction

The cattle population of Bangladesh is mostly of indigenous non-descriptive type. Indigenous cattle have poor levels of milk production and unsatisfactory reproductive performance. Indigenous cows are being graded-up using different exotic breeds such as Sindhi Sahiwal, Jersey and Holstein Friesian. Data of productive performances of these crossbred cows are limited. We don't have enough information about milk yield, lactation length, gestation length, age at puberty, calving interval, service per conception of raising farms under small dairy farm management conditions. Hossain and Routledge (1982) reported that Jersey and Friesian cross cows produced more milk and had shorter calving intervals than Pabna and Deshi cows under village milk shed management conditions in Pabna and similar areas. Study of the performance of crossbred cattle is useful to the animal breeders in getting information, that helps to improve our native cattle. Hence, the present study was undertaken to determine and compare the productive and reproductive performances of different crossbred and indigenous dairy cows under small scale dairy farm conditions.

Materials and Methods

The information on the productive and reproductive performance of 75 cows of indigenous and different crossbreds were collected from 50 small dairy farms in Jessore. Data were collected during the month of October 1998 to February 1999. The cows were equally divided into five groups such as Friesian cross, Jersey cross, Sahiwal cross, Sindhi cross and indigenous. The following traits were used to measure the productive and reproductive performances of different crossbred and indigenous cows: Age at puberty, service per conception, gestation length, calving interval, milk yield and lactation length. The collected data were analyzed statistically using a completely randomized design (CRD). LSD values were also calculated to find the significant differences within different treatment means (Gomez and Gomez, 1984).

Results and Discussion

Age at puberty: The average age at puberty of different types of dairy cows found at small dairy farms in Jessore are presented in Table 1. It was observed that the age at puberty of indigenous, Friesian cross, Jersey cross, Sahiwal cross and Sindhi cross cows were 755.67 ± 63.41, 642.67 ± 108.67, 676.33 ± 161.08, 732.67 ± 40.31 and 750.33 ± 43.44 days respectively. Statistical analysis showed that there were significant differences ($P<0.01$) within the age at puberty. The value for Friesian cross at puberty age obtained in this study appears to be lower than that reported by Nahar *et al.* (1989) and may be attributed to the difference in environment, nutritional stress during growing period and managemental effect.

Service per conception: Service per conception of indigenous, Friesian cross, Jersey cross, Sahiwal cross and Sindhi cross cows were 1.69 ± 0.55, 2.43 ± 0.68, 2.08 ± 0.52, 1.95 ± 0.47 and 1.84 ± 0.58 respectively (Table 1). Statistical analysis showed that there were significant differences ($P<0.01$) within the service per conception of different types of genotypes. Mondal (1998) stated that service per conception were lower for different crosses in BAU Dairy Farm than this study. The variation in results between studies might be due to semen quality, insemination techniques, time of insemination, skillness of inseminator, reproductive disease, feeding practices and environment.

Gestation length: The average gestation length of different dairy cows are presented in Table 1. It was found that average gestation length of indigenous, Friesian cross, Jersey cross, Sahiwal cross and Sindhi cross cows were 279.73 ± 2.71, 278.52 ± 3.31, 277.00 ± 2.86, 278.07 ± 3.26 and 278.20 ± 2.27 days respectively. Statistical analysis showed non-significant differences ($P>0.05$) within the gestation length of different types of dairy cows. Mondal (1998) and Nahar *et al.* (1989) recorded that the gestation period of different crosses varies little from 280 days which is similar to studies. In all studies it was observed that the effect of breed was non significant on gestation length.

Calving interval: Average calving interval for indigenous and different crossbred cows was 472.67 ± 30.87, 414.53 ± 18.35, 448.07 ± 23.16, 453.67 ± 24.31 and 457.67 ± 30.17 days for indigenous, Friesian cross, Jersey cross, Sahiwal cross, Sindhi cross respectively (Table 1). Statistical analysis showed that there were significant

Table 1 : Summary of different parameters for dairy cows

Parameter	Indigenous mean, ± SD .	Friesian cross Mean ± SD.	Jersey cross Mean ± SD.	Sahiwal cross Mean ± SD.	Sindhi cross Mean ± SD.	LSD **	Level of significance
Age at puberty (days)	755.67^{b} ±63.41 15	642.67^{a} ± 108.67 15	676.33^{ab} ±2161.08 15	732.67^{ab} ±2161.08 15	760.33^{b} ±43.44 15	92.04	** (P<0.01)
Service per conception	1.69^{a} ±0.55 15	2.43^{b} ±0.68 15	2.08^{ab} ±0.52 15	1.95^{ab} ±0.47 15	1.84^{a} ±0.68 15	0.55	** (P<0.01)
Gestation length (days)	279.73±2.71 15	278.53±3.31 15	277.27±2.86 15	278.07±3.26 15	278.20	-	NS
Calving interval (days)	472.73±2.71 15	414.53^{a} ± 18.35 15	448.07^{b} ±23.16 15	453.67^{b} ±24.31 15	457.67^{b} ±30.17 15	24.95	** (P<0.01)
Milk yield (Liter/day)	2.63^{a} ±0.38 15	7.20^{a} ± 1.07 15	5.70^{b} ±0.86 15	4.86^{c} ±0.85 15	4.05^{d} ±0.54 15	0.73	** (P<0.01)
Lactation length (days)	221.00^{a} ± 17.65 15	287.47^{a} ± 10.20 15	254.33^{b} ± 19.54 15	254.33^{b} ± 19.54 15	264.33^{b} ± 16.68	15.27	** (P<0.01)

Means with different superscript(s) in the same row differ significantly (P<0.01) ** = Significant at 1% level of probability
NS = Non significant ((P>0.05) SD = Standard Deviation No. = Number

differences (P<0.01) within the calving interval of different types of dairy cow. H.F cows had a shroter calving interval than that of other crosses. These results are partially in agreement with the findings of Mondal (1998).

Milk yield: It was seen (Table 1) that the average milk yield per day of indigenous Friesian cross, Jersey cross, Sahiwal cross and Sindhi cross were 2.63±0.38, 7.20±1.07, 5.70±0.86, 4.86±0.85 and 4.05±0.54 liters respectively. Statistical analysis showed significant differences (P<0.01) within the milk yield of different types of dairy cow. The yield for indigenous, Freisian cross and Jersey cross were closer to those observed by Ahmed *et al.* (1987).

Lactation period: The average lactation length of indigenous Friesian cross, Jersey cross, Sahiwal cross and Sindhi cross cows were 221.00±17.65, 287.47±10.20, 296.47±13.12, 254.33±19.54 and 264.33±16.08 days respectively (Table 1). Mondal (1998) reported the lactation length for different crosses which contradict to the present study. Ali *et al.* (1998) observed that average lactation length for crossbred and indigenous dairy cows were about 266 and 220 days respectively which are more or less similar to this study.

From the above discussion, it may be concluded that overall productive and reproductive performances of different crossbreds were observed better than that of indigenous. In the comparative judgement of above parameters under study except service per conception, Friesian cross was found to be highest producer, acceptable and profitable followed by Jersey cross, Sahiwal cross, Sindhi cross and indigenous cows. Though the indigenous cows appeared to be inferior in above cases but their service per conception was observed better (1.69) than that of different crossbred cows.

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