

Comparative Study on the Productive and Reproductive Performance of Different Dairy Genotypes Reared in Bangladesh Agricultural University Dairy Farm

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Abstract: The study was conducted at Bangladesh Agricultural University Dairy Farm for a period of six months. A total of 164 dairy cows belongs to different breeds, such as Jersey cross, Sahiwal cross, Sindhi cross, Holstein cross and Red Chittagong cows were selected and their information regarding milk production and other reproductive parameters were collected from farm records for a period of last five years (1993-1997). The number of animals of each of the genotypic classes were 48 for Jersey cross, 46 for Sahiwal cross, 35 for Sindhi cross, 20 for Holstein cross and 15 for Red-Chittagong. Significant difference was found within the milk yield ($p < 0.01$), calving interval ($p < 0.05$) and birth weight of calves ($p < 0.01$) of different types of dairy cows. In case of lactation length, gestation length and service per conception, there were no significant differences ($p > 0.05$). Highest milk yield (3.20 lit/day), highest birth weight of calves (15.2 kg) and lowest calving interval (414 days) were observed for Holstein cross. The lowest milk yield (2.46 lit/day) and lowest birth weight of calves were found in Red-Chittagong cows. Production performance of Holstein crossbred were superior to other dairy crossbreds. Jersey crossbred ranked second and performances of other genotypes were nearly similar.

Key words: Productive, reproductive, milk yield, crossbred dairy cows

Introduction

Most of the cattle population in Bangladesh is non-descriptive types, which do not belong to any specific breed and termed as indigenous cattle. They are smaller in size and their milk production capacity is much lower than that of exotic breeds. The average milk production of local cow is very low and it varies between 300 to 400 liters per lactation period of 180 to 240 days. Generally crossbred cows yield from 600 to 800 litres per lactation of 210 to 240 days (Islam, 1992). The most economic traits of the milk-producing animals are average body weight, milk yield, calving interval, conception rate, birth weight of calves, gestation length etc. Now a day the demand for crossbred cows are very high because of higher production of milk (ranging between 10-15 kg/day). It is interesting to note that a reasonable number of landless and marginal farmers have found crossbred cows as a profitable enterprise under improved nutrition, better disease control and management. No specialized breed has yet developed in the country, which is essential to gear up the milk production. In order to establish future plan for dairy development, we have to know details about the performance of different types of dairy breeds available in our country.

Bangladesh Agricultural University has a well equipped dairy farm used for conducting different types of research. Different types of dairy cattle such as Jersey cross, Sahiwal cross, Sindhi cross, Holstein cross and

Red Chittagong are available in this farm. We don't have enough information about productive and reproductive performances of these breeds under farm management condition. Hence the present comparative study was undertaken with the following objectives in mind.

- i) To know the productive and reproductive performance of different dairy breeds and crossbreds in Bangladesh Agricultural University Dairy Farm.
- ii) To recommend farmers about the rearing and management practice to be applied at dairy farm.
- iii) To recommend farmers about the breed and type of animals which are to be suitable in existing ecological and socio-economical condition of Bangladesh.

Materials and Methods

The present experiment was conducted at Bangladesh Agricultural University Dairy Farm for a period of six months from July' 1997 to December' 1997. For this experiment a total of 164 dairy cows belongs to different breeds, such as Jersey cross, Sahiwal cross, Sindhi cross, Holstein cross and Red Chittagong cows were selected and their information regarding milk production and other reproductive parameters were collected from farm records for a period of last five years (1993-1997). The number of animals of each of the genotypic classes were 48 for Jersey cross, 46 for Sahiwal cross, 35 for Sindhi cross, 20 for Holstein cross and 15 for Red-

Mondal *et al.*: Dairy Genotypes Reared in Bangladesh

Table 1: Summary of different parameters measured from different types of dairy breed

Genotypes	Parameters					
	Milk Yield (Litre/day)	Lactation length (days)	Gestation length (days)	Service per conception	Calving interval (days)	Birth weight of calves (kg)
Jersey Cross	3.08±0.70 (48)	281±109 (48)	275±4.11(48)	1.63±0.61(48)	501±86.4 (32)	14.2±1.73 (22)
Sahiwal cross	2.84±0.61(46)	245±106 (46)	276±4.26 (46)	1.63±0.64 (46)	445±94.9 (30)	13.5±0.89 (21)
Sindhi cross	2.99±0.48 (35)	228±65.7 (35)	274±4.41 (35)	1.60±0.65 (35)	431±98.3 (24)	13.6±0.99 (20)
Holstein cross	3.20±0.40 (20)	250±38.6 (20)	275±3.95 (20)	1.60±0.59(20)	414±51.4 (16)	15.2±0.87(18)
Red-Chittagong	2.46±0.40 (15)	283±58.7 (15)	277±3.31 (15)	1.67±0.62 (15)	469±124 (10)	13.5±1.02 (13)
Overall	2.95±0.60(164)	256±91(164)	275±4.11(164)	1.62±0.62(164)	458±94.1(112)	14.0±1.31(94)
S.E.D	0.1028	38.834	1.7930	0.2717	39.220	0.6163
Level of significance	**	N.S.	N.S.	N.S.	*	**

