A COMPARATIVE STUDY ON THE PRODUCTIVE & REPRODUCTIVE PERFORMANCE OF DAIRY CATTLE AVAILABLE IN CHAR & PLAIN LAND AREAS OF ULIPUR UPAZILA IN BANGLADESH

A THESIS

Submitted by:

Registration No.: 1305090
Session: 2013-2014
Semester: January-June, 2015

MASTER OF SCIENCE (M.S.)
IN
ANIMAL SCIENCE & NUTRITION

Submitted to:

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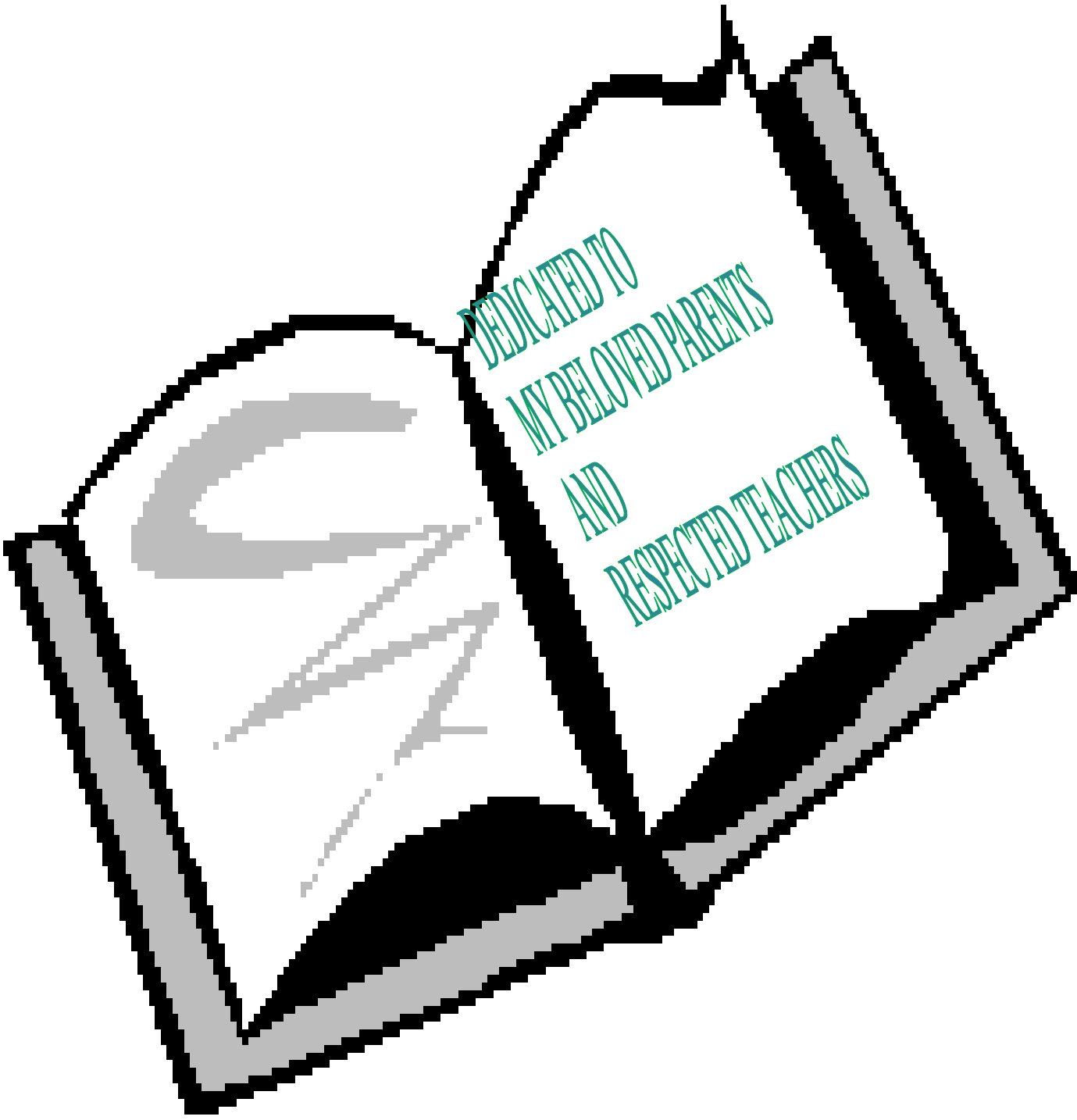
June, 2015

