

Study on Productive and Reproductive Performance of Different Dairy Cows under Farm Condition at Chittagong Metropolitan Area



By:

Sreekanta Biswas

Roll No: 12/22; Reg No: 00742

Intern ID: C-21

Session: 2011-12

Production report submitted in partial satisfaction of the
requirements for the degree of

Doctor of Veterinary Medicine (DVM)

Faculty of Veterinary Medicine

Chittagong Veterinary and Animal Sciences University

Khulshi, Chittagong-4225, Bangladesh

December, 2017

Study on Productive and Reproductive Performance of Different Dairy Cows under Farm Condition at Chittagong Metropolitan Area



Production report submitted as per approved style and content by

Signature of supervisor

(Dr. Omar Faruk Miazi)

Associate professor

Department of Genetics and Animal Breeding

Chittagong Veterinary and Animal Sciences University

Date:

Faculty of Veterinary Medicine

Chittagong Veterinary and Animal Sciences University

Khulshi, Chittagong-4225, Bangladesh

December, 2017

Table of Contents

Contents	Page No.
Table of Contents	03
List of Tables	04
List of Graphs	04
List of Abbreviations	05
Abstract	06
Chapter 1: Introduction	07-09
Chapter 2: Materials and methods	10-12
2.1 Selection of a study area	10
2.2 Study population	10
2.3 Duration of study	10
2.4 Preparation of questionnaire and pretesting	10
2.5 Methods of data collection	11
2.6 Problems of data collection	11
2.7 Statistical analysis	12
Chapter 3: Results & Discussion	13-22
3.1 Productive performance	13-16
3.1.1 Milk yield	13-14
3.1.2 Average lactation length	15-16
3.2 Reproductive performance	17-22
3.2.1 Age of puberty	17-18
3.2.2 Gestation peroid	19-20
3.2.3 Intercalving period	21-22
Limitations	23
Conclusion	24
References	25-27
Acknowledgements	28
Questionnaire	29
Appendix	30-33
Biography	34

List of tables

Table No.	Title	Page No.
Table 1	Milk production of different dairy breeds under farm condition	13
Table 2	Lactation length of different dairy breeds under farm condition	15
Table 3	Age of puberty of different dairy breeds under farm condition	17
Table 4	Gestation period of different dairy breeds under farm condition	19
Table 5	Intercalving period of different dairy breeds under farm condition	21

List of Graphs

Graph No.	Title	Page No.
Graph 1	Average milk yield of different dairy breeds under farm condition	14
Graph 2	Average lactation length of different dairy breeds under farm condition	16
Graph 3	Average age of puberty of different dairy breeds under farm condition	18
Graph 4	Average gestation period of different dairy breeds under farm condition	20
Graph 5	Average Intercalving period of different dairy breeds under farm condition	22

List of Abbreviations

Abbreviation	Elaboration
L/day	Litter/day
L	Litter
L x S	(Local x Sahiwal)
S × F	(Sahiwal x Friesian)
L × F	(Local x Friesian)
S.E	Standard Error
Vol.	Volume
No.	Number
Average	Average
F x Pabna	Friesian x Pabna

ABSTRACT

The experiment was done to monitor the comparative study on productive and reproductive performance of different dairy cows under farm condition. For achieving this goal 100 dairy cows were selected from different place of Chittagong metropolitan area. The data collected from different place such as Bayezid, Nazumiar hat, Baklia, Potenga, Baluchora etc. The productive and reproductive parameters of 100 cows of different breeds such as Local non descriptive, Local x Shahiwal, Local x Holstein Friesian, Holstein Friesian x Shahiwal were investigated and evaluated for productive and reproductive performance. The study found that the productive parameters of Holstein Friesian x Shahiwal cross breed showed the highest average milk production (15.184 ± 0.418 L) whereas the lowest average milk production found in local breed (2.548 ± 0.121 L). Besides, Holstein Friesian x Shahiwal showed the highest average lactation length (324.76 ± 2.645 days) and local breed showed the lowest average lactation length (205.16 ± 2.194). In case of reproductive parameters, the Local x Holstein Friesian cross breed showed the lowest average age of puberty (24.92 ± 1.186 months) whereas Local x Shahiwal showed the higher age of puberty (29.6 ± 1.099 months). The average gestation period of Holstein Friesian x Shahiwal cross breed found (280.92 ± 0.785 days) which is almost similar to the other cross breed and local breed. The Holstein Friesian x Shahiwal cross breed showed the lowest average intercalving period (16.64 ± 0.443 months) than the lowest average intercalving period observed in Local x Shahiwal cross breed (21.6 ± 0.516 months). Considering all the parameters studied, Holstein Friesian x Shahiwal crosses productive and reproductive performances are superior to other crosses. At present study it may be concluded that Friesian x Shahiwal crosses show better performance followed by local non descriptive, Local x Shahiwal, Local x Holstein Friesian.

Key words: Milk production, lactation length, age of puberty, gestation period, intercalving period.

CHAPTER 1: INTRODUCTION

Geographically, Bangladesh is a Agro-based developing country. Though it is small country, but the population is not so at all. More than 40% of people live under the poverty line and two-third of total population are suffering from malnutrition.