N.S = Non Significant ; * =Significant at 5% level (p<0.05); ** =Significant at 1% level (p<0.01)

Chittagong. The animals, which have at least five lactation periods, were only used for this study. Similarly, birth weights of 94 calves from different genotypes were collected to monitor the effect of breeds on birth weight of calves. Stall feeding was the main feature of feeding, although very limited grazing was also done. Milk yield, lactation length, gestation length, service per conception, calving interval, birth weight of calves were used to measure the productive and reproductive performance of different genotypes. The collected data were statistically analyzed as per steel and Torrie (1980) using Completely Randomized Design (CRD). Analysis of variance test was performed to find the statistical difference between the productive and reproductive traits of different breeds. SED values were also calculated to find the significant differences within the different treatment means.

Results and Discussion

Milk yield of cows of different genotypes from Bangladesh Agricultural University Dairy Farm is presented in Table 1. It was found that the average milk yield of Jersey cross, Sahiwal cross, Sindhi cross, Holstein cross and Red-Chittagong was 3.08±0.70, 2.84±0.61, 2.99±0.48, 3.20±0.40 and 2.46±0.40 liter/day, respectively. Statistical analysis showed that there was significant difference (p<0.01) within the milk yield of different breeds. Among the different types of cows highest milk production was recorded in case of Holstein cross and lowest was recorded in case of Red-Chittagong. The overall average milk production of the above mentioned genotypes was 2.95±0.60 litre/day. The result of present study agrees with the work of Halim (1992) who found that average milk yield of crossbred dairy cows was 3.09 litre/ day. Similarly Nahar *et al.* (1992) reported that average daily milk yield of Sindhi x Deshi , Sahiwal x Deshi, Jersey x Deshi and Holstein x deshi graded animals were 3.0±0.1, 2.9±0.1, 3.8±0.1, and 5.5±0.1 kg, respectively. Although the milk production of crossbred cows of our experiment agrees more or less with the findings of above authors, but the

average milk production of crossbred cows of Bangladesh Agricultural University Dairy Farm are not satisfactory.

Their milk production should have been more than 5.0 litre/day. This result indicates that crossbred dairy cows are not well in our country condition. Rearing cost of crossbred cows are generally high, they need more feed, more care and are not well adopted with our hot humid climatic condition and the same time their disease resistance capacity is very low. On the other hand, we can not ignore our native cows. Although milk production of Red-Chittagong dairy cows are slightly lower than crossbred cows, their other performances are very good. Their size is smaller than crossbred cows and needs less feed. Producing calf in each year, their disease resistance capacity is very high and needs less management facilities for rearing them. By selective breeding of better type of Native Red-Chittagong breed it will be possible to bear in mind that native cows are well adopted with the climatic condition of Bangladesh, they can thrive well with fluctuant level of nutrition and they have high disease resistant capacity.

Lactation length: The average lactation length of different types of dairy cows of Bangladesh Agricultural University Dairy Farm is presented in Table 1. It was found that lactation length of Jersey cross, Sahiwal cross, Sindhi cross, Holstein cross and Red-Chittagong cows 281±109; 245±106; 228±65.7; 250±38.6 and 283±58.7 days, respectively. Lowest lactation length was found in case of Sindhi cross and highest lactation length was of Red-Chittagong cow. Statistical analysis showed that there was no significance difference among the lactation length of different types of dairy cows. The lactation period of present finding are more or less similar with the findings of Hasan (1995), who found that average lactation period of Jersey cross, Holstein cross, Sahiwal cross, Sindhi cross were 286±40.2, 272±55.3, 262±51.5 and 255±61.5 days respectively. In another experiment, lactation period of Pabna and other

Mondal *et al.*: Dairy Genotypes Reared in Bangladesh

crossbred cows under farm conditions was studied by Khan *et al.* (1991). They reported that lactation period of Pabna, Sindhi cross and Sahiwal cross were 200 ± 113 , 251 ± 12.6 and 282 ± 96.5 days respectively. The result of present study nearly agrees finding of Khan *et al.* (1991).

