

Abstract

The study was done to find out the milk production performance of different genetic groups of crossbred cows at different farming condition in Chattogram, Bangladesh. The data were collected from some selected dairy farms of Chattogram area. On the basis of farm size six farms were selected and then only milching cows are selected by their specific blood percentage and that is 50% H.F. × 50% Sahiwal. The data were collected by questioner and the main focus given on milk yield, lactation yield, and lactation length. The study period was 5 months and then these data were input into MS-excel and then analyzed into STATA software. The result says that the average milk production of the selected cows which has genotype 50% H.F. × 50% Sahiwal is 13.01 litre milk per day, which minimum level is 10 litre and maximum level is 16 litre. Then, secondly the average lactation length is 221 days and average milk yield per lactation is 2890. The dairy farmers of Chattogram wants to make cows dry earlier because they observe that they get more milk by this method. The highest daily milk yield (DMY) was found in those farms having good management practice, modern rearing system, supply of proper nutrition, trained and skilled farm owner.

Introduction

Livestock plays an important role for the food security of the people of Bangladesh (DLS, 2006). Livestock is the important components for the source of animal protein. However, their present contribution to the nutritional statistics for Bangladeshi people is too low, the reasons behind this socio-economic condition of the people, absence of a comprehensive livestock development policy and strategy. Livestock sub-sector to the GDP was 7.23 percent, which was estimated about 17.32 percent GDP to agriculture. (*Source: Economic Review-2006*).

Dairy farming is a part and parcel of integrated farming system in Bangladesh (Saadullah, 2001). There is many commercial dairy farms in Bangladesh. The major part of milk is produced in the farms located in rural area. Local cows are our resource. Their milk quality is good but the productive and reproductive status is not satisfactory. Consequently, the concept of crossbred and commercial dairy farming has been come under consideration forward. It was reported that, the number of dairy cow in Bangladesh is 3.98 millions which is 16% of total cattle population and 35 % of our cows. Only 10% of cattle are reported to be crossbred (BBS, 2012). Bangladesh is importing powder milk with a view to meeting depicts. The volume of imported powder milk has been increased over the year due to increased domestic demand. The cost of importation has exerted pressure on the country's balance of payment and depressed domestic initiative for milk production. Moreover, about two third of total population are suffering from malnutrition. The magnitude of malnutrition can substantially be reduced by consumption of milk and dairy product (FAO, 2007).

The economic condition of a dairy farm depends to a greater extend on productive and reproductive performance of animal. The productive performance is considered as milk yield per lactation per cow, average lactation length of different genotype. The reproductive performance is considered as age at first heat, age at first calving, service per conception, gestation length, calving interval, days open. Prolong days open and low conception rate are the major constraints limiting the dairy farming in Bangladesh (Rokonuzzaman et al., 2009, Alam and Ghosh, 1999 and Shamsuddin et al., 2001).

The average production of local dairy cow is low which varies between 300 to 400 liters in a lactation period of 180 to 240 days. But there is a great variation of production among cows. Generally crossbred cows under village condition yield 600 to 800 liters milk per lactation period of 210 to 240 days (Uddin, 2008). The low productivity of milking cow in this country is due to scarcity of feed and fodder land, poor genetic potentiality and wide extend of diseases. Sustainable dairy farming is not possible with indigenous cow because of their low productivity. For this reason, the concept of intensive farming with high yielding cows has established. The daily per capita availability and requirement of milk are estimated in adult 34.86 ml and 250 ml (DLS, 2009). To increase the number of crossbred animal, central cattle breeding and dairy farm (CCBDF) was established. The number of crossbred animal is being increased day by day with the spread of artificial insemination (AI). A good number of small, medium and large size farm has been developed mostly in urban and semi urban milk pocket areas like Pabna, Sirajgonj, Munsigonj, Manikgonj, Faridpur, Madaripur, kishorgonj, Rangpur, Kustia and Chittagong district (Rokonuzzaman et al., 2009).

The total cattle population of Bangladesh is 22.87 million where 3.79 million is dairy cows yielding 1.64 million metric ton milk per year which is only 14% of the total requirements (Banglapedia2014). It indicates there is a great shortage of milk production in our country (Banglapedia 2014). Increased milk production strategy is establishment of dairy enterprise in which small scale farmers can successfully engage in order to improve their livelihood (Hemme et al. 2005).

Normally the production status of cross-bred cows are better than local cows. The demand of cross-bred are many more times higher because of their higher production of milk ranges between 8-15 liters/day and it is also a trending business (Asian journal of medicinal biological research, vol. 1 2015).

