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Management vs Productive and Reproductive Performances of Dairy Farm

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Abstract: The study was conducted at dairy and cattle improvement farm, Hathazari, Chittagong for a period of one year. A total of 82 dairy cows were selected during the period from June 03-July 04 and their information regarding milk production upto 180 days, productive and other reproductive parameters were recorded from farm record book. Average milk production (459.09±138.09 liter), calving interval (634.59±223.92 days), age at puberty (1205.02±313.80 days), service per conception (1.88±1.09), gestation length (273.08±7.48 days) and birth weight of fetuses (18.78±34 kg) were observed. The minimum and maximum value of these results was also observed. The highest milk production (487.54±109.73 liter) was found in the cows with parity number 4-8 and the second highest (456.84±169.58 liter) was found with the parity number 2 and the lowest milk production (445.79±86.64 liter) was found with the parity number 3. The average production of milk was observed (473.44±134.15 liter) in the cows required interval between 370-590 days and 444.74±142.11 liter found in the cows required 591-1365 days. When the range of age at puberty was 1186-2270 days and 665-1185 days the average production of milk was 468.56±161.92 liter and 450.50±113.56 liter was observed, respectively. Comparatively more milk production was found (461.52±151.89 liter) in cows required less number of services per conception was 1-2 than the cows required more number of services per conception was 3-6 and their milk production was 452.84±96.60 liter. There was no any significance difference of production of milk among the different variables.

Key words: Management, productive, reproductive, milk yield

Introduction

In Bangladesh the total cattle population is about 24.4 million of which 11.49 million are female. Among the cattle population 3.53 million are milking cows and 2.61 million are dry cows (cows without milking)). Most of the dairy farms in rural and periurban areas of Bangladesh are small scale and each farm consists of 5-20 lactating cows. There are some non-government and government dairy farm that consists of 50-450 lactating cows (personal communication). In spite of our large number of cattle population, the production of calf and milk are insufficient as per our demand and requirement. Generally crossbred dairy cows produce from 600-800 liter milk per lactation of 210 to 240 days (Islam, 1992). The profit of dairy farm depends on the production of more calf and more milk from the dairy cows with optimum fertility management. Calving interval, age at puberty, service per conception, gestation length and birth weight of fetus are most important parameters to measure the farm economy. A farm with 13-15 months calving interval, 24 months for age at puberty, 1.33 services per conception and 5 kg milk per day per cow could be economically profitable (Azizunnesa, 2002). Milk production depends on the systemic management of dairy farm including proper feeding, breeding, housing and also taking preventive measure against diseases and parasitic infestations (source from internet). Milk production also depends on the parity. Azizunnesa (2002) stated that the milk production of subsistence dairy farm in Mymensingh was 3.2±2.2 kg per cow per day. The reasons for low production of dairy cows could be due to their poor genetic makeup, inadequate feeding, management, disease control programme, hot humid environments (Jabber and Green, 1998; Shamsuddin, 1988; Alam and Ghosh, 1988; Shamsuddin *et al*., 2001). Most of the farmers are illiterate and they are rearing their cattle with so called management system. It is also necessary to mention that more than 80% of the cattle population is being kept by the individual farmers in the rural areas under village management that is why the productivity is very low. On the other hand the demand for milk and milk products is rapidly increase in Bangladesh day by day.

Usually the production performances of cross-bred cows are better than local cows. For why at present the demand of cross bred cows are many times higher due to higher production of milk ranges between 8-15 liter/day and it is also profitable business in our country. But some constrains decline the rate of production ultimately decline the profit of the dairy farms due to lack of technology. So it is important to measure the different productive and reproductive performances of dairy farms for overall productive and reproductive pictures of farms and accordingly putting some recommendation to

Table 1: Measures of productive and reproductive traits of dairy cows at dairy and cattle improvement farm

Parameters	Mean±SD	Minimum	Maximum	No.
Milk production 180 days (liter)	459.09±138.09	144.00	1132.12	82
Calving interval (days)	634.59±223.92	370	1365	82
Age at puberty (days)	1205.02±313.80	665	2280	82
Service per conception	1.88±1.09	1	6	82
Gestation length (days)	273.08±7.48	262	290	82
Birth weight of fetus (kg)	18.78±34	12	34	82

improve the status. Therefore, the present study was carried out to describe the productive and reproductive performances of cross bred dairy cows at dairy and cattle improvement farm and to recommend suggestions for improvement.