Livestock is a major component of agriculture and present livestock population is estimated to be 23.79 million cattles, 1.47 million buffaloes, 25.76 million goats, 0.33 million sheeps and 268.34 million poultry (DLS, 2015-16). Bangladesh has high density cattle population. The relative density of the cattle population is well above the averages found in many other countries of the world. It ranks 12th in cattle populations in the world and third among Asian countries (Alam *et al.*, 1994). Despite such a highly dense cattle population, the country has been deficient in milk, meat and draught power for quite some time. Dairy cows are the major livestock in Bangladesh and play very crucial role to our national economy. Apart from their role in milk production, they also contribute a huge quantity of organic manure on our agricultural field, which is one of the major inputs in our agriculture. Dairying is one of the most effective instrument for supplementing farmer's income and generating employment in rural sector (Bedi, 1989).

The majority of the dairy cattle are in the hands of small holder dairy producers. The country has one of the highest cattle densities of 145 large ruminants/square kilo meter (sq.km) compared with 90 for India, 30 for Ethiopia, and 20 for Brazil (Karim, 1997). The numbers of dairy farms are estimated at about 1.4 million with an average herd size of 1-3 cows (Hemme 2008). Also dairying is part of the mixed farming systems in Bangladesh (Saadullah 2001) and a predominant source of income, nutrition and jobs (Miyani 1996; Haque 2009). Dairying is also considered a strong tool to develop a village micro economy of Bangladesh (Shamsuddin *et al.*, 2007) in order to improve rural livelihoods and to alleviate rural poverty. More regular cash income can be generated through market-oriented dairies and more employment per value added unit has been observed in dairying than in crops (Asaduzzaman, 2000; Omore *et al.*, 2002).

In the last few decades, attention was mainly given to produce more cereal crops to gain food sufficiency for crops, whereas livestock was given low priority. In spite of being the most promising sub-sector of agriculture, livestock was deprived from Government initiative of improvement. However, livestock plays a crucial role in nutrition and income generation. The magnitude of contribution of livestock sub-sector to the GDP of this country is about 2.95% (GOB, 2004) and to agricultural GDP around 17.32%. This branch generates 17% of the total foreign exchange earnings (BBS, 2003) and provides fulltime employment of 27% and part time employment of 55% of the population (GOB, 2004). The result of ignorance to livestock showed by the Govt. has resulted in the annual shortage of milk by 10.2 million metric ton (www.dls.gov.bd)

The cattle resources of Bangladesh are mostly of the indigenous type (*Bos indicus*) with a substantial number of Sindhi, Sahiwal, Jersey and Holstein-Friesian crossbreeds. Indigenous cattle experience late maturity, short lactation length, long calving interval and poor production of milk and draught power but are more disease resistant and capable of thriving in harsh conditions (Majid *et al.*, 1992).

The economic condition of a dairy farm totally depends on productive and reproductive performance of the animals. The reproductive parameters are considered as, age at first calving, gestation period, days open, services per conception and calving interval where as production parameter considered as milk production per day per cow and the lactation length of a cow. The local cows are easy to handle, and manage. Feed cost is comparatively lower and they are more resistant to diseases, but their productive and reproductive performance are low. On the other hand, high yielding foreign breeds normally do not have adequate resistance against the prevalent of diseases. In order to overcome this problem suitable crossbreeds are developed in this country through proper selection and up grading. And some people have shown interest to developed intensive dairy farms recently growth of dairy farms is quite slow in Bangladesh. In our country very limited works carried out regarding productive and reproductive performance of dairy cows. To interpret productive and reproductive performance it needs more work in farm condition.

.

Objectives:

So, the present study was undertaken to evaluate the productive and reproductive performance of different breeds under farming condition at Chittagong metropolitan area.

CHAPTER 2: MATERIALS AND METHODS

2.1 Selection of a study area:

Selection of a study area is an important step for the study to achieve the objectives. The present study was conducted only in Chittagong metropolitan area. Under the study the following consideration taken as vital point:

- The area is blessed with the better communication facilities.
- Availability of dairy farm in that particular area.
- Expectation of co-operation from the respondents so that reliable data might be obtained.

2.2 Study Population:

About 100 cows of 4 different breeds were selected. They are as follows Local Non Descriptive, Local X Sahiwal, Local X Friesian, Friesian X Sahiwal.

2.3 Duration of study:

The study was conducted in different dairy farms in different areas of Chittagong metropolitan area actually from 07 August to 24 November in the study area.

2.4 Preparation of questionnaire and pretesting:

The requisite primary data for this study were collected through survey method. For collecting the necessary data questionnaire/interview schedule was prepared in the light to the objectives of the study. The questionnaire was pretested and then finalized. The respondents were given information related to the objectives of the study as well as their role. If any item overlooked and misunderstood or found contradictory, there was corrected through reinterviewing on the spot.

2.5 Methods of data collection:

Reliable data are directly related to the success and validity of the study. By using questionnaire/interview schedule most of the data are collected by myself. To obtain the reasonable and accurate data, visited several times in the study area. During data collection the objectives of the study were clearly explained to the respondents so that they could respond freely. Question was asked systematically and explanation was given wherever necessary. I have collected raw data on the basis of some productive and reproductive parameters of the Local Non Descriptive, Local X Sahiwal, Local X Friesian, Friesian X Sahiwal from different dairy farms.

Productive parameters are as follows-

- * Average milk yield
- * Lactation Length

Reproductive Parameters of my study are-

- * Age of puberty
- * Gestation period
- * Intercalving period

2.6 Problems of data collection:

- Most of the dairy farm owner thought that the investigator was an agent of the government authority and therefore they initially did not want to co-operate. In fact they hesitated to answer some questions relating to income and asset, because they were afraid of tax imposition or tax increase.
- Literacy of the respondents was great hindrances of data collection. Sometimes they could not answer the question accurately and to the point.