The farming and management system is not so develop in this area. Different types of dairy cattle such as Holstein cross; Sindhi cross, Sahiwal cross, and local cattle are available in this area. The backyard and smallholder farms with poor managerial facility are the major issue for hindering the production. However, potential of the available breeds due to lack of initiative and facility very little study was conducted in this area to determine the heritability of milk production unfortunately due to lack of initiative and facility there is no study yet conducted in

this area to determine the heritability of milk production in relation of management. Therefore the present study was conducted with the following objectives.

Chittagong is now in a very satisfactory position on dairy farming contrast. More or less, majority farms are in beneficial condition & contribute in national financial system. The husbandry practices of these farms are very important issue. For determination the actual condition of this dairy farms various parameters like housing, feeding, breeding, biosecurity & heath care management that mean the overall husbandry status need to evaluate Most of the farming is mixed type. They rear 2-3 types cross. So the actual performance of milk production by specific cross determination in Chattgram area is necessary. The main objectives of this study is-

- 1.To observe the milk production performance including daily milk production,lactation milk yield and lactation length of 50%H.F. ×50%Sahiwal.
- 2.To compare the milk production status of some selected dairy farms in Chattagram for 50%H.F. ×50%Sahiwal.

MATERIALS AND METHODS

1.1 Study area: My study area was Chattogram city corporation in where I selected some dairy farms on the basis of farm size. Chattogram is the largest division of Bangladesh .

1.2.Study period: The study was conducted from 8th December 2018 to 20th April 2019 (Near about 4.5 months)

1.2 Farm selection: Farm is selected basis on 25-60 cows reared and they have specific three types of cross which are 50% HF& 50% L, 75% HF& 25% L, 50% SL&50%HF . I have selected total 6 dairy farms in Chattagram metropolitan area.

1.3 Animal selection: Cows are selected by there cross. Only milching cows are selected which has the blood percentage 50%H.F. ×50%Sahiwal. I sure this genotype by their pedigree information, breeding data, farmers interview and from morphology and milk production. The main sources of data for cows blood percentage are below-

- I. Farmer say that some of cows they bought 100% L and then they cross with it 100% HF and then they receive such genotype.
- II. And some of cows are they bought 25% HF cows with rest percentage local and then did AI with 75% HF.
- III. Others cows genotype I confirmed by their morphology and milk production.

I have selected total 33 cows from selected 6 dairy farms

1.4 Data collection: I made a questionnaire to ask the farmers about the specific data of that cows. The questionnaire was developed related with objectives of the study. It was designed in a simple way to get accurate information from the dairy farmers. The questionnaire contained following informations:

General information's-

Farm name

Total no. of cows

Distribution of genotype

Total no. of 50% H.F. × 50% Sahiwal

Individual records-

Body weight

Daily feed intake

Daily milk production

Age

No. of lactation and length of lactation

Managerial information's-

Housing system

Floor condition

Hygiene

Diseases

Milking method

Feeding system

1.5 Data analysis: The collected data was compiled, tabulated and analyzed in accordance with the objectives of the study. At first it has input into the MS excel(2007) and then data were subjected to the Microsoft Excel (2011).

RESULT

3.1 Size of farms: I have selected 6 dairy farms on the basis of farm size. The farms are aziza, zorip, bondhon, modern, moin and vuia. The number of total cows in those farm are 183. Among them vuia has the highest number of cows which are 50 in number. Following graph represents the size of farm-

Name of the dairy farm in Chattogram	Selected cattle number
Azizia	25
Zorip	20
Modern	18
Bondhon	25
Moin	45
Vuia	50

Table no.1 : No. of dairy farms selected on the basis of farm size from Chattogram metropolitan area

3.2 No. of cows selected from farms: In the selected dairy farms I have choosed only those cows which has 50% H.F. × 50% Sahiwal genotype. Among them azizia farm has the highest number selected cross.

