**CHAPTER-1**

 **ABSTRACT**

The study was undertaken to evaluate the productive and reproductive performances of different breed combinations of Holstein Frisian and local and to measure the effect of different breed combination of Holstein Frisian, Shahiwal, local at Mollah Dairy Farm in Chittagong district. The prevalence of different reproductive diseases as mastitis, dystocia, and brucellosis was studied. About 68 cows of 1st parity were taken as study population. Age range was 3-5 years of maximum cows. Different breed combinations as (Local × Holstein Frisian) (L×F), (Local× Holstein Frisian) × (Local× Holstein Frisian) ((L×F) x (L×F)), (Local × Holstein Frisian) × Holstein Frisian ((L×F) × F), (Shahiwal × Local) × Holstein Frisian ((S×L) × F) were taken under consideration. The time duration of this study was 3 months and based mainly on recorded data of the farm. To evaluate the productive and reproductive performance, age of 1st calving, days open, gestation period and milk production were considered. The maximum value of HF and SLF crossbreds in different breed combination were in different parameter as age of 1st calving, days open, gestation period, milk production were 3.5±0.3 years, 264±9.3 days, 278±9.3 days, 13.4±3.7 liters respectively. The all breed combinations of HF, Shahiwal and local crosses cause variation in above parameters except in days open. In case of days open the effect found same or no variation because every cow during study period was not come to the heat. As a result to find out the effects of all breed combination of HF and local crosses in “days open” was not possible. There also found that 50% animal of entire flock was affected with reproductive diseases as mastitis, dystocia, and brucellosis. Pattern of diseases affection was in both simple form and complicated form.

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| Key words: Breed, productive performance and reproductive performance, diseases |

 **CHAPTER-2**

 **Introduction**

Agriculture is the economical base of our country. Livestock is one of the most powerful components in the agricultural economy of Bangladesh. The contribution of livestock sub-sector to the agricultural production and annual growth rate of the livestock sub sector are 12.9% and 7.6% respectively (BBS, 1998). The contribution of livestock subsector in GDP in the year of 1995-96, 2000-2001, 2005-2006 were 3.36, 2.95 and 2.93 respectively (BBS, 2007).In Bangladesh about 24.4 million cattle population. Among them 11.49 million were female. In the female cattle population 3.53 million were milking cows and 2.61 million were dry cows (Suthradhar*et al*,2008). Most of the cattle were indigenous cow.

The most of our indigenous cow are the *Bos indicus*type, without some exception they are all poor producer, though they are provided with balanced feed. But they are remarkably heat tolerant and have ability to live on poor quality feed and show resistance against some diseases in certain level (Das *et al.* 2003). On the contrary, performance of the exotic breeds in tropical region shows retarded growth, high mortality, poor fertility and susceptible to diseases (Vacarro, 1979). According to Taneza and Bhat, (1986**)** the performance of exotic breed of temperate genotype in tropical country like Bangladesh is 30-40% lower. The reasons for low production in dairy cows in Bangladesh could be due to their poor genetic makeup and poor disease control and other management fault (Shamsuddin *et al.* 2001). Low conception rate and prolonged postpartum intervals are major problem and constraints in dairy farming in Bangladesh (Alam and Ghosh, 1994). Similar study was carried out by Islam (1999). In order to overcome these problems there are two ways to improve our native stock’s genotypic potential as selection of the best performing existing genetic resources from the indigenous cattle and out crossing with high yielding cattle breed from temperate region. Although some authority mentioned that the selection from indigenous resources is best way, but it is very slow and lengthy process, which is incapable to meet up urgent need. For this reason the out crossing is preferable (Ansell**,** 1985).

A well run dairy farm totally depends upon the productive and reproductive performance of the animals. The productive performance parameters are total milking annually and the reproductive parameters are considered as, age at the first calving, gestation period, days open, service per conception and calving intervals (Haq *et al*. 1993). The farms starting with lactating cows have better productive performance with good feedback (Hassan, 1995). A farm with 13 to 15 month of calving interval, 24 months of age of puberty 1.33 services per conception and 5 kg milk per day per cow could be economically profitable (Azizunessa, 2002).