Materials and Methods

Description of the farm: The cattle and dairy improvement farm, Hathazary, is one of the government dairy farm located in Hathazary upazilla under Chittagong district which was established in 1995. There were 382 cattle population in this farm during the period of 2003-2004 where in most of the cattle population was Friesian×Local. Very few numbers were Sahiwal×Local and Friesian×Sahiwal cow.

Management practice: Both stall and group feeding are being practiced round the year, where the common feedstuffs are grown in the own cultivable land. The frequency of supply of feed in thrice a day. Heat detection and insemination has been performed by own fixed stuffs. Frozen semen is used for AI. There is a culling system in this farm and heifer replacement for future reproduction. Unproductive cow having 4/5 parities or any other incurable diseases are normally culled and the vacant places are replaced by heifer for future reproduction. Animals are vaccinated against FMD, BQ and HS and also dewormed with broad-spectrum anthelmintics at 4 months interval.

Study design and data collection: A retrospective study was carried out on 82 lactating cows of the farm between June 2003 and May 2004. A structured questionnaire was developed to obtain the necessary information as per objectives targeted. The questionnaire included the following information: genotypes of the animals, average milk production per day per cow up to 180 days, total milk production per lactation up to 180 days, lactation length, calving interval, gestation length, service per conception, age at puberty (latest) and birth weight (last calving) of fetus were recorded in the questionnaire by record reviewing of the farm register with the help of farm manager. The main investigator took this responsibility in person to fill up the questionnaire.

Statistical analysis: The data were sorted and entered into Microsoft Excel 2000 and exported to the STATA 7.0^{R} (Stata corporation college, station) for statistical analyses. Descriptive analyses were done to perform the results in percentage, mean and standard deviation where applicable.

Results and Discussion

Milk production: The measures of different productive and reproductive traits were presented in Table 1.

The average milk production per cow up to 180 days was 459.09±138.09 liter and ranged from 144.00-1132.12 liters which is some extent similar to the result of Azizunnesa (2002). She found the average production of milk of subsistence dairy farm at Mymensingh district was 3.2±2.2 kg per cow per day for a lactation length. However the dissimilar result was reporting by Bhuiyan and Sultan (1994). They found the highest milk yield in Holstein Friesian cow was 10.41±0.17 kg per day for a full lactation period. He also found the average milk production per cow per day from crossbred and indigenous dairy cows was 4.10 and 2.28 kg, respectively. In adequate feed supply, lack of proper management, poor genetic makeup might be the possible causes of low milk production.

Calving interval: The present result showed the calving interval ranged between 370-1365 days. The average calving interval was 634.59±223.92 days. These results are not considered with the previous study of Uddin (2001). He found the highest calving interval of 472.55±169.27 days in indigenous cows and the lowest value of 413.77±53.87 days for Fx cows. For an economic profitable dairy farm, calving interval should be 365 days is considerable (Jainudeen and Hafez, 2001) but this study did not show the expectable calving interval.

Age at first puberty: As the farm economic depends on reproductive lifespan of dairy cows, so it is very important to shows estrous as early as possible for a heifer. By showing estrous as early as possible a female animal can contribute more on the reproductive point of view. In this study the average age at puberty was 1205.02±133.80 days. This result differs from Rahman (1993) and Asraf (1998) who recorded 33×30 = 960 days required for puberty of Fx heifer and 42×30 = 1210 days required for local×Fx heifer in other parts of Bangladesh.