Name of the farm	Selected no. of animal
Azizia	13
Zorip	4
Modern	3
Bondhon	4
Moin	5
Vuia	4

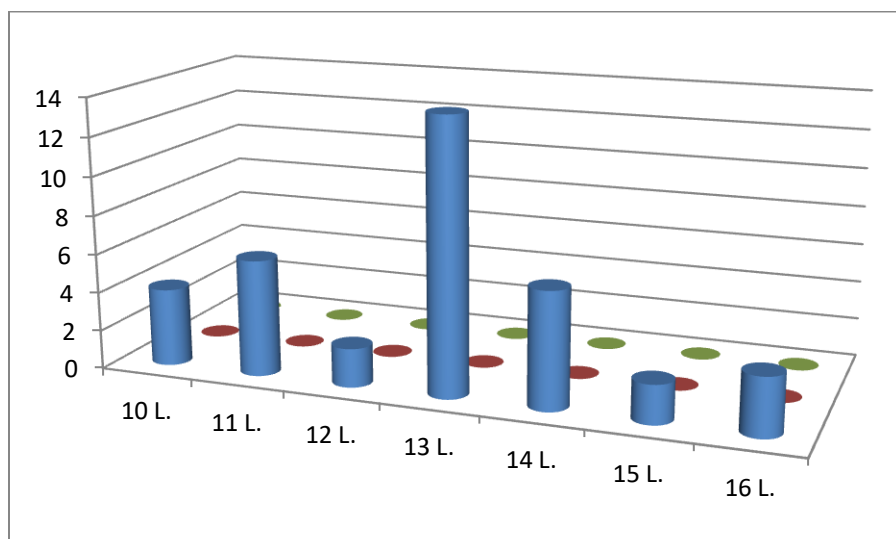
Table No.2 : No. of dairy cows selected from 6 dairy farms

3.3 No. of cow's on lactation number: I have collected individual data of all selected cows. I collected data of running lactation period and previous lactation period. All cows are in 5th lactation to 2nd lactation period. Among them most of the cows are in 3rd lactation period.

Lactation Number	No. of dairy farms
2	8
3	14
4	12
5	3

Table no.3 : No. of dairy cows on the basis of lactation number

3.4 No. of cows basis on average milk production: Average milk production of the cows are 13.01 litre. Upper limit is 13.35 litre and lower 12.67 litre. But most of the cow's milk yield is 13 litter per day.



Graph. No.1: of dairy cows on the basis of average milk production

3.5 Descriptive statistics for production traits of the farm:

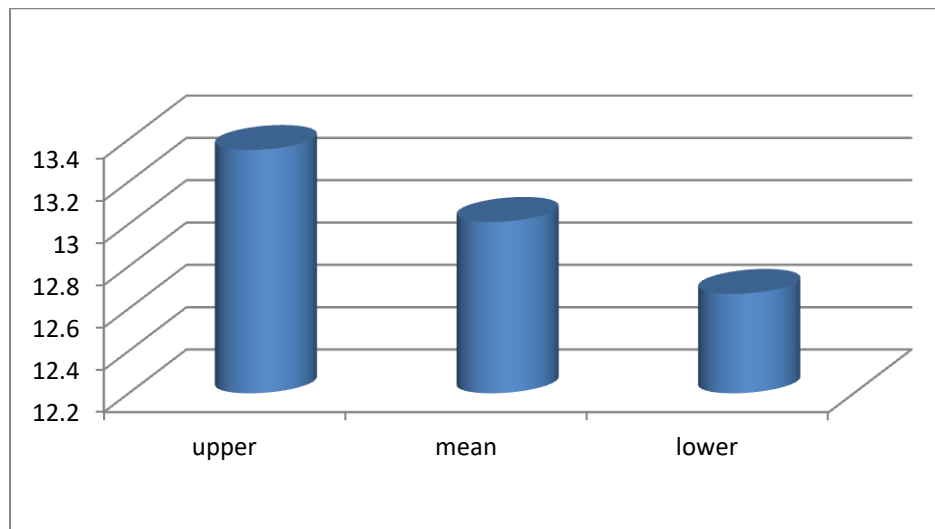
From the milk production history of 6 selected dairy farms following findings were observed-

The upper, lower and mean value for daily milk production of the cows in litter are following-

Trait	Value
Upper	13.35
Mean \pm SD	13.01 \pm 1.70
Lower	12.67

Table no. 4- Daily milk production of 6 selected dairy farms

This data were analyzed by STATA software. Here total number of selected cows were 33 with 95% confidence interval and the minimum value is 10 and maximum value is 16. So the average milk yield of 50%H.F. \times 50%Sahiwal is 13.01 litre. Following graphs represent the statistics-