2.7 Statistical Analysis:

After data collection from selected farms data were organized, structured and analyzed by using both tabular and graphical method as well as using simple descriptive statistical tools and techniques by using Microsoft Excel 2007.

CHAPTER 3: RESULTS & DISCUSSION

The total recorded data for knowing productive and reproduction performance are shown in the tables-1, 2, 3, 4 and 5 for better understanding.

3.1: Productive Performance:

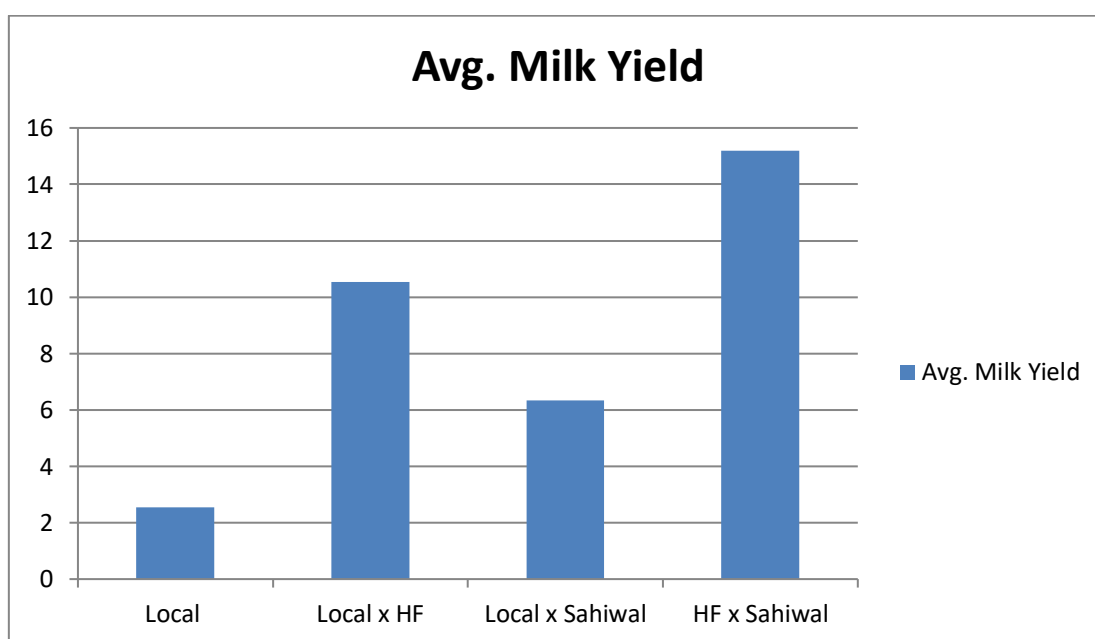
3.1.1 Milk Yield:

In this study, the highest milk production found in Holstein Friesian x Sahiwal cross breed (15.184 ± 0.418 liters) and the lowest milk production found in local Non Descriptive breed (2.548 ± 0.121 liters).

Table: 1: Milk production of different dairy breeds under farm condition

Breeds	No. of Animal	Mean Milk Yield (L/day/cow)	Standard Error (S.E)	Maximum Milk Yield (L/day/cow)	Minimum Milk Yield (L/day/cow)
Local non descriptive	25	2.548	0.121	3.5	1.5
Local x Holstein Friesian	25	10.532	0.444	14.5	7.5
Local x Sahiwal	25	6.328	0.241	8.0	4.5
Holstin Friesian x Sahiwal	25	15.184	0.418	18	12

The breed Friesian X Sahiwal was shown the better efficiency in milk production. In this case, the average milk production of Friesian X Sahiwal is 15.184 liters which is 4.5 liters more than the result of Islam (1999). That may be due to the managerial practice. The result of the present study agrees with the work of Halim (1992), who found that the average milk production of crossbred dairy cows was 11.09 L/day. Similarly Kabir *et al.*, (2009) reported that the the average daily milk yield of Local x Friesian graded animals were 12.03 ± 3.73 L/day and Nahar *et al.*, (1992) found 7.5 ± 0.1 L/day. Although milk production of crossbred cows of our experiment agrees more or less with the findings of above author. This result indicates that crossbred dairy cows are better in our country condition. (Bhuiyan *et al.*, 1994)