DEDICATION



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The Author

Abstract

This study was undertaken to compare the productive and reproductive performances of crossbreds and Indigenous dairy cows that are available in char & plain land area of Ulipur upazila under Kurigram District. In achieving this objective a sample of 96 dairy cows (Indigenous & Crossbred) were selected randomly covering five villages of Ulipur upazila in Kurigram District under Rangpur division of Bangladesh. A total of 96 dairy cows belong to different breeds, such as 32 Sahiwal cross, 32 Holstein cross, and 32 Indigenous cows were selected and their information regarding milk production and other reproductive parameters were collected from individual farm family for a period of last six months (June-November'2014). The numbers of animals of each of the genotypic classes were 32 for Sahiwal cross, 32 for Holstein cross and 32 for Indigenous. Significant differences were found within the milk yield ($p<0.05$), calving interval ($p<0.05$), service per conception rate, ($p<0.05$), age at first heat, ($p<0.05$), gestation length ($p<0.05$) at plain & char area ($p<0.05$). Average lactation yield, average lactation length and age at first calving (Months) at plain & char area were found in no significant differences ($p>0.05$). Highest milk yield (12.37 lit/day), age at first heat (20.5 months) and lowest calving interval (533 days) were observed in Holstein cross at char land area. But in case of Sahiwal cross, milk yield was (8.4 lit/day), age at first heat (24.5 months) and calving interval was (561days). The lowest milk yield (1.84 lit/day), age at first heat (30.5 months) and highest calving interval (684 days) were found in Indigenous cow. Production performances of Holstein crossbred were superior to other dairy crossbreds. Sahiwal crossbred was ranked in second.

Finally the study identified some problems of raising cows in the rural areas of Bangladesh. These were scarcity of feeds and fodder, inadequate grazing land, lack of

Veterinary Care and services, lack of availability of good quality bull, distance of AI centers specially at char areas, lower conception rate, high price of feed and fodder, lack of training and Extension and low price of milk.

Keywords: Crossbreds, Indigenous, Dairy cows, Productive and Reproductive performance, plain & char area.

Abbreviation and Acronyms

AI: Artificial Insemination

BBS: Bangladesh Bureau of Statistics

BQ: Black Quarter

HYV: High Yielding Variety

GoB: Government of Bangladesh

ml: Milliliter

CR: Conception Rate

SPCR: Service Per Conception Rate

RPM: Rectal Palpation Method

DLS: Department of Livestock Services

DM: Dry Matter

etc.: Etcetera (and others and so forth)

et al: Et alia (L) and others

FAO: Food and Agriculture Organization

FMD: Foot and Mouth Disease

GDP: Gross Domestic Product

HS: Hemorrhagic Septicemia

MMT: Million Metric Ton

Kg: Kilogram

$L \times G^2$: Length of body × Heart Girth square

MN: Million Number

GM: Gram

LSP: Livestock Service Provider

MJSKS: Mohideb Jubo Samaj Kallayan Somity

mg: Milligram

No: Number

THI: Temperature-Humidity Index

Zibika: Zibon Bikash Kendra.

L: Local

HF: Holstein Friesian

SPSS**:** Statistical Package for the Social Sciences

PFP: Pathways from Poverty

Shiree: Stimulating Household Improvement Result in Economic Empowerment

SHOUHARDO**:** Strengthing Households Ability to Respond Development Opportunity

CLP: Chars Livelihoods Program

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CHAPTER I

CHAPTER I

INTRODUCTION

Bangladesh is a densely populated and agro-based developing country where most of the rural people are dependent for their livelihood mainly on cropping and livestock farming.

Nearly 85 per cent of its population is engaged in agriculture and livestock constitutes an important segment of the agriculture sector. Livestock is the most important agricultural component which alone contributes about 1.73% GDP to agriculture (DLS, 2014). Livestock sub-sector is playing a crucial role in the traditional subsistence farming, contributing about 6.5% of the GDP, 13% of the total foreign exchange earnings and providing employment to 20% of the population (BBS, 2008). The total cattle population of Bangladesh is 25.7 million of which 3.53 million is dairy cows yielding 6.96 million metric ton milk per year which is only 20 % of the total requirement. It indicates the importance of the requirement for increasing the milk production in Bangladesh. Dairy cattle population in Bangladesh ranks 12^{th} in the world and 3^{rd} in Asian countries. About 92 per cent of the dairy cattle is non descriptive indigenous and only 8 per cent is reported to be crossbred (BBS, 2010).The average milk yield per cow per day is 1.5 liters for indigenous and 2.5 liters for crossbreds. Dairying is nearly always part of a mixed farming system in Bangladesh (Saadullah, 2009). The majority of the rural households in Bangladesh have 2-3 dairy cows. Sometimes these cattle are used as dual purpose for milk and draft power. Bangladesh is importing powder milk to meet the deficit. The volume of imported milk has increased over the year due to faster domestic demand and costs of importation have exerted pressure on the countries balance of payments and have depressed the local initiative for milk production. Milk is considered as an ideal and a complete food for the people of the whole world. Milk is an important source of animal nutrients and a secondary source of income earnings in rural areas of Bangladesh. In Bangladesh 87 per cent of the total population is under-nourished. Since the supply of protein from fish is not sufficient enough to meet the requirements, the deficit has to be met from animal sources. Livestock has been an important component of the mixed farming system in Bangladesh. The mutual dependence of livestock and crop sector can

hardly be over- emphasized. The crop sector provides feed and fodder such as paddy straw, Rice bran, oil cakes, pulse bran etc. to the livestock sector.

