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Short communication

A CROSS-SECTIONAL STUDY ON PRODUCTION PERFORMANCE OF STALL FED DAIRY CATTLE AT CENTRAL CATTLE BREEDING STATION (CCBS), SAVAR, DHAKA

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ABSTRACT

To evaluate milk production performance in stall feeding dairy cattle in relation to associated biological factors such as age of cow, age of first calving, breed and number of parity at Central Cattle Breeding Station, Savar, Dhaka, a cross sectional study was performed on April, 2002 using a structured questionnaire. Local (21%), pure bred "Sahiwal" (12%) and cross bred (L×F1; L×F2; L×F3; SL×F2>) (67%) were the breed of studied cows (n = 62). The average age and milk production of the cow was 94.9 months and 3.9 liter/cow/day. The parity number and age at first calving of a cow were recorded to be average 4 and 43 months respectively. The younger cows (≤99 months) were 6.7 time more likely to have yielded >3 liters/cow/day than the older cows (>99 months) ($p < 0.001$). Cows with ≤4 parities were recorded to have 7.6 times more chance to produce milk of >3 liters/cow/day than cows with ≥4 parities (10.9%) ($p < 0.001$)). The milk production of >3 liters/cow/day is 39.3 times higher in the crossbred than the milk production in the local breed ($p < 0.001$).

Keywords: Milk production, potential factors (age, age at first calving, breed, genotype and parity), dairy cattle

INTRODUCTION

Dairy industry is a crucial component of agro-based economy for a country like Bangladesh. The profitability of dairying depends upon the sound management and selection of better genotype which determine the level of production either farm or individual level. As generally indicative to a better management index at farm level average age of first calving should be optimally around 2 years while the average interval between two calvings should ideally not exceed 13 to 14 months (Wiltbank, 1970; Sarder, 2001). Biologically potential for milk production depends on the age at puberty, early first calving, number of parity and shorter calving interval. However, the intensity of production traits differs according to the genotype of breeds and between parities (Djemali and Freeman, 1987; Rahman *et al.*, 1987). The productive and reproductive performance of indigenous crossbred cows with high yielding exotic may differ among different geographical areas (Jahan *et al*., 1990; Alam and Ghosh, 1994). However, the potential for milk production not only attributed with the genetic make up of a cow, but also have an interaction with environment or variation of management could considerably limit the expected farm level production. Assessment of production and reproductive performance not only depends on a single parameter but also depends on composite parameters to asses overall performance evaluation. The productive and reproductive performance at both subsistence and semi-intensive or intensive farm level in dairy cows had been subjected to a number of studies elsewhere in Bangladesh (Alam and Ghosh, 1988; Ghosh *et al.*, 1988; Shamsuddin *et al.*, 1987) where delayed puberty, long post partum intervals with or without gynecological disorders had been encountered. Although the results of reproductive traits of dairy cows are available, these often do not correspond with the real scenario. It has been well documented that both individual and cow level and farm level determinants influences the productive performance in dairy cows (Sarder *et al.*, 1997). This variation is supposed to be greater in larger farms. The present study is therefore undertaken to evaluate milk production potential and to identify cow level factors affecting productive performance in dairy cows in largest and organized Government Dairy farm at Savar.

MATERIALS AND METHODS

A cross sectional study was conducted on 62 cows at Central Cattle Breeding Station (CCBS), Savar on April, 2002. A cumulative average milk production for 4 months/cow with breed, age (months), age at first calving (months), number of parity were recorded from 62 local indigenous, pure and cross bred cows from the existing record reserved following the structured questionnaire. The data obtained were scrutinized and entered into Microsoft Excel-2000 and imported to STATA-7.0 for the descriptive and univariate analysis. The distribution of categorical and continuous variables was expressed as percentages and mean (± SD). A univariate logistic regression was used to assess the strength of association of milk production (1 = >3 liters/cow/day; 0 = ≤3 liters/cow/day; category based on the percentile of 50%) with the following explanatory variables such as age (month), age at first calving, number of parity and types of breed. The univariate results were expressed as odd ratios with the significant p-values.

RESULTS AND DISCUSSION

Descriptive results

Breed (n = 62) constituted local (21%), pure bred "Sahiwal" (12%) and cross bred (L×F1; L×F2; L×F3; SL×F2) (67%). The average age of the cow was 94.9±33.7 months (n = 62) and milk production was 3.9±2 liter/cow/day (n = 60) which is coincided with the earlier workers (Hossain *et al.*, 2001; Sarder *et al.*, 1997; Rahman *et al.*, 1987). The parity number and age at first calving of a cow were recorded to be average 4±3 (n = 62) and 43±10 months (n = 61) respectively. The results obtained for milk production related to parity and age at calving are corresponded with the previous works (Sarder, 2001; Sarder *et al*., 1997; Singh *et al*., 1997; Majid *et al.*, 1995; Wilson, 1985). Days required for the first calve of a cow might be affected by geographical difference, genotype, level of management and nutritional status (Alam and Ghosh, 1988; Dobson and Alam, 1987). Proper management care with the optimal nutritional and appropriate season had been identified that could reduce the time required for the first calving (Oyedipe *et al.*, 1982).

Univariate analysis between milk production and explanatory variables

The younger cows (≤99 months) (65%) were 6.7 time more likely to have yielded >3 liters/cow/day than the older cows (>99 months) (35.2%) ($p < 0.001$). Cows calving at >41 months (54.1%) produced 1.6 times more milk (>3 liters/cow/day) than cows calving at ≤41 months (46%). However, the difference was not statistically significant ($p > 0.05$). Cows with ≤4 parities (89.2%) were recorded to have 7.6 times more chance to produce milk of >3 liters/cow/day than cows with ≥4 parities (10.9%) ($p < 0.001$)). The milk production of >3 liters/cow/day is 39.3 times higher in the crossbred (78.4%) than the milk production in the local breed (2.7%) ($p < 0.001$).

Positive correlation was recorded between milk production and age of the cows (Izaike *et al.*, 1984). It has been suggested that milk production potential increased with advanced ages, parities of cows and maximum yield recorded at parity number 4. The results corresponded with the earlier works done (Sarder, 2001; Izaike *et al.*, 1984). Genetic group specific milk production of dairy cows has been reported that local Friesian cross has yielded 5 liters/cow/day and local has given 3.4 liters/cow/day (Rahman *et al.*, 1987; Hossain and Mostafa, 1985; Bhuiyan and Sultan, 1994).

The result of the present study indicated that the milk production potential does vary among genotypes and this variation in milk production could also be accounted for the age of cow, age at which she first calved and the parities she belonged to. Selection of appropriate genetic merit through sound farm breeding policy, average age and parity distribution and ensuring early puberty and subsequent calving at early age could substantially favour a dairy farm to get economically viable and ensure minimum total milk output thereby. However, determinants like age and parity could be take place with different environment and managemental factors.

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