Graph 1: Average milk yield of Different dairy breeds under farm condition

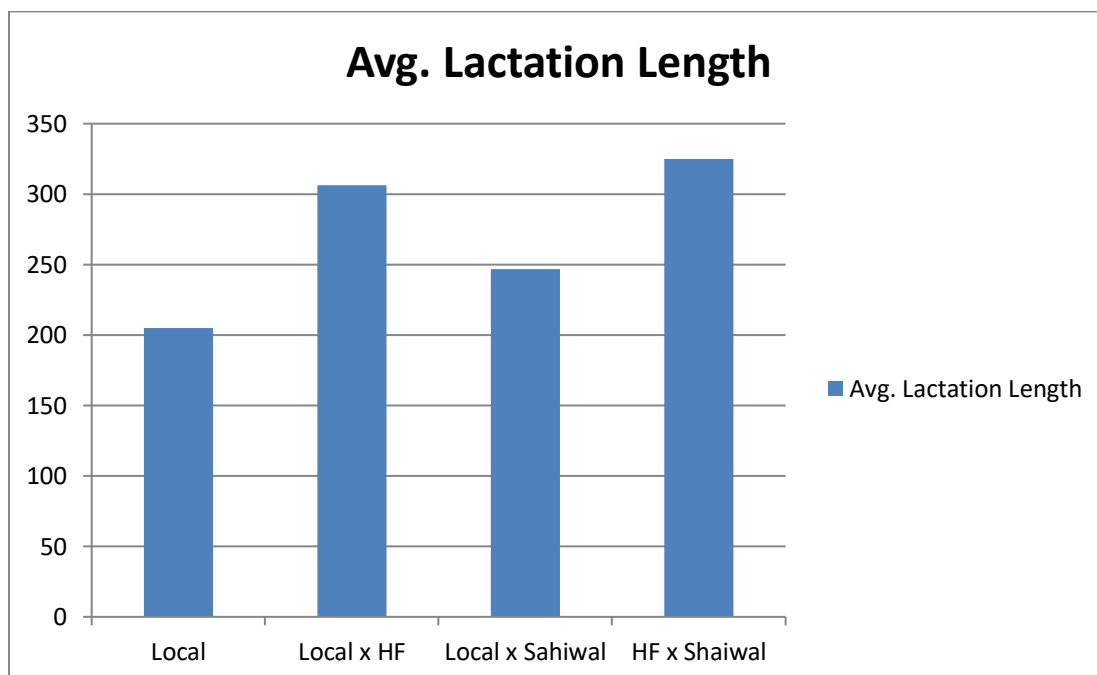
3.1.2: Average Lactation Length

In this study the highest average lactation length found in Holstein Friesian x Sahiwal cross breed (324.76 ± 2.645 days) and the lowest average lactation length found in local Non Descriptive cattle (205.16 ± 2.194 days).

Table 2: Lactation length of different dairy breeds under farm condition

Breeds	No. of Animal	Mean Lactation Length (Days)	Standard Error (S.E)	Maximum Lactation Length (Days)	Minimum Lactation Length (Days)
Local non descriptive	25	205.16	2.194	220	185
Local x Holstein Friesian	25	306.48	2.772	327	280
Local x Sahiwal	25	246.6	2.527	268	225
Holstein Friesian x Sahiwal	25	324.76	2.645	350	300

Dalal *et al.* (1991) reported that parity has the significant effect on lactation length. Similar thing happened to cross-bred and indigenous lactating cows where longer lactation length (250 days and 220 days respectively) achieved in forth parity where daily milk yield also highest in amount.



Graph 2: Average lactation length of different dairy breeds under farm condition

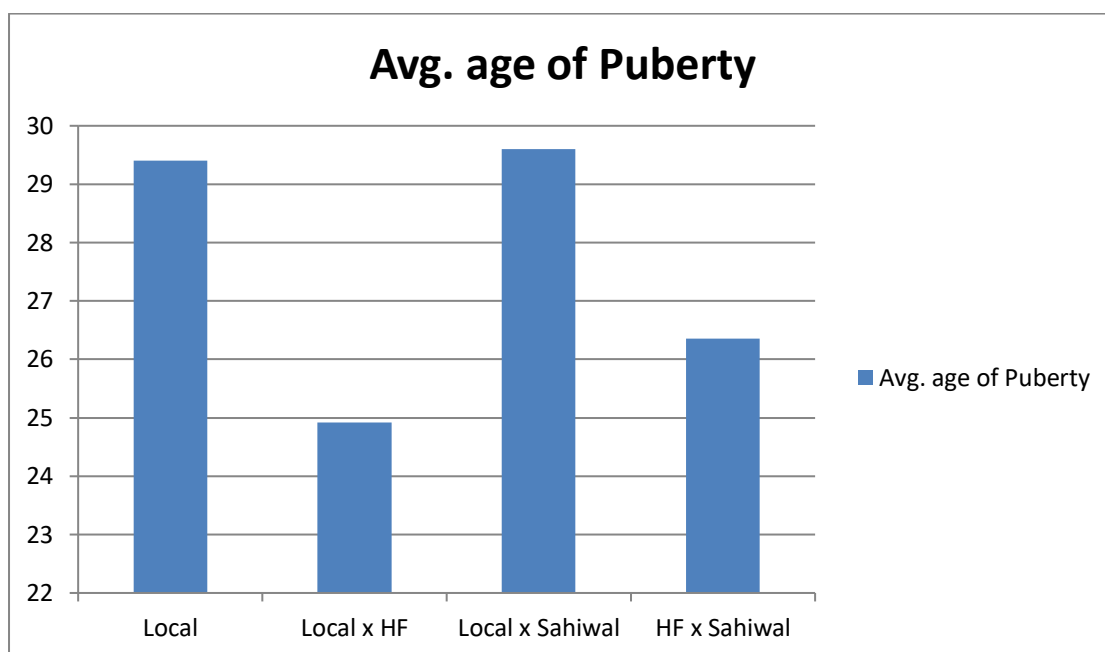
3.2: Reproductive Performance:

3.2.1 Age of puberty:

In this study the maximum puberty age found in Local x Sahiwal cross breed (29.6 ± 1.099 days) and the minimum age of puberty found in Local x Holstein Friesian (24.92 ± 1.186 days). So, the Local x Holstein Friesian cross breed is better than the other breeds.