**Objectives:**

1. To find out and compare production and reproduction performances of different breed combination in Holstein Frisian and Shahiwal with local crosses.
2. To observe effects of different breed combinations on theses parameters (age of 1st calving, days open, gestation period and milk production).
3. To know the prevalence of reproductive diseases in different breed combinations.

**CHAPTER-3**

**MATERIALS AND METHODS**

**Study area:-**

Study was conducted on Mollah dairy farm in Chittagong District. About 68 cows of Holstein Frisian and Shahiwal with local cross were chosen. All of these individuals were in 1st parity. The numbers of individual in each genetic group were as follows:

|  |  |
| --- | --- |
| Breed combination | Number of animals |
| (L×F)×(L×F) × F | 8 |
| (L×F) × F | 23 |
| (L×F) × (L×F) | 8 |
| (L×F×F) × F | 11 |
| L×F |  8 |
| (S×L) × F | 10 |
| Total | 68 |

 Note: F - Holstein Friesian, L - Local breed, S - Shahiwal

**Data collection:**

Data were collected from record sheet of the farm. Confusion was clarified through discussion with Farm manager and other staffs associated with managements of farm. The following information was collected from each individual cow.

1. Cow ID
2. Breed combination
3. Dam
4. Sire
5. Present age
6. Parity
7. Semen used for AI
8. Date of present calving
9. Date of commence heat after caving
10. Days open
11. Date 1st insemination after calving
12. Pregnancy status
13. Complications before calving
14. Complications during calving
15. Complications after caving
16. Gestation period
17. Milk production

Then calculation of the productive and reproductive parameters of individual cow were recorded as-

* Age at 1st calving
* Days open
* Gestation period
* Milk production

**CHAPTER-4**

**RESULTS AND DISCUSSION**

**Data analysis:**

Collected data were complied and tabulated with the objective of the study by using Microsoft Excel Program 2010.

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| --- | --- | --- | --- |
| **Parameters**  | **Breed combinations** | **No of Animals** | **Mean± SD** |
| **Age at first calving(year)** | (L×F)×(L×F) × F | 11 | 3.2±0.6 |
| (L×F) × F | 7 | 2.7±0.2 |
| (L×F) × (L×F) | 7 | 2.9±0.3 |
| (L×F×F) × F | 7 | 3.5±0.3 |
| L×F | 7 | 2.4±0.2 |
| (S×L) × F | 7 | 3.2±0.3 |
| **Days open (days)** | (L×F)×(L×F) × F | 10 | 243±0.9 |
| (L×F) × F | 7 | 199.7±10.4 |
| (L×F) × (L×F) | 7 | 250.1±8.9 |
| (L×F×F) × F | 3 | 232.6±9.6 |
| L×F | 7 | 264.3±9.3 |
| (S×L) × F | 4 | 241.8±14.4 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Gestation period(days)** | (L×F)×(L×F) × F | 10 | 278±7.3 |
| (L×F) × F | 7 | 269.6±6.6 |
| (L×F) × (L×F) | 7 | 266.4±5.8 |
| (L×F×F) × F | 7 | 268.4±3.9 |
| L×F | 7 | 260.1±4.1 |
| (S×L) × F | 3 | 264.3±9.7 |
| **Milk production(liters)** | (L×F)×(L×F) × F | 8 | 13±3.7 |
| (L×F) × F | 23 | 12.7±3.6 |
| (L×F) × (L×F) | 8 | 9.4±1.5 |
| (L×F×F) × F | 11 | 13.4±1.9 |
| L×F | 8 | 9.5±1.6 |
| (S×L) × F | 10 | 9.9±2.1 |

**Age at first calving:**

Age at first calving in different breed combination, the highest value was found 3.5±0.3 years in (L×F×F) x F crossbred andlowest value was found 2.4±0.2 years inL×F Crossbred **.** According to Islam (1999) the average value was 3.02±0.29 years, Miah (2001) the value was 2.87±0.49 years. A wide range of variation was obtained between lowest and highest value in the study area. It may be due to the genetic and environmental causes.Blood percentage of HF is about 75% under the group of (L×F×F) x F. Higher HF blood in individual shows poor performance in Bangladesh (Vacarro, 1979). But in L x F The blood percentage was 50%. This breed combination showing best performance may be due the above cause. That indicates L x F breed combination was best in case of this parameter.