Bangladesh suffers from an acute shortage of livestock products like milk, meat and eggs. The domestic production of milk, meat and eggs accounts for 14.1, 11.9 and 29.3 percent of respective total requirements (Table1). The per capita per day availability of animal protein has declined from 2.03 gm to 1.82 gm over the period 1977 to 1987 (GOB 1990). The DLS of Bangladesh has estimated the country's total milk production at 6.96 million metric tons during 2014-2015. The daily per capita availability and requirement of milk are estimated at 122 ml and 250 ml.

Table 1. Production, Requirements and deficits on livestock Products

Products	Per capita requirements	Per capita availability	Annual Requirements	Annual Production	Annual Deficit
Milk	250 ml/day	122 ml/day	14.56 MMT	6.96 MMT	7.6 MMT
Meat (All)	150 g/day	102 g/day	8.73 MMT	5.86 MMT	2.87 MMT
Eggs	2/ week	1.35 /week	16592 MN	10995 MN	5596 MN

Source: Directorate of Livestock Services, Dhaka (Yearly Success Report 2014-2015)

Note

1. ML= Milliliter
2. GM= Gram

3. MMT= Million Metric Ton
4. MN = Million Number

About two-third of the total population in Bangladesh suffers from malnutrition. The magnitude of malnutrition can be substantially reduced by the consumption of milk or dairy products. Bangladesh has given the priority on the development of dairying at farmer's level to increase the supply of milk from small-holder dairy farms. Most of the cattle population in Bangladesh is non descriptive types, which do not belong to any specific breed and termed as indigenous cattle.

They are smaller in size and their milk production capacity is much lower than that of exotic breeds. The average milk production of local cow is very low and it varies between 300 to 400 liters per lactation period of 180 to 240 days. Generally crossbred cows yield from 600 to 800 liters per lactation of 210 to 240 days (Islam, 1992). The most economic traits of the milk-producing animals are average body weight, milk yield, calving interval, conception rate, gestation length etc. Nowadays the demand for crossbred cows is very high because of higher production of milk (ranging between 10-15 Lts. /day). It is interesting to note that a reasonable number of landless and marginal farmers have found crossbred cows as a profitable enterprise. A large number of crossbreds and indigenous dairy cows are raised in the study areas and there is no study has done as far as we are aware. Moreover, the area is well communicated and the farmers are responsive make the research suitable in the study area. The present study was therefore undertaken to investigate the productive and reproductive performances of dairy cows in Kurigram district and recommend farmers that are suitable in existing ecological and socio-economical condition. The present comparative study was undertaken with the following objectives in mind.

i) To know the productive and reproductive performance of dairy cattle available in char and plain land areas of Ulipur Upazila in Bangladesh.

ii) To know the proper rearing and management practices of dairy cattle at farm level.

iii) To know the profitable dairy farm practices at house hold level

iv) To improve the Socio-Economic condition of poor rural people of Ulipur Upazila in Bangladesh

CHAPTER II

REVIEW OF LITERATURE

CHAPTER II

REVIEW OF LITERATURE

Many research works have been done in different countries of the world on productive and reproductive performances of different type of dairy heifers and cows. But in Bangladesh there is a limited number of research works have been carried out to monitor exiting productive and reproductive performance of crossbred cows under village management condition. Some of related findings of research carried out in Bangladesh or elsewhere are reviewed in this section. To make it easy and clear the reviews are divided into several sections viz.

Reproductive parameters of cow

i) Age at first heat

ii) Conception rate & service per conception

iii) Gestation length

iv) Age at first calving

v) Post-partum heat period

vi) Calving interval

Productive parameters of Cows

i) Daily milk yield

ii) Lactation length

iii) Dry period &

iv) Problems related to dairy cow rearing.

2.1 Age at first heat

Age at first heat is a gradual quantitative phenomenon rather than an acute and qualitative endocrinological event. It occurs when the gonads begin to secrete sufficient steroids to accelerate the growth of the genital organs and the development of secondary sexual characteristics. Alam *et al.*2008 recorded the ages at first heat of Local, L×HF and L×Sh crossbred heifers were 25.20–27.4, 21.40–23.90 and 24.40– 26.20 months, respectively. Sarder *et al.* 2006 studied on comparative reproductive performance of crossbred dairy cows at Ulipur Upazila under Kurigram district. They observed average values of age at first heat in L×HF×SH and L×S×SH Crossbred heifers were 26.60 and 31.50 months, respectively. Khan and Khatun (1998) showed the ages at first heat of Sahiwal× Pabna and Holstein-Friesian× Pabna crossbred heifers were 37.29 and 33.57 months, respectively.

2.2 Conception rate & service per conception

Expressing relative fertility by service per conception was formerly common practices for herds in which the outcome could readily be observed (Salisbury and Vendemark, 1961), service per conception depends largely on the breeding system. It is higher under uncontrolled natural mating and lower under controlled mating or artificial insemination.