Table 3: Age of puberty of different dairy breeds under farm condition

Breeds	No. of Animal	Mean Age of Puberty (months)	Standard Error (S.E)	Maximum Age of Puberty (months)	Minimum Age of Puberty (months)
Local non descriptive	25	29.4	1.150	40	23
Local x Holstein Friesian	25	24.92	1.186	35	17
Local x Sahiwal	25	29.6	1.099	38	20
Holstein Friesian x Sahiwal	25	26.36	0.993	35	16



Graph 3: Average age of puberty of different dairy breeds under farm condition

Local x Holstein Friesian cows showed the lowest puberty age 25 months, which were followed Holstein Friesian x Sahiwal, Local, Local x Sahiwal cows respectively. Some researchers reported higher values ranging from 32.5 to 42.45 months for non-descript Deshi/Indigenous cows (Majid *et al.* 1995 and Ali *et al.* 2006), 39.23 ± 4.31 and 35.1 ± 9.24 months for $S \times$ Pabna crosses cows (Hoque *et al.* 1999). But in case of $F \times$ Pabna crosses the value was 25.53 ± 5.59 months (Hoque *et al.* 1999) which is shorter than the present study. The age of puberty was 35.6 ± 0.53 months for local cattle in India which is also higher than our finding. The variation between local and other breeds due to differences in nutrition body condition score (BCS), management, environment and different genotypes, feeding, watering, ventilation and temperature.

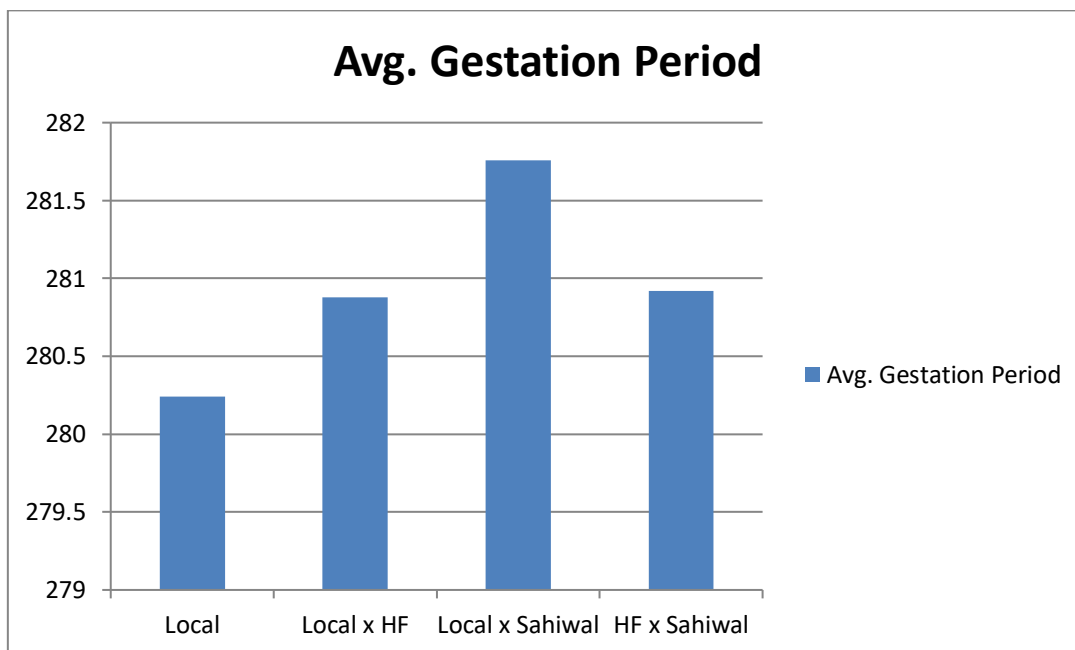
3.2.2 Gestation period:

In this study the highest average gestation period found in Local x Sahiwal cross breed (281.76 ± 0.838 days) and the lowest average gestation period found in local non descriptive breed (280.24 ± 0.887 days). No mentionable variation were found in these study for gestation period of different cross breeds.

Table 4: Gestation period of different dairy breeds under farm condition

Breeds	No. of Animal	Mean Gestation period (days)	Standard Error (S.E)	Maximum Gestation period (days)	Minimum Gestation period (days)
Local non descriptive	25	280.24	0.887	287	271
Local x Holstein Friesian	25	280.88	1.048	289	270
Local x Sahiwal	25	281.76	0.838	289	272
Holstein Friesian x Sahiwal	25	280.92	0.785	287	273

The normal gestation period of cows is 280 ± 10 days. The gestation period was reported 285 days for Sahiwal, 282 days for Sahiwal x local and 287 days for Red Sindhi x local cows (Ghose *et al.*, 1995)