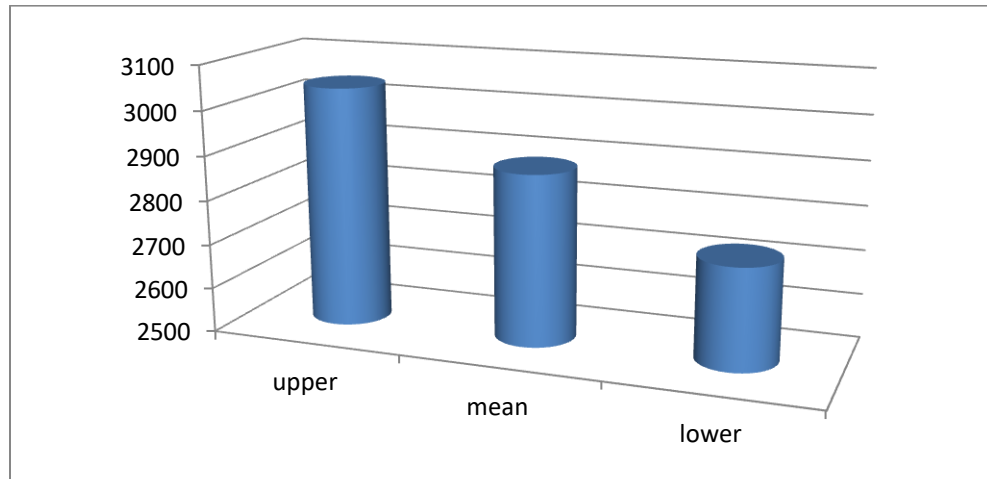
Graph no. 2- Daily milk production value of 6 selected dairy farms

Now, upper, lower and mean value for milk production in per lactation in litter are describing follow in table-

Trait	Value
Upper	3040.44
Mean \pm SD	2890.19 \pm 745.53
Lower	2739.93

Table no. 5- Milk production in per lactation in litre

All cows are in 2nd to 5th lactation and here confidence level is 95%. Maximum value is 4320 and minimum value is 1000 litre. Minimum value is much lower because some are incomplete lactation period. Following graphs represent the statistics-



Graph no. 3– Milk production in per lactation in litter

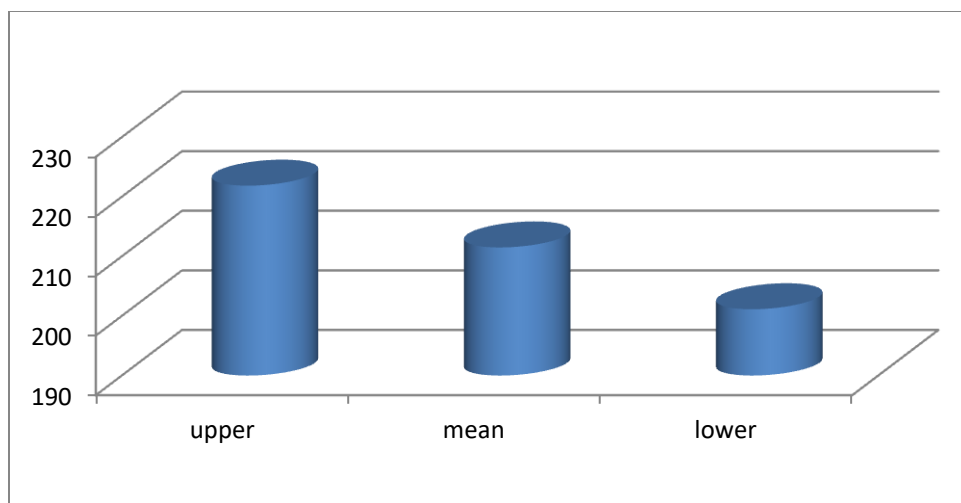
From the data it is found that milk production become higher in the 2nd and 3rd lactation period. Between them in 3rd lactation production of milk is highest.

Next, upper, lower and mean value of lactation length in days of selected cows are describing follow in table-

Trait	Value in days
Upper	231.04
Mean± SD	221.52±47.25
Lower	211.99

Table no. 6– Lactation length in days of selected cows

Here maximum value is 280 days and minimum value is 100 days with 95% confidence level. Minimum value is very low because of incomplete lactation. Following graphs represent the statistics-



Graph no. 4– Lactation length in days of selected cows

3.6 Mean of milk production traits according to the farm:

Now mean value, standard deviation and F value of daily milk yield(litter/day) of cows are describing following table-

Farm name	No. of cows	Mean	Std. dev. value	F- value
Azizia	13	11.76	1.37	8.78(**)
Zorip	4	13.75	1.04	
Modern	3	12.60	1.65	
Bondhon	4	13.94	1.52	
Moin	5	14.50	1.22	
Vuia	4	12.56	1.53	

Tab. no.7- Daily milk yield (litre/day) according to the farm

Here this F value is significant and P value is less than 0.01. Here findings say that among the farms Bondhon has higher milk yield value where Vuaia has lower milk yield value.