Table 2: Measures of milk production up to 180 days in relation to different reproductive parameters

Variables	Category	Mean±SD (liter)	P value
Parity	2	456.84±169.58	0.64
	3	445.79±86.64	
	4-8	487.54±109.73	
Calving interval (days)	370-590	473.44±134.15	0.35
	591-1365	444.74±142.11	
Age at puberty (days)	665-1185	450.50±113.56	0.55
	1186-2270	468.56±161.92	
SPC	1-2	461.52±151.89	0.79
	3-6	452.84±96.60	

Service per conception: The minimum number of service per conception is one of the indicator of economically profitable dairy farm. The average service per conception of studied farm was 1.88±1.09. The number of service per conception in a dairy farm should be maximum 1.33 (de Kruif, 1978). The present result agrees in some extent with the result of Azizunnesa (2002). She observed an average service per conception of subsistence dairy farm was 1.5. In the other experiment by Shamsuddin *et al.* (2001) showed an average service per conception of 2.2 in some selected parts of Bangladesh.

Gestation length: Average gestation length was 273.08±7.48 days which is consistent with the findings of Mondal (1998). He reported an average gestation length for Holstein cross was 275.15±3.95 days. Gestation length of this study might have been varying because of seasonal and manage mental variability of the farm.

Birth weight of calves: The desired level of birth weight of calves is most important for faster growth of heifer to show estrous as early as possible. The Table 1 showed an average birth weight of calves was 18.78±3.57 kg which is almost the same findings of Rahman (1999) and Khan *et al.* (2000). Rahman found an average birth weight of F, Sahiwal×F and local calves were 32.00±5.83, 22.34±3.81 and 29.09±5.70 and 21.03±3.36 kg, respectively. While Khan reported an average birth weight was 17.28±0.76 and 16.00±1.52 kg for farm condition and rural Red Chittagong calves respectively. The reason of low birth weight could be due to nutritional deficiency, any disease condition of mother as well as fetuses or early delivery of fetuses.

The Table 2 showed the effect of some variables on milk production.

The average milk production per cow for 180 days was highest in 487.54±109.73 liter, the cows having 4-8 parity while the average production of milk was in between 456.84±169.58 and 445.79±86.64 liter in cows having 2nd and 3rd parities, respectively. However, the difference of milk production among different parities was not statistically significant. This result agrees with Sarder *et al.* (1997). They reported that parity had significantly effect on milk production and they found more milk in cows with greater parities than those with lesser parities (6.0 vs 7.0 to 7.5 kg for 1st vs 4 to 5th parity). This result also support by Sainz *et al.* (1992). They observed that daily milk yield is maximized when cow aged at 53.90 to 69.67 months. The highest amount of milk (7.7 kg /day) was produced by cows at an age of >84 to 144 months old stated by Sarder *et al.* (1997).

Calving interval: The result showed an average production of milk up to 6 months was 473.44±134.15 and 444.74±142.11 liter by the cows those having calving interval 370 to 590 and 591 to 1365 days, respectively. In this experiment comparatively more milk production was found from cows having minimum interval between calving. However this result is not statistically significant. Longer the calving interval looser the reproductive life, ultimately farm owner looser economically. It is observed that less milk production found when the cows with long calving interval. The author think, the causes behind this less milk production were various reproductive disorders in the post partum period.

Age at puberty: The average milk production/cow was highest in 468.56±161.92 liter, the cows taking long time to shows 1st estrous. On the other hand comparatively less production of milk was found from those cows taking less time to shows 1st estrous. The observed analysis showed that there was no significance difference of milk production among the age at puberty. Islam (2000) reported the average milk production is affected by age at first puberty.

Service per conception: The maximum milk production was found 461.52±151.89 liter from cow's required minimum number of services for conception (1-2) and comparatively lower production of milk was found from cows required higher number of services per conception was 3-6. The differences production of milk among service per conception is not significant statistically. It is observed that cows with less milk production required more number of services for conception and long time for inter calving interval. It indicates that postpartum management was not good for this farm.

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