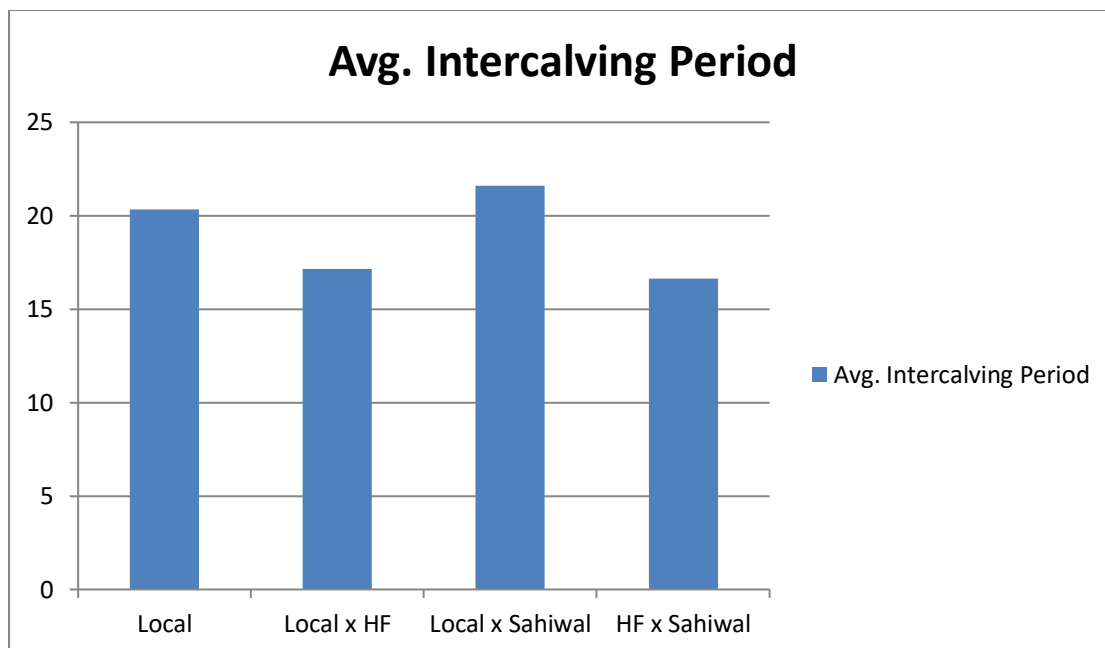
Graph 4: Average gestation period of different dairy breeds under farm condition

3.2.3 Intercalving period:

The minimum intercalving period found in this study on Holstein Friesian x Sahiwal cross breed (16.64 ± 0.443 months) and the maximum intercalving period found in Local x Sahiwal cross breed (21.6 ± 0.516 months).

Table 5: Intercalving period of different dairy breeds under farm condition

Breeds	No. of Animal	Mean Inter calving period (months)	Standard Error (S.E)	Maximum Inter calving period (months)	Minimum Inter calving period (months)
Local non descriptive	25	20.32	0.562	25	15
Local x Holstein Friesian	25	17.16	0.544	22	13
Local x Sahiwal	25	21.6	0.516	25	17
Holstein Friesian x Sahiwal	25	16.64	0.443	22	13



Graph 5: Average Intercalving period of different dairy breeds under farm condition

S.C Mondal (1998) in his study named "A comparative study on the productive performance of different dairy breeds on BAU dairy Farm" reported that the calving interval of Jersey cross, Sahiwal cross, Friesian cross were 501.4 ± 86.41 , 444.9 ± 94.93 , 431 ± 98.53 days respectively.

LIMITATIONS

In this study only the productive and reproductive performance of breed combination of HF and local crosses which were available in farm condition was discussed briefly. Due to lack of proper information in aspect of managements and lack of proper record, the different parameters of productive and reproductive performance could not be discussed properly. A short term study period may cause error in some results as well as couldn't find out the other productive and reproductive parameters.

CONCLUSION

In this study an attempt was made to evaluate the actual figure of productive and reproductive performance of Local non descriptive and some other cross breeds in farm condition at Chittagong metropolitan area. From the above discussion we have found that average milk production, Lactation length, age of puberty, gestation period and intercalving period were 15.184 ± 0.418 liters, 324.76 ± 2.645 days, 26.36 ± 0.993 months, 280.92 ± 0.785 days and 16.64 ± 0.443 months for Sahiwal X Friesian respectively. The overall productive and reproductive performance of Sahiwal X Friesian is better than any other cross breeds of this study Chittagong metropolitan area. This cross breed should be reared in commercial dairy farming for more benefit of the farmer. So, on the basis of production and reproduction performance and the climatic condition of Bangladesh, Holstein Friesian x Sahiwal is superior than other cross bred and it can be recommended for milk production in our developing countries.

REFERENCES

- Alam M., Bhuiyan, A. K. F. H., Ali, A. and A. Mamun. 2007. Genetic analysis of birth weight and milk production of Red Chittagong cattle of Bangladesh. *Bang. J. Anim. Sci.*, 36(1&2): 24-32.
- Ali, M. H., Islam, M. N., Khan, M. A. S., and Islam, M. N. 2006. Reproductive performance of different crossbred and indigenous dairy cows at Takerhat milk shed area, under the Bangladesh Milk Producers' co-operative union limited (milk vita)
- Asaduzzaman M 2000 Livestock sector, economic development and poverty alleviation in Bangladesh. In: M A S Mandal (editor), Changing rural economy of Bangladesh (Bangladesh Economic Association, Dhaka), 42-53.
- Bangladesh Bureau of Statistics (BBS) (2003). Statistical Year Book of Bangladesh, 2002-2003, Ministry of planning, Dhaka.
- Bedi, M.S. 1989. Dairy development, marketing and economic growth, P: 10-17.
- Bhuiyan, A. K. F. H. and Sultana, T. 1994. Analysis of performance of exotic cattle breeds and their crosses in Bangladesh. Proc. of the 5th World Congress on Genetic Applied to Livestock Production, Held on 7-12 August 1994 in Guelph, Canada.20 : 355-358.
- Dalal, J.H., Arora, K.C. & Rath S.S. 1991. Evaluation of performance traits in half bred cattle. Indian J. Dairy Sci. XLIV (07).
- Directorate of Livestock Services, 1993 MOFL, Dhaka
- DLS (Department of Livestock Services). 2015-16. *An overview*, DLS, Dhaka, Bangladesh.