Gestation length: Average gestation length of different dairy cows was presented in Table 1. It was found that average gestation length for jersey cross was 275 ± 4.11 days, for Sahiwal cross was 276 ± 4.26 days, for Sindhi cross was 275 ± 4.41 days, for Holstein cross was 275 ± 3.95 days and for Red-Chittagong was 277 ± 3.31 days. Slightly higher and lower values were for Red-Chittagong and Sindhi cross cows, respectively. It is also evident that there was no significant difference within the gestation length of different dairy cows. Gestation length of different crossbred dairy cows under farm and urban conditions were studied by Nahar (1987) and found that the mean gestation of Sindhi, Sahiwal, Jersey and Holstein crossbred cows under farm condition was 281, 280, 280 days, while under urban condition 280, 280, 280 and 280 days, respectively. In another experiment Hasan (1995) observed that gestation length for indigenous, Jersey cross, Sindhi cross, Sahiwal cross and Holstein cross were 284 ± 4.5 , 281 ± 3.94 , 286 ± 7.2 , 282 ± 3.25 and 284 ± 4.15 days, respectively. In all studies, it was observed that breed had no significant effect on the gestation length. The finding of our experiment agrees with the result of above authors and in this connection, Hasan (1995) indicated that probably there is no breed difference for the gestation length of cattle.

Service per conception: Average service per conception for different dairy cows is presented in Table 1. It is observed that service per conception was 1.63 ± 0.61 , 1.63 ± 0.64 , 1.60 ± 0.65 , 1.60 ± 0.59 and 1.67 ± 0.62 for jersey cross, Sahiwal cross, Sindhi cross and Red-Chittagong cows, respectively. Statistical analysis showed that there was no significant difference within the service per conception of different genotypes. Jabbar and Ali (1988) studied the productive performance of local and crossbred cows in Bangladesh, and overall value of service per conception was 1.66 ± 0.57 . The observed value of crossbred, local (milk) and local (draft) were 1.61 ± 0.52 , 1.26 ± 0.30 and 1.72 ± 0.59 , respectively. From another study, Chowdhury, (1995) reported that average service per conception for local, local x Holstein and Sahiwal x Holstein cows were 1.70 ± 0.91 , 1.72 ± 0.88 and 2.01 ± 1.03 , respectively.

Calving interval: Average calving intervals for different dairy cows are presented in Table 1. It is found that calving interval was 501 ± 86.4 , 445 ± 94.9 , 451 ± 89.3 , 414 ± 51.4 and 469 ± 124 days for Jersey cross, Sahiwal

cross, Sindhi cross, Holstein cross and Red-Chittagong cows, respectively. Statistical analysis showed that there was significant difference ($P < 0.05$) within the calving interval of different dairy cows. Among the different types of cows, highest interval was recorded in case of Jersey cross and lowest was recorded in case of Holstein cross. The overall average calving interval of the above mentioned genotypes was 458 ± 94 days. These results are more or less similar with the findings of Nahar (1987) who found that the mean calving of Sindhi, Sahiwal, Jersey and Holstein crossbred cows under farm conditions was 452, 486, 436 and 479 days, respectively. In another experiment, Hasan (1995) observed that calving interval of Jersey cross, Sahiwal cross, Sindhi cross, Holstein cross was 499 ± 87.4 , 488 ± 61.4 , 491 ± 99.4 , 515 ± 103 days, respectively. Variations in calving interval of different breeds might be due to genetic, environmental, feeding and managerial effects.

Birth weight of calves: Average birth weight of calves of different dairy cows was presented in Table 1. It was found that average birth weight of calves of Jersey cross was 14.2 ± 1.73 kg, for Sahiwal cross was 13.5 ± 0.89 kg, for Sindhi cross was 13.6 ± 0.99 kg, for Holstein cross was 15.2 ± 0.87 kg and for Red-Chittagong was 13.5 ± 1.02 kg. Statistical analysis showed that there was significant difference ($P < 0.01$) within the birth weight of calves of different dairy cows. Among the different types of cows highest birth of was recorded in case of Holstein cross and lowest was recorded in case of Sahiwal cross. Khan (1990) found that average birth weight of calves for Jersey, Sahiwal, Sindhi crossbred and Red-Chittagong calves were 17.1 ± 0.17 , 17.8 ± 0.18 , 17.9 ± 0.17 and 17.4 ± 0.20 kg, respectively.

Judging from the overall analysis of the results, it may be concluded that production performance of Holstein crossbred were superior to other dairy crossbreds. Jersey crossbred ranked second and performances of other breeds were nearly similar. Although our native Red-Chittagong cows produce little less milk than crossbreds, it is our native breed and was adjusted with our climatic condition. In this situation if we want to improve the productive and reproductive performance, study is needed regarding this parameters. Experiment on production and reproduction indicated that the milk production of crossbred cow is higher than that of Red-Chittagong cows but the managerial point of view, it is easier than that of crossbred cows. For the improvement of the breed of cows in our country, at first we have to consider the productive and reproductive performances of different crossbreds existing in our country and then they have to be adapted with our native climate. Thereafter a selection program is to be implemented by considering the breed characteristics of the cow and that will be our great gain.

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