Next mean value, standard deviation and F value of Yield per lactation (litter) of cows are describing following table:

Farm name	No. of cows	Mean	Std. dev. value	F- value
Azizia	13	2668.24	633.47	1.34(**)
Zorip	4	3067.50	943.14	
Modern	3	3088.00	435.88	
Bondhon	4	3021.76	890.02	
Moin	5	3147.14	787.54	
Vuia	4	2720.93	706.84	

Tab. no.8- Yield per lactation (litre) according to the farm

Here this F value is significant and P value is less than 0.01. Here findings say that among the farms Zorip has higher milk yield value per lactation where Vuaia has lower milk yield value per lactation.

Then the mean value, standard deviation and F value of lactation length (days) of cows are describing following table:

Farm name	No. of cows	Mean	Std. dev. value	F- value
Azizia	13	225.81	43.45	0.71(non-significant)
Zorip	4	221.25	61.75	
Modern	3	245.50	19.50	
Bondhon	4	216.18	56.78	
Moin	5	217.86	52.80	
Vuia	4	214.63	44.09	

Tab. no.9- Lactation length (days) of cows according to the farm

Here this F value is non-significant . This is may be due to false information given by the farmers. Here findings say that among the farms Zorip has higher lactation length value where Vuaia has lower lactation length value. Normally in farms they try to maintain dry cows and fry period because they observed that if dryness maintain properly milk yield increase. And so they try to make cows dry earlier.

Discussion

According to DLS, Chittagong, the researchers measured foreign blood of the cross cows by their amount of milk yield. According to their observation, up to 5L of milk contains 12.5% of H.F or Sahiwal, 6-8L of milk contains 25% of HF or Sahiwal, 9-10L of milk contains 37.5% of HF or Sahiwal, 10-15L of milk contains 50% of H.F or Shahiwal, 16-20L of milk contains 62.5% of HF or Sahiwal, 21-25L of milk contains 75% of HF or Sahiwal, 26-35L of milk contains 87.5% of H.F or Sahiwal, 35-40L of milk contains 93.75% of H.F or Sahiwal, 41-45L

of milk contains 96.88%-100% of HF or Sahiwal. This report is partially support this study. Because from the above result it is observed that the daily milk yield of 50% H.F. ×50% S. is average 13.01 litter and minimum level is 10 and maximum level is 16. So the result of this report partialy support DLS study.

The overall lactation length of 100% Holstein Friesian cows is 317 days(Ayalew *et al* , 2015). Accordng to(Sandhu *et al* ,2011) it is 314 days. In this report selected blood percentage were 50& H. F. ×50 % S. and lactation length found 221 days. As it is 50% H.F. it is supported by above article. Because farmers try to make cows dry earlier to get more milk.Also some difference are found and it may be for the difference in parity, data edition, environmental variation and management of the farm.

The average milk yield in per lactation is 2890 litter which is similar to the result of Department of Livestock Service. The dairy farmers of Chattagram normally make cows dry earlier because they notice that they get more milk by this method.

Limitations:

1. Sometimes farmers feel annoyance to give information.
2. Time was too short to collect the data.
3. Body weight of cattle was taken by formula because there is no weighing machine.
4. Sample was too short to accurate result.
5. Sometimes farmers do not want to give accurate result of milk yield.

Conclusion

The dairy farms situated in Chattagram metropolitan area are used cross of Holstein Frisian and local breed. Among them one of is 50% Holstein Frisian and 50% Shahiwal. Their average production performance is 13.01 litter milk per day which is good in the considering price and other factors of the market. Some farm has greater production though same genotype and it may be due to variation of feeding and manage mental factor. Result say that their average lactation period is around 221 days and their opinion is it is good for their cows because by applying this they get expected milk yield. And the highest milk production is obtained from 3rd lactation which decrease in later lactation.

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The author,
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Biography

I am Al-Amin, son of Mezbah Uddin and Anawara begum. I passed Secondary School Certificate examination in 2010 from Kutikura Karuapara High school followed by Higher Secondary Certificate examination in 2012 from Anandomohon College, Mymensingh. Now I am an intern veterinarian under the Faculty of Veterinary Medicine in Chittagong Veterinary and Animal Sciences University. In the future, I would like to work as a veterinary practitioner and do research on clinical animal diseases in Bangladesh.