- DLS 2008 Annual report on livestock, Division of Livestock Statistics, Ministry of Fisheries and Livestock, Farmgate, Dhaka, Bangladesh Economic and Political Weekly, Vol. 14 (12-13): A9-A24.
- Ghosh, D.K 1995 Economic traits of Crossbred cattle in small dairy enterprise of Gazipur District. M.Sc. Thesis; Department of Physiology, BAU, Mymensingh, Bangladesh.
- GOB, 2004. Bangladesh Economic Review, Financial Advisory Subdivision, Finance Division, Ministry of Finance, Government of People Republic of Bangladesh, Dhaka.
- Haque S A M 2009 Bangladesh: Social gains from dairy development. In: Animal Production and Health Commission for Asia and the Pacific and Food and Agriculture Organization (APHCA-FAO) publication on smallholder dairy development: Lessons learned in Asia, RAP publication 2009/2.
- Hemme T 2008 IFCN Dairy Report. International Farm Comparison Network. IFCN Dairy Research Center. Kiel Germany
- Islam, M.N (1999). A study on the Socio-economic status and some productive and reproductive performances of crossbred and indigenous dairy cows under small holder dairy farming condition in Foridpur Municipal Area. M.S thesis, Dept. of Dairy Science, BAU, Mymensingh.
- Kabir, F. and M.R. Islam 2009. Comparative study on productive and reproductive performance of local and different crossbred dairy cows at daulatpur khulna in Bangladesh. *Bang. J. Res. Pub.* 3(2):909-914.
- Karim Z 1997 Agriculture for 21st century in Bangladesh. In: A final draft policy report on National Livestock Development Policy, Ministry of Fisheries and Livestock, Dhaka, Bangladesh.
- Majid, M. A., Nahar, T. N., Talukdar, A. I. and M. A. Rahman. 1995. Factors affecting the reproductive efficiency of crossbred cows. *Bang. J. Live. Res.*, 2(1): 18-22.

Majid, M.A., Nahar, T.N., Talukdar, A.I and Rahman, M.A. 1992 . *Bangladesh J.Livest.*

Miyan H A 1996 Towards sustainable development: The national conservation strategy of Bangladesh. Consultancy report on the livestock sector. Ministry of Environment and Forestry, Dhaka, Bangladesh.

Nahar, T.N., Islam, N. and Hasnath, M.A. 1992. *Asian-Aus. J. Anim. Sci.* 5: 435.

Saadullah, M 2001 Smallholder dairy production and marketing in Bangladesh. In: Smallholder dairy production and marketing-opportunities and constraints; Proceedings of a South-South workshop held at National Dairy Development Board (NDDB) Anand, India, 13-16 March 2001.

Shamsuddin M, Alam M M, Hossein M S, Goodger W J, Bari F Y, Ahmed T U, Hossain M M and Khan A. H. M. S. I. 2007 Participatory rural appraisal to identify needs and prospects of market-oriented dairy industries in Bangladesh. *Tropical Animal Health and Production* 39:567-581.

ACKNOWLEDGEMENTS

The author wishes to acknowledge the immeasurable grace and profound kindness of Almighty “GOD” the supreme authority and supreme ruler of universe, who empowers the author to complete the work successfully.

The author doesn't have adequate words to express deepest sense of gratitude, respect and immense indebtedness to honorable teacher and internship supervisor, **Dr. Omar Faruk Miazi**, Associate Professor, Dept. of Genetics and Animal Breeding, Chittagong Veterinary and Animal Sciences University for his scholastic guidance, sympathetic supervision, valuable advice, continuous inspiration, radical investigation and constructive criticism in all phases of study.

The author would like to express her heartfelt gratitude and respect to the honorable teacher **Prof. Md. Abdul Halim**, Dean, Faculty of Veterinary Medicine and **Dr. A. K. M. Saifuddin**, Director of External Affairs, Chittagong Veterinary and Animal Sciences University for continuing this internship programme.

Finally the author extended his appreciation to his parents, all farm owners and all well-wishers.

The Author

A Questionnaire on Productive and Reproductive Performance
of Different Dairy Cows Under Farm Condition at Chittagong
Metropolitan Area

A. Farm information:

Date:

Name of Farm:

Owner of Farm:

Address:

No. of Animals: _____Cow, _____Heifer, _____Bulls, _____Calves

No. of cow in production:

Production & reproductive performance for individual lactating cows

B. Information of Individual Cow:

1) ID No. of Cow:

2) Breed: put a tick mark

1) Local non descriptive	2) Local X HF	3)Local X Sahiwal	4) HF X Sahiwal
--------------------------	---------------	-------------------	-----------------

3) Parity number:

4) Daily milk yield:liters.

5) Length of Lactation:days.

6) Age of puberty:.....months.

7) Gestation period:.....days.

8) Intercalving period:.....months.

