

A COMPARATIVE STUDY ON THE PERFORMANCES OF F₁ CROSSBRED COWS UNDER RURAL CONDITIONS

T. N. Nahar¹, M. Islam and M. A. Hasnath²

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

Summary

Data were collected on productive and reproductive performance of different F₁ crossbred cows (Deshi cows joined by A.J. to Sindhi, Sahiwal, Jersey or Holstein-Friesian Bull semen) reared by farmers in and around the Bangladesh Agricultural University campus at Mymensingh. The traits considered were birth weight, age at first heat, age at first calving, gestation length, post-partum heat period, milk yield, lactation length, dry period and calving interval. Data were analyzed statistically using a completely randomized design and Duncan's Multiple Range Test to compare and determine the significance of between individual group means.

It was observed that the Holstein × Deshi had the highest birth weight (21.4 kg) followed by Sahiwal (17.6 kg), Jersey (16.7 kg) and Sindhi (16.1 kg). Shortest age at first heat (854 and 920 days) and age at first calving (1002 and 1201 days) were found for the Jersey × Deshi and Holstein × Deshi crosses respectively. The post-partum heat period were significantly different between breeds with Jersey and Holstein sired calves having the shortest intervals. There was no difference in the gestation length of the four crosses. Holstein × Deshi and Jersey × Deshi cows gave the highest milk yields due to longer lactation periods and higher daily milk production. Similarly, Holstein × Deshi and Jersey × Deshi crosses had significantly shorter dry periods and Jersey × Deshi had a shorter calving interval.

From this study it may be concluded that exotic genotypes such as Holstein-Friesian and Jersey can perform very well under rural conditions in Bangladesh.

(Key Words: Productive Performance, Reproductive Performance)

Introduction

In Bangladesh native cattle have poor levels of milk production and unsatisfactory reproductive performance. The technique of artificial insemination is playing a vital role due to the advancement of science and the extension of an artificial insemination program throughout the country. Indigenous cows are being graded-up using different exotic breeds such as Sindhi, Sahiwal, Jersey and Holstein-Friesian. However the productive and reproductive performance of crossbred progeny has not yet been studied under rural conditions in Bangladesh. The Kerala experiment

in India (Nair, 1974) has shown that the new technology of crossbreeding can contribute to a rapid break through in milk production. He also reported that crossbred cows have an early age at first calving, a comparatively longer lactation period and a shorter inter-calving period when compared to native cows. Similarly 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 breeder in getting information which will help to improve our native cattle. Hence the present study was undertaken to determine the productive and reproductive performance of crossbred cows under rural management conditions.

Materials and Methods

Two hundred and twenty five F₁ crossbred

¹Address reprint requests to Dr. T. N. Nahar, Animal Production Research Division, Bangladesh Livestock Research Institute, Savar Dhaka 1341, Bangladesh.

²Department of Animal Breeding and Genetics Bangladesh Agricultural University, Mymensingh 2202, Bangladesh.

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cows viz. 64 Sindhi × Deshi (Si × D), 65 Sahiwal × Deshi (Sa × D), 53 Jersey × Deshi (J × D) and 43 Holstein-Friesian × Deshi (H × D) were studied to collect information on various productive and reproductive traits. The cattle were reared by farmers in and around the Bangladesh Agricultural University (BAU) campus at Mymensingh. Local/Deshi were inseminated using semen from the BAU Artificial Insemination (A.I.) laboratory. At first the farmers rearing crossbred cows were identified according to the record maintained at BAU A.I. laboratory. The crossbred cows borned during the years 1978 were only considered for this study. The traits considered were birth weight, age at first heat, age at first calving, gestation length, post-partum heat period, milk yield, lactation length, dry period and calving interval. Birth weight and postpartum heat period were collected from the records maintained at the A.I. laboratory, BAU, Mym-

ensingh. Information for rest of the parameters were collected by interviewing the owners of the cows. A period from 1978 to 1986 were included to collect all the data on the considered parameters for this study. One or more of the different crosses were reared on the same household. All the crossbred cows reared in the farm household by traditional rearing system. Under traditional system of rearing farmers give some concentrate to their animals in the morning. The amount of concentrate feeds depend on the farmer's ability. After milking in the morning they allowed their animals to graze on homestead area, road sides or fallow land after harvesting a crop. In the evening they supplied straw to the animals. Collected data were analysed statistically using a completely randomized block design and differences between breeds for various parameters were compared using Duncan's Multiple Range test (Steel and Torrie, 1980).