**Days open:**

Days open is a time period between calving to first heat after calving. It is normally 70-80 days desirable. But here the highest value (264.3±9.3 days**)** is found in (L×F) andlowest value (199.7±10.4 days) was found in(L×F) × F**.** Days open of the study population was not agree with (Das, 2003) observation, 131.37±4.70 days. It may be improper management as the weaning of the calves. According to information of farm authority there was no definite period of weaning of the calves. As a result a prolong days open found in this flock. In all breed combination do not giving result. Because of all the cows in study population was not come in heat during study period. That data from all cow was not obtained.

**Gestation period:**

The normal range of gestation period in cow is 270±10 days. The highest andlowest value in different breed combination was showing in (L×F) × (L×F) × F and(L×F) were 278±8.3 days, 260.1±4.1days respectively. According to Asaduzzaman and Miah, Rahman *et al.* (1998) and Roy (2004) who reported that gestation period of Friesian crosses were 282.7±8.41, 289±8.1 and 281.13 ±3.5 days respectively. But in this study the both highest and lowest gestation period is lower than their observation. It may due to various factors as nutrition, diseases, age and parity (Kruif, 1978). Lack of proper nutrition the length of gestation period may lower than normal.

According to the history feeding management is not up to mark, so feeding and nutrient may cause variation the gestation length. In (LxF) the prevalence of brucellosis was 33%. The diseases like Brucellosis cause early parturition. So the lowest gestation period in this group may be due to the Brucellosis. All these cows were in 1st parity. For these reasons the gestation period may be reduced.

**Milk production:**

Milk production was an important parameter to evaluate the performance of cows .The highest value (13±3.7 liters) was observed in (L×F) × (L×F) × F andlowest value (9.4±1.5 liters) was observed in(L×F) × (L×F)**.** That indicates that (L×F) × (L×F) × F breed combination was best in case of this parameter. The present result does not agree with result of (Sutradhar *et al.* 2008*).* He mentioned that the average milk production was 2.71±0.61 litter. But the present result is much higher. In (L×F) × (L×F) × F the blood percentage is 75% of HF, That may cause higher milk production though environmental factor.

**Reproductive diseases in different breed combination:**

In this study folk there also found some reproductive diseases. These are

* Mastitis
* Dystocia
* Brucellosis.

Figure1: Pie chart is showing the percentage of disease in whole study population.

Figure-1 shows that 50% of animal is affected with different reproductive disease as Mastitis, Brucellosis and Dystocia. Among these diseases mastitis is highest 21.43%. It was alarming for the farm. These diseases may cause low milk production. The disease Brucellosis found 10.71%. It was indicating the flock may suffer permanent infertility future. These diseases mainly found in during calving and after calving period. Sometime complication of one more diseases was found in some cows as mastitis + dystocia and brucellosis + dystocia.

 Figure 2: Mastitis in different breed combination

Figure-2 shows the prevalence of mastitis in different breed combination highest value found in L×F, which was about70%. The mastitis was prevailed after calving. The Mastitis prevalence in the folk is alarming. It is indicating the sanitation management poor in this farm. It also proves that proper Hygienic milking method is not follows.

 Figure 3: Brucellosis in different breed combination

Figure- 3, showing the prevalence of brucellosis in different breed combination highest value (about 34%) found in (L×F) × (L×F) breed combination. The brucellosis was prevailed after calving. That indicating that that semen that used in semen was not evaluate properly. It may contain the organism of brucellosis.

 Figure 4: Dystocia in different breed combination

Figure -4, showing the prevalence of dystocia in different breed combination highest value found in (L×F). The distocia was prevailed after calving. It may cause rough handling during parturition. In first caviling it is common incidence.