Signature of Investigator

APPENDIX

Data for (Local non descriptive breed)

Sample No.	Milk production (L/Day)	Lactation Length (Days)	Age of puberty (months)	Gestation period (days)	Inter calving period (months)
01	2.5	190	25	275	17
02	2.3	210	23	277	19
03	2.6	195	23	271	15
04	3.0	220	24	285	16
05	3.2	215	23	287	19
06	3.4	210	30	283	20
07	3.2	190	35	280	22
08	1.5	185	33	280	25
09	1.7	205	25	287	21
10	1.8	225	25	282	18
11	1.9	212	27	283	20
12	2.0	208	29	279	23
13	2.7	198	30	271	24
14	2.8	196	38	275	25
15	2.5	200	37	279	19
16	2.5	210	38	280	20
17	1.5	205	23	281	21
18	1.9	215	27	283	17
19	2.5	195	35	286	19
20	2.5	205	37	275	23
21	2.6	210	40	279	25
22	3.2	220	33	280	18
23	3.1	220	23	283	19
24	3.5	190	25	285	22
25	3.3	200	27	280	21
Total	63.7	5129	735	7006	508
Mean	2.548	205.16	29.4	280.24	20.32
SE	0.120847	2.193688	1.150362	0.887468	0.561902

Data for (Local x H.F)

Sample No.	Milk production (L/Day)	Lactation Length (Days)	Age of puberty (months)	Gestation period (days)	Inter calving period (months)
01	7.5	280	18	273	17
02	7.8	285	19	282	13
03	8.0	305	21	285	15
04	14.5	310	25	287	17
05	14.2	312	27	283	19
06	13.5	318	19	281	20
07	13.0	325	25	280	21
08	12.5	295	30	279	13
09	14.0	298	33	270	20
10	10.0	308	35	273	21
11	11.0	312	17	271	14
12	11.5	290	19	285	15
13	12.0	325	20	287	17
14	9.5	327	35	283	16
15	10.0	314	34	280	19
16	11.5	304	35	289	22
17	7.8	302	20	280	20
18	7.9	326	21	289	18
19	8.5	316	23	283	18
20	8.6	318	27	279	19
21	10.5	300	24	275	14
22	8.7	302	19	285	15
23	8.8	295	27	282	16
24	11.5	280	28	281	13
25	10.5	315	22	280	17
Total	263.3	7662	623	7022	429
Mean	10.532	306.48	24.92	280.88	17.16
SE	0.44439922	2.771954786	1.185917366	1.0477277	0.54369108

Data for (Local x Sahiwal)

Sample No.	Milk production (L/Day)	Lactation Length (Days)	Age of puberty (months)	Gestation period (days)	Inter calving period (months)
01	4.7	240	25	278	20
02	4.9	245	22	275	25
03	4.5	260	26	272	23
04	5.0	265	27	275	21
05	5.6	255	20	282	24
06	5.8	230	34	283	19
07	5.6	235	36	285	20
08	6.0	245	33	279	25
09	7.8	265	38	280	23
10	4.5	268	37	288	22
11	8.0	225	30	289	24
12	7.5	230	31	285	25
13	5.7	240	22	283	17
14	5.9	245	27	275	19
15	6.5	248	28	280	20
16	7.5	252	27	285	23
17	7.8	256	25	279	18
18	7.3	258	37	283	19
19	7.8	248	38	282	24
20	7.2	225	35	285	25
21	7.5	235	32	280	21
22	7.3	238	25	285	20
23	4.5	242	24	283	19
24	6.5	260	34	283	19
25	6.8	255	27	280	25
Total	158.2	6165	740	7034	540
Mean	6.328	246.6	29.6	281.36	21.6
SE	0.241006224	2.526525942	1.098483804	0.838411196	0.516397779

Data for (Sahiwal x H.F)

Sample No.	Milk production (L/Day)	Lactation Length (Days)	Age of puberty (months)	Gestation period (days)	Intercalving period (months)
01	12.5	300	19	279	15
02	14.5	305	20	275	17
03	13.5	330	23	277	18
04	12.5	335	25	285	14
05	17.5	340	27	287	20
06	17.0	340	30	280	15
07	14.5	335	28	281	16
08	18.0	338	35	283	18
09	17.0	325	33	275	15
10	18.0	328	31	277	15
11	16.5	330	16	280	16
12	15.5	335	27	283	17
13	13.5	324	26	273	13
14	12.5	320	29	283	19
15	12.0	318	30	284	19
16	13.5	310	32	285	18
17	14.0	315	23	280	14
18	12.0	314	35	281	22
19	15.5	320	24	287	19
20	15.7	330	25	283	15
21	15.9	332	28	280	16
22	18.0	335	21	275	18
23	18.0	310	20	283	14
24	17.5	300	27	286	18
25	14.5	350	25	281	15
Total	379.6	8119	659	7023	416
Mean	15.184	324.76	26.36	280.92	16.64
SE	0.418237572	2.644667591	0.993109594	0.785111457	0.443019939

BIOGRAPHY

I am Sreekanta Biswas, Son of Mr. Subhash Chandra Biswas and Mrs. Sanchita Rani Biswas. I passed secondary School Certificate examination in 2008 followed by Higher Secondary Certificate examination in 2010. Now I am an intern doctor under the Faculty of Veterinary Medicine in Chittagong veterinary and Animal Sciences University. In future, I want to develop me as a veterinary practitioner by dealing as veterinary surgeon. I have immense interest to work in the field of Small Animal Medicine & Surgery.



Sreekanta Biswas

Intern Doctor

Chittagong Veterinary and Animal Sciences University

E-mail: sreekanta92@yahoo.com