(Halim 2010) found that the average conception rates of local and crossbred cows were 77.65% and 74.47 % and service per conception was 1.31 and 1.39, respectively. Sarder *et al.* 2010 observed that the service per conception of indigenous cow was 1.40 and L×HF crossbred cow was 1.80. [Uddin *et al.*,2009; Rahman and Rahman, 2008; Sarder *et al.,*2007; Alam *et al.,* 2006], they found that the services per conception in L×HF and L×Sh crossbred cows were 1.71 to 1.75 and 1.6 to 1.65, respectively. Kabir and Islam (2009) reported the services per conception in L×HF and L×Sh crossbred cows were 1.60 and 2.0, respectively. Rokonuzzaman *et al.* (2009) observed that the service per conception in L×HF and L×Sh crossbred cows was 1.84 and 1.32, respectively. Bhuiyan

and Sultana (2007) found that the highest value (2.05) was observed in HF× SH and lowest value (1.12) was observed in Sahiwal. Ghosh (2005) stated that the numbers of service per conception were in L×HF and L×Sh crossbred cows were1.56 and 1.69 respectively. Mondal *et al.* (2005) also found that the average service per conception was 1.63, 1.60 and 1.67 for Sahiwal crossbred, Sindhi crossbred and Red Chittagong cows, respectively.

2.3 Gestation Length

Gestation length was calculated as interval from conceived to parturition. The duration of gestation length was expressed in terms of days. Majid *et al.* (1995) observed that the gestation length of different genotypes ranged from 270 to 280 days. Mondal *et al*. (2005) found that the average gestation length of Sahiwal crossbred were 276 days, Holstein crossbred was 275 days. Rahman and Rahman (2006) observed the gestation length of different genotypes ranged from 270 to 284 days. Sarder *et al.*(2007) found that gestation length of Local, L×HF and L×Sh crossbred cows were 280, 278 and 279 days, respectively. [Alam *et al., (* 2008) ; Kabir and Islam (2009); Rokonuzzaman *et al.*, (2009)] they found the gestation length of L×HF and L×Sh crossbred cows were 276 to 283 and 277 to 282 days, respectively.

2.4 Age at first calving

First calving marks the beginning productive life of a cow. Age at first calving is closely related to generation interval and influences response to selection. Under controlled breeding system, heifers are usually mated when they are mature enough to withstand the stress of parturition and lactation. This increases the livelihood of early conception after parturition. In traditional breeding systems, however, breeding is often uncontrolled and heifers are bred at the first opportunity. Khan *et al.* (1999) found that the overall age at

first calving was (average) 1038 days in Desi cattle. [Sarder (2006); Rokonuzzaman *et al.* (2009); Kabir and Islam (2009)] they were reported that the age at first calving of L×HF and L×Sh crossbred were 34 to 36 and 37 to 39 months, respectively.

2.5 Daily milk yield

Milk yield is an important for economic return of lactating cows. It is the essential criteria to choose a dairy cow for profitable dairy business. Nahar *et al.* (1992) reported that average milk yield per day of L×HF and L×Sh crossbred cows were 5.50 and 2.90 kg respectively, under rural condition of Bangladesh. They concluded that L×HF crossbred cow performed better in rural condition of Bangladesh. (Sultana *et al.*, 2001; Alam *et al.,* 2008) observed that daily milk production of Local, L×HF and L×Sh crossbred cows were 1.7 to 2.60, 6.3 to7.20 and 4.90 to 5.1 liters, respectively. Mondal *et al.* (2005) found that the average milk yield of Sahiwal crossbred were 2.84 liters, Holstein crossbred was 3.20 litres.The average milk production of L×HF and L×Sh crossbred cows were 12.03 and 5.16 liters respectively, founded by Kabir and Islam (2009) in the comparative study on productive and reproductive performance of local and different crossbred dairy cows. Rokonuzzaman *et al.* (2009) recorded the average daily milk production of L×HF and L×Sh crossbred cows were 8.36 and 4.53 litres, respectively.

2.6 Lactation length

Nahar *et al*. (1992) found the average lactation length of L×HF cows were 330.5 days. Halim (1992) also found that average lactation length for local and crossbred dairy cows were about 228 and 259 days, respectively. (Sultana *et al.*, 2001; Alam *etal.*2008) recorded that the lactation length of local, L×HF and L×Sh crossbred cows were 218 to 221, 254 to 288 and 241 to 254 days, respectively. Khan *et al.* (2001) observed that the lactation length of local and L×HF crossbred cows were 221and 281 days, respectively.

The average lactation length of Sahiwal crossbred were 245 days, Holstein crossbred was 250 days reported by Mondal *et al.* (2005). Rokonuzzaman *et al.* (2009) recorded the average lactation length of L×HF and L×Sh cows were 270 and 250 days, respectively. Kabir and Islam (2009) found comparatively higher the average lactation length of L×HF and L×Sh crossbred cows were 295 and 280 days, respectively.