 **CHAPTER –5**

**CONCLUSION**

In this study an attempt was made to find out both the performance production and reproduction of Holstein Friesian and Shahiwal crosses with non descriptive local cows and to find out the effects of different breed combinations at Mollah Dairy Farm, Chittagong.

The important part of this study was to determine the effects of different breed combination on different reproductive and productive parameters as age of 1st calving, service pert conception, days open, gestation period and milk production calves birth weight and live weight.

The maximum value of HF× Local crossbreds of different breed combination were in different parameter as age of 1st calving, days open, gestation period, milk production calves birth weight and live weight were 3.5±0.3 years, 264.3±9.3days, 278±7.3 days, 13±3.7 liters, respectively.

It was found that the all breed combination of HF and local crosses cause variation in above parameters except in days open. In case of “days open” the effect found same or no variation because every cow during study period was not come to the heat.

There also found that 50% animal of entire flock was affected with different reproductive diseases as mastitis, dystocia, and brucellosis. Pattern of diseases affection was in both simple form and complicated form.

 **CHAPTER-6**

**LIMITATION**

In this study only the productive and reproductive performance of breed combination of HF and local crosses which were available in that farm was discussed briefly.

Due to lack of proper information in aspect of management’s 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.

 **CHAPTER-7**

 **REFERENCES**

Alam, M.G.S and Goush, A., 1994. Plasma and milk progesterone concentration in early

 pregnancy diagnosis in jebu cows***.*** Asian Australian Journal of Animal Sciences,

 78:131-136.

 Ansell, P.H. 1985. Cattle breeding in tropic***.*** World Animal Review, 54: 30-38.

Azzizunessa, 2002. Economic opportunity survey the subsistence dairy farm in Mymensingh

 district. Bangladesh Agriculture University, Mymensingh.

Asaduzzaman, Miah, G. 2002.Comparative performance of indigenous dairy cows under

 small holder dairy farming condition***.*** Journal of Agriculture & Rural Development.

 Vol. 3, 122: 143-145.

Das P.K., Ali S.Z., Islam A.B.M.M and Roy B.K., 2003. A comparative study of productive and

 reproductive performance and estimation of heritability of economic traits in different

 genetic group of cattle available at Baghabari Ghat milk pocket area of Bangladesh.

 Online Journal Biological Science 3(8):726-740.

Ghosh, D.K., 1995. Economic traits of cross breed cattle in small dairy enterprise of Gazipur

 district. M.Sc. thesis. Depertment of Physiology. BAU, Mymensingh, Bangladesh.

Hoque M.A., Amin M.R., Hussain M.S.,1999. Dairy potential of Pabna crossbreed with Sahiwal

 and Friesian and with and between breed sire effect, Asian – Aus Journal of Animal

 Sciences. 12: 161-164.

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 Faridpur municipal area. M.S. thesis. Department of Dairy Science, BAU,

 Mymensingh.

Jabber M.A., and Green D.A.G., 1998. The structure and potential of livestock within the

 context of Agriculture development policy in Bangladesh. Department of Agriculture.

 Economic Aberystwyth Adran. Economy Amaethyldol. 37-57.

Mondol S.C., 1998. A comparative study on the productive performance of different dairy breeds

 on BAU dairy farms. M.S. thesis, BAU, Mymensingh.

Roy P.K.,2004. Study on productive and reproductive performance of different dairy cows under

 farm condition. A production report. Chittagong Veterinary and Animal Sciences

 University.

Rahaman M.F., Islam M.S., Hossain M.A., 1993. Reproduction patterns of different breeds of

 cows in Bangladesh. Bangladesh Journal of livestock Research, Vol 1 (1): 19-24.

Sahan T., 1995. An economic analysis of mini dairy farming in the selected urban area of

 Bangladesh. The Bangladesh Veterinarian. V 18. N:2:88.

Shamsuddin M., Bhuiyan M.M.U., Sikder T.K., sugulle A.H., Chanda P.K., Alam M.G.S and

 Gallway D., 2001. Constrains limiting the frequency of artificial insemination of cattle in

 Bangladesh. IAEA TECDOC- 122: 9-27.