TABLE 1. PERFORMANCES OF F₁ CROSSBRED COWS UNDER RURAL CONDITIONS

Traits	Sindhi × Deshi	Sahiwal × Deshi	Jersey × Deshi	Holstein-Friesian × Deshi
Birth weight (kg)	16.1 ^c ± 0.2 (64)	17.6 ^b ± 0.3 (44)	16.7 ^c ± 0.2 (53)	21.4 ^a ± 0.2 (43)
Age at first heat (days)	1057.6 ^b ± 26.8 (60)	1058.7 ^b ± 28.9 (65)	854.4 ^a ± 34.1 (42)	919.6 ^a ± 17.4 (43)
Age at first calving (days)	1450.5 ^b ± 33.8 (60)	1349.4 ^b ± 31.5 (64)	1002.3 ^a ± 49.4 (44)	1201.4 ^a ± 29.6 (43)
Gestation period (days)	280.3 ^a ± 0.3 (60)	279.6 ^a ± 0.4 (52)	279.7 ^a ± 0.3 (42)	280.1 ^a ± 0.2 (43)
Post-partum heat period (days)	165.7 ^c ± 6.9 (60)	148.6 ^b ± 8.8 (52)	120.4 ^a ± 7.2 (42)	123.1 ^a ± 4.3 (42)
Milk yield (kg)/ lactation	949.1 ^c ± 19.6 (60)	870.4 ^c ± 24.2 (51)	1156.1 ^b ± 33.9 (38)	1702.8 ^a ± 44.2 (41)
Milk yield (kg/day)	3.6 ^c ± 0.1 (60)	2.9 ^c ± 0.1 (51)	3.8 ^b ± 0.1 (38)	5.5 ^a ± 0.1 (41)
Lactation period (days)	263.9 ^c ± 2.2 (60)	296.7 ^b ± 2.5 (51)	304.4 ^b ± 3.6 (38)	330.5 ^a ± 3.6 (41)
Dry period (days)	216.1 ^c ± 5.5 (58)	193.6 ^b ± 10.0 (43)	130.9 ^a ± 6.4 (38)	148.1 ^a ± 8.8 (40)
Calving interval (days)	485.8 ^b ± 3.9 (56)	479.4 ^b ± 7.9 (44)	428.6 ^a ± 6.3 (38)	470.7 ^b ± 8.3 (40)

^{a,b,c} Means with different superscripts in the same row differ significantly (at least at $p < 0.05$).

Results and Discussion

Birth weight

The average birth weights of Si × D, Sa × D, J × D and H × D calves were 16.1, 17.6, 16.7 and 21.4 kg respectively (table 1), with H × D calves being significantly ($p < 0.05$) heavier than the other crosses. The birth weights of Si × D and Sa × D progeny were in close agreement with the findings of Husain and Mostafa (1985). The observed birth weights of J × D and H × D calves are also consistent with the observations of Hussain and Routledge (1982).

Age at first heat

The age at first heat of J × D and H × D calves (854 and 920 days respectively) were significantly earlier than the Sa × D and Si × D calves. The value for J × D age at first heat obtained in this study appears to be much higher than that reported by Saikia and Sorma (1977) and may be attributed to the difference in environment and nutritional stress during the growing period.

Age at first calving

The age at first calving significantly favoured J × D and H × D cows relative to the Sa × D and Si × D cows, although there had a lower age at first calving than similar cross cows observed by Hussain and Routledge (1982). However, the age at first calving for Si × D and Sa × D cows were higher in our study than the values reported by Husain and Mostafa (1985). The variation in results between studies may be explained by variation of environment, nutrition and management given to the cows.

Gestation period

The gestation period of the different crosses varied little from 280 days which is similar to the periods recorded by Agati et al. (1974).

Post-partum heat period

A significantly shorter post-partum heat period was recorded for H × D cows (123 days) and J × D cows (120 days) than from Sa × D cows, which in turn had a significantly shorter post-partum heat period than Si × D cows. Rice et al. (1951) suggested that breeding is usually delayed until 60 to 70 days after parturition,

while the uterus undergoes involution and preparation for the next pregnancy. In our study a longer post-partum heat period was probably due to improper heat detection, or reproductive and nutritional problems. This would agree with the report by Eddy (1980) who speculated that reproductive problems such as ovarian disorders, can cause a delay in the post-partum first service interval.

Milk yield and lactation period

The highest per day milk yield was observed for the H × D cross (5.2 kg), followed by the J × D cross (3.8 kg), Si × D cross (3.6 kg) and Sa × D (2.9 kg); with H × D, J × D and Si × D yielding 75%, 26% and 24% more milk than Sa × D, respectively. Similar differences were found for both milk yield and length of lactation period. The milk yields Si × D and Sa × D cows are in agreement with the findings of Sivarajasingam and Mukherjee (1975) and Ishaq et al. (1981). The yields for H × D and J × D cows were closer to those observed by Hossain and Routledge (1982).

Dry period

The average dry period was 216 days for Si × D and 194 days for Sa × D, which were significantly longer than the 131 days for J × D and 148 days for H × D. The dry periods for J × D and H × D cows are in agreement with those reported by Mitra and Chatterjee (1980). In contrast the results for Si × D and Sa × D of this cows recorded in this study were lower than those reported by Hossain and Routledge (1982) for similar crosses.

Calving interval

Jersey sired cows had a significantly shorter calving interval (429 days) than that of the crossbred cows sired by Holstein, Sahiwal or Sindhi bulls. The calving interval for Si × D and Sa × D were similar to the findings of Ghosh et al. (1977) and Sivarajasingam and Mukherjee (1975).

From the present study it may be concluded that inseminating Deshi cows with semen from Jersey or Holstein-Friesian bulls produced F₁ cows which produced more milk and had a shorter post-partum heat period, calving interval, dry period, age at first calving and age at first heat,

than crossbred cows from Deshi cows inseminated with Sahiwal or Sindhi semen.

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