2.7 Post-partum heat period

Post-partum heat period is defined as the interval between calving and first insemination date. It is the number of days from calving to the first subsequent service of a cow. Dunn (1969) defined post-partum involution as a process of return of the uterus to its normal non pregnant size. Islam (1980) worked with some reproductive traits in 1247 indigenous cows and found post-partum interval to be varied from 2 to 6 months. Han *et al*. (1987) studied the reproductive traits of 4162 Korean native cattle and observed post-partum heat period of 71.59 days. Dawuda *et al*. (1988) studied the interval from calving to first oestrus in 38 Bunazi cows and observed calving to first oestrus to be 158.8 days in the rainy season (June- October) and 122.9 days in the dry season (November-May) respectively. [(Uddin *et al.* (2004); Sarder *et al*. (2007); Alam *et al*. (2008)] they observed that the post-partum heat period of L×HF and L×Sh crossbred cows were 170 to 182 and 167 to 172 days, respectively. Rokonuzzaman *et al.* (2009) found comparatively shorter post-partum heat period in L×HF and L×Sh crossbred cows were 94 and 120 days, respectively.

2.8 Calving interval

Calving interval is defined as the interval between two successive parturition of the same cow. It is the number of days from one calving to the next for the same cow. Calving interval can be divided into three periods (shown in figure): gestation, postpartum

anoestrus (from calving to first oestrus) and the service period (first postpartum first oestrus to conception).The calving interval period should not exceed 80 – 85 days if a calving interval of 12 months is to be achieved (Post TB and Reich MM. 1980). This requires re-establishment of ovarian activity soon after calving and high conception rates. The duration of this period is influenced by nutrition (Wiltbank *et al.,* 1962) season, milk yield; parity (Buck *et al.,* 1976) suckling and uterine involution. Calving interval has been probably the best index of reproductive efficiency in a cattle herd. Resumption of ovarian activity in the postpartum period does not necessarily lead to conception and methods of stimulating oestrus must be considered in relation to their effect on conception (Holness *et al.,*1980) and indirectly, calving intervals. Sultana *et al*. (2001) observed that the calving intervals of Sahiwal × Local cows were 454 days. Uddin *et al.* (2004) found that the calving intervals of local and L×HF crossbred cows were 484 and 489 days, respectively. Alam *et al.* (2008) recorded that the average calving intervals of local, L×HF and L×SH crossbred cows were 495, 487 and 493 days, respectively. Kabir and Islam (2009) founded that the average calving intervals of L×HF and L×Sh crossbred cows were 447.7 and 417.5 days, respectively.

2.9 Dry Period

Hossain and Routledge (1982) reported that the dry period of local cows were very long in comparison to that of crossbred cows. Jersey cows had the shortest dry period of 57 days and local cows had the longest period of 275 days.

3. Problems related to dairy cow rearing

Rahman and Zaman (1992) showed that economics of milk production in the Bathan area of Bangladesh was better from the view point of cost of milk production. The cost of milk production was very much lower than that of any other area of country. The small herd

sizes were found to be the most profitable than the medium herd sizes. A diagnostic survey was conducted to investigate the problems of small farmers regarding livestock production in shahkot area district Sheikhpura in Pakistan. (Jahangir *et al*.1990). A total of 100 respondent from the villages were interviewed and found that average livestock strength was 9, 12 adult animal units per farm. Islam (1992) conducted a study in the two villages of Mymensingh district in Bangladesh and observed that one crucial problem of livestock raising is the higher feed cost particularly in urban and semi- urban milk pocket areas. Furthermore, this study identified that credit and capital shortage with no insurance coverage are the main constraints against dairy development in the study area and some other problems are

- Inadequate health care & Veterinary services problem
- Hybrid bull problem
- Distance of AI center
- Lack of knowledge for rearing cow

CHAPTER III

MATERIALS AND METHODS

CHAPTER III

MATERIALS AND METHODS

Since farmers do not keep records and accounts of their operations of rearing units/ farms, survey has to be conducted. In this study like other survey works information from individual farmer was collected. The following steps were taken in conducting the study.

3.1 Selection of Study area

Ninety six families of five villages namely Mahadeb, Char Ratideb, Mohideb, Rajbollov & Char Sontos-ovirum of two unions in the Ulipur Upazila of Kurigram District were selected for the study. The study was conducted in one Upazila namely Ulipur of Kurigram District in Rangpur Division. The reasons for selecting this area for present study are given below:

i. Dairy cows were available in these areas.
ii. Data collection was easier for the researcher because most of the farmers were under Pathways from Poverty (PFP) - Shiree project, Netzs and UKaid from the CLP funded Project, SHOUHARDO-ii Program, IAPP (Integrated Agricultural Productivity Project) of Government.
iii. The developmental work with improved diet had been started since 2009 under the PFP - Shiree project.
iv. The farmers' co-operation was available under the area so that reliable data could be obtained.
v. The study area was well communicated which would help the researcher in collecting necessary data.

3.2 Preparation of the survey schedule

The survey schedule was developed in accordance with the objectives of the study. It was designed in a simple manner to get accurate information from the dairy owners.

The schedule contained of the following items of information

a) General identification and information of the selected dairy cows' owners that is available in char and plain land areas.

Fig: Sitting with dairy cow rearer who are residing at char area prior to data collection.

(b) Problem faced by the researcher to collect data from the cow owners who are residing at Char area due to unavailability of farmer.

Fig: selection of cross bred cattle like LxHF for data collection at field level.

management

A total of 32 Indigenous cow and 64 cross bred cows (L×HF and L×SH) were selected for the study. Feeding and management were uniform throughout the year. In traditional feeding system animals were grazed in the field from early morning to afternoon and supplied 2–3 kg straw daily as evening meal for each of the animal

Fig: Data collected by Researcher himself on Daily milk yield & lactation

3.4 Period of data collection

Data were collected by the author himself during June 2014 to November 2014. In order to obtain reliable data, he visited the study area once within two months interval and thus three visits were made by him. During the period of data collection, the author stayed at the villages so that the dairy cow owners responded him at their own conveniences.

Fig: Pregnancy check by Researcher himself through RPM

3.5 Methods of Data collection

Collection of reasonable reliable data and other appropriate information from the field is not an easy task. It must be done properly since data are the key of survey and the success of the survey depends on the reliability of the data. In order to make the program

Fig: Pregnancy check by researcher himself throughRPM

successful researcher himself visited every household of selected area during the study period. Direct interview method was used for collecting of information.

The following information was recorded as shown in Appendix-I:

i) Name and address of farmer
ii) Age at first heat of heifer
iii) Genotype of cows
iv) Age of cows
v) Date and

Fig: Live weight measuring of char dwelling cattle for providing de-worming bolus.

vi) Number of service per conception

vii) Pregnancy diagnosis
viii) Gestation length
ix) Age at first calving
x) Milk yield
xi) Lactation length
xii) Post-partum heat period
xiii) Calving interval etc.

Fig: Data collected by Researcher himself on SPCR from owner at local cow

3.6 Statistical analysis

The collected data under this study was analyzed. The raw data were entered and sorted into MS Excel sheet then transferred to the statistical analysis (Statistical Package for the Social Sciences software (SPSS, 16) for descriptive result orientated analysis

Fig: Collecting data on post-partum heat period of cow

(Line graph & bar diagram). All data are expressed as mean ± SEM value. Differences were considered significant at the level of $p<0.05$.

CHAPTER IV

RESULTS AND DISCUSSION

Chapter IV

Results and Discussion

4.1 Introduction:

The purpose of this section of the study is to determine the productive and reproductive performance of dairy cattle that are available in char and plain land areas of Ulipur Upazila in Bangladesh. The productive and reproductive performances of the dairy cows were measured by Lactation period, yield per lactation, gestation period, calving interval, conception rate, service per conception and post-partum heat period.

4.2 Summary Table of Productive & Reproductive Parameters of dairy cows available in char & Plain land area of Ulipur Upazila in Bangladesh

4.2.1) Productive parameters of Dairy cows available in char and plain land areas:

Comparison of Productive performance of Dairy cows available in Char & Plain land areas of Ulipur Upazila (sample size 24 cows among them 8 are Indigenous & 16 are crossbreed cow for each lactation. Total no. of cows are 96 among them 32 are indigenous and 64 are crossbreed like HF and Sahiwal)

Sl #	Parameters	Areas	Plain & char land (Indigenous cow)				Ave. Production (Lts) of Indigenous cow (Plain &Char area)	Plain & char land (Cross bred cow)				Average Production (Lts) of cross bred cow
1	1st Lactation-Milk yield	Plain	1.6	1.1	1.3	1.5	1.37	**Lx SH**	5.2	4.3	5	6	5.12
								Lx HF	6	6.5	7	8	6.87

	per day (Lts)	Char	2.1	2.2	2.5	2.7	2.1	**Lx SH**	6	4.5	6.7	8	6.3
								Lx HF	7.5	7.5	8	9	8
2	2nd Lactation-Milk yield per day (Lts)	Plain	2.2	2	2.5	2.6	2.32	**Lx SH**	7	7.2	7.5	8.6	7.57
								Lx HF	8.2	9	9.5	9.8	9.12
		Char	2.3	3.2	2.6	3	2.77	**Lx SH**	7.4	7.8	8	9	7
								Lx HF	9.2	9.4	9.6	10	9.55
3	3rd lactation-Milk yield per day (Lts)	Plain	2.5	2.3	2.7	2.4	2.47	**Lx SH**	7.25	8.5	8.2	8.7	8.16
								Lx HF	11	12	11.5	12.5	11.75
		Char	2.7	3.1	3	2.9	2.92	**Lx SH**	7.5	8.6	8.5	9	8.4
								Lx HF	12	12.5	12	13	12.37
4	4th lactation-Milk yield per day (Lts)	Plain	1.25	1	1.2	1.3	1.18	**Lx SH**	5	4.1	4.5	5	4.65
								Lx HF	8.1	8.6	9.1	9.3	8.77
		Char	1.5	1.4	1.25	1.4	1.38	**Lx SH**	4	4.1	5.25	6	4.83
								Lx HF	9	9.2	9.5	9.7	9.35
5	Average 1st - 4th Lactation-Milk yield per day (Lts)	Plain					1.840	**LxSH**					6.37
								Lx HF					9.13
		Char					2.296	**LxSH**					6.63
								Lx HF					9.81
6	1st Lactation length (Period/days)	Plain	175	176	174	173	174.5	**Lx SH**	245	246	244	243	244.5
								Lx HF	253	252	251	254	252.5
		Char	192	191	193	190	191.5	**Lx SH**	250	252	255	257	253.5
								Lx HF	255	256	257	260	257
7	2nd Lactation length (Period/days)	Plain	190	185	184	188	186.7	**Lx SH**	255	254	253	252	253.5
								Lx HF	260	262	261	259	260.5
		Char	191	192	195	194	193	**Lx SH**	258	257	255	259	257.25
								Lx HF	265	263	264	266	264.5
	3rd Lactation	Plain	195	196	198	200	197.2	**Lx SH**	270	271	272	272.5	271.37

8	length (Period/days)							**Lx HF**	275	273	274.5	275.5	274.5
		Char	210	205	207	209	207.7	**Lx SH**	265	266	264	263	264.5
								Lx HF	278	277	276	280	277.75
9	4th Lactation length (Period/days)	Plain	180	173	174	177	176	**Lx SH**	210	215	212	213	212.5
								Lx HF	215	218	217	220	217.5
		Char	182	175	176	178	177.7	**Lx SH**	212	213	215	214	213.5
								Lx HF	216	220	222	223	220.25
10	Average (1st-4th) Lactation length (Periods/day)	Plain					183.6	**Lx SH**					245.468
								Lx HF					251.25
		Char					192.5	**Lx SH**					247.187
								Lx HF					254.875

4.2.2) Reproductive performance of Dairy cows available in char and plain land areas:

Sl #	Parameters	Areas	Plain & char land (Deshi cow)				Average (Month/ days)	Plain & char land (Crossbred cow like HF & SW					Ave. mon./ days/ times
1	Age at first heat (months)	Plain	33	32	34	36	33.75	Lx SH	27	26	28	30	27.75
								Lx HF	24	23	26	28	25.25
		Char	31	30	29	32	30.5	Lx SH	25	24	26	23	24.5
								Lx HF	21	19	22	20	20.5
2	Service per conception in 1st Pariety (times)	Plain	1.72	1.92	2.13	2.31	2.02	Lx SH	1.66	1.68	1.87	1.92	1.78
								Lx HF	1.62	1.65	1.87	1.92	1.76
		Char	1.911	1.52	2.05	1.99	1.86	LxSH	1.58	1.61	1.67	1.69	1.63
								Lx HF	1.61	1.63	1.64	1.67	1.63
3	Service per conception in 2nd Pariety (times)	Plain	1.87	1.81	1.78	1.77	1.80	Lx SH	1.68	1.69	1.65	1.66	1.67
								LxHF	1.62	1.63	1.61	1.6	1.61
		Char	1.81	1.78	1.8	1.76	1.78	Lx SH	1.64	1.63	1.62	1.63	1.63
								Lx HF	1.59	1.6	1.61	1.58	1.59
4	Service per conception in 3rd Pariety (times)	Plain	2.1	2.05	2.07	2.11	2.08	Lx SH	1.87	1.82	1.84	1.83	1.84
								Lx HF	1.85	1.81	1.78	1.8	1.81
		Char	2.04	2.03	2.01	2.02	2.02	Lx SH	1.8	1.81	1.86	1.85	1.83
								Lx HF	1.88	1.9	1.92	1.9	1.9
5	Service per conception in 4th	Plain	2.12	2.15	2.1	2.11	2.12	Lx SH	2.11	1.98	2.1	2.09	2.07
								Lx HF	1.87	1.82	1.84	1.83	1.84
		Char	2.06	2.07	2.04	2.02	2.04	Lx SH	2.01	2.05	2.07	2.09	2.05

	Pariety							Lx HF	1.89	1.92	1.93	1.91	1.91
6	Average service per conception rate in 1st-4th Pariety)	Plain					2.0078	Lx SH					1.84
								Lx HF					1.75
		Char					1.93	LxSH					1.78
								Lx HF					1.76
7	Conception rate (%)	plain	71.7	82.8	73.05	81.8	77.33	Lx SH	70	70.5	66.67	77.07	71.06
								Lx HF	75	70.5	66.67	77.07	72.31
		Char	73	83.6	74.5	82.2	78.325	Lx SH	81.5	71.2	67.5	78.08	74.58
								Lx HF	75.5	72.2	67.5	78	73.31
8	Age at first calving (Months)	Plain	45	42	44	45	44	Lx SH	36	34	37.5	37	36.12
								Lx HF	33	35	36.5	34.5	34.75
		Char	43	42	39	41	41.25	Lx SH	33	31	34	32	32.5
								Lx HF	32.5	33.5	35	34	33.75
9	Gestation length (days)	Plain	282	284	286	279	282.75	Lx SH	287	279	284	290	285
								Lx HF	288	285	290	287	287.5
		Char	285	290	283	288	286.5	Lx SH	290	286	283	287	286.5
								Lx HF	288	290	285	287	287.5
10	Post-partum heat period (Months)	Plain	6.5	5.4	4.5	6	5.6	Lx SH	5	4.5	6	5.8	5.325
								Lx HF	4	4.2	5	5.3	4.625
		Char	4.2	5.5	4.7	5	4.85	Lx SH	4.7	4.3	5	5.3	4.825
								Lx HF	4.2	4.1	4.5	4.6	4.35
11	Calving interval (Months) at 1st lactation	Plain	22	21	21.5	23	21.87	Lx SH	18	18.5	19	17.5	18.25
								Lx HF	16.5	16	17	17.5	16.75
		Char	20	20.5	21	22	20.87	Lx SH	17.3	17.5	18	17.8	17.65
								Lx HF	16	15.8	16.2	16.4	16.1
12	Calving interval (Months) at 2nd lactation	Plain	21	21.5	22	21.2	21.42	Lx SH	17	17.5	18	17.4	17.47
								Lx HF	16	15.5	16.5	16.8	16.2
		Char	20.5	19.5	19.7	20	19.92	LxSH	16.7	17	17.3	16.8	16.95
								Lx HF	15.8	15	16	16.3	15.775

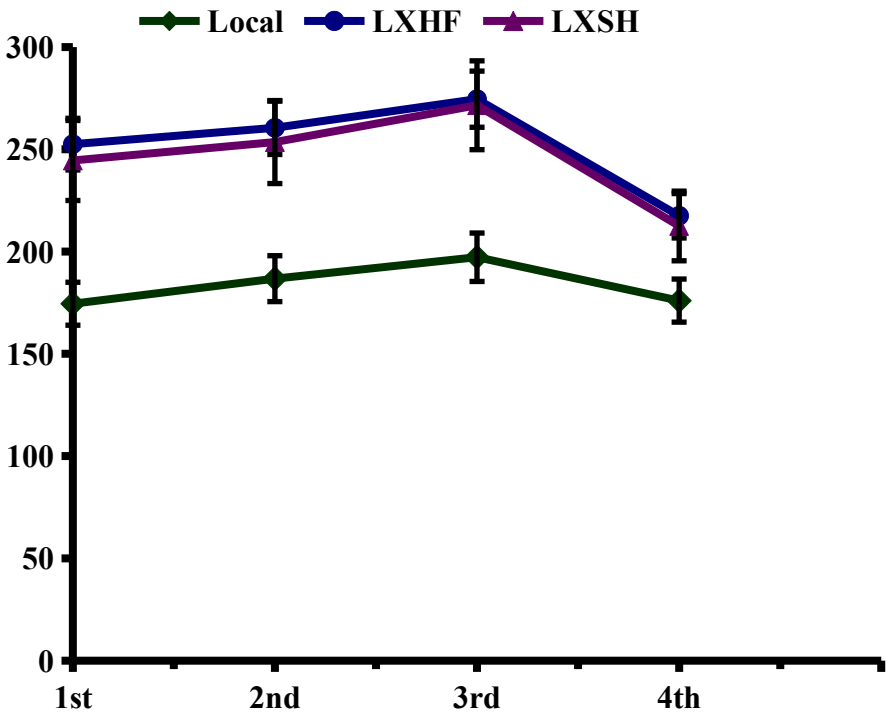
13	Calving interval (Months) at 3rd lactation	Plain	22	22.5	23	23.5	22.75	Lx SH	18	18.4	18.5	18.9	18.45
								Lx HF	17.5	17.7	17.8	17.4	17.6
		Char	21.8	20.5	19.5	20.5	20.57	Lx SH	17.7	17.9	17.3	17.2	17.52
								Lx HF	17.4	17.3	17.6	18	17.57
14	Calving interval (Months) at 4th lactation	Plain	24	23	22	22.5	22.87	Lx SH	20	21	20.5	21.5	20.75
								Lx HF	19	19.6	19.5	18.5	19.15
		Char	23	21.5	22.5	21	22	Lx SH	19.7	21	21.4	20.8	20.72
								Lx HF	19	19.2	19.7	20	19.47
15	Average Calving interval (Months) at (1st-4th) lactation	Plain					22.23	Lx SH					18.73
								Lx HF					17.42
		Char					20.84	Lx SH					18.21
								Lx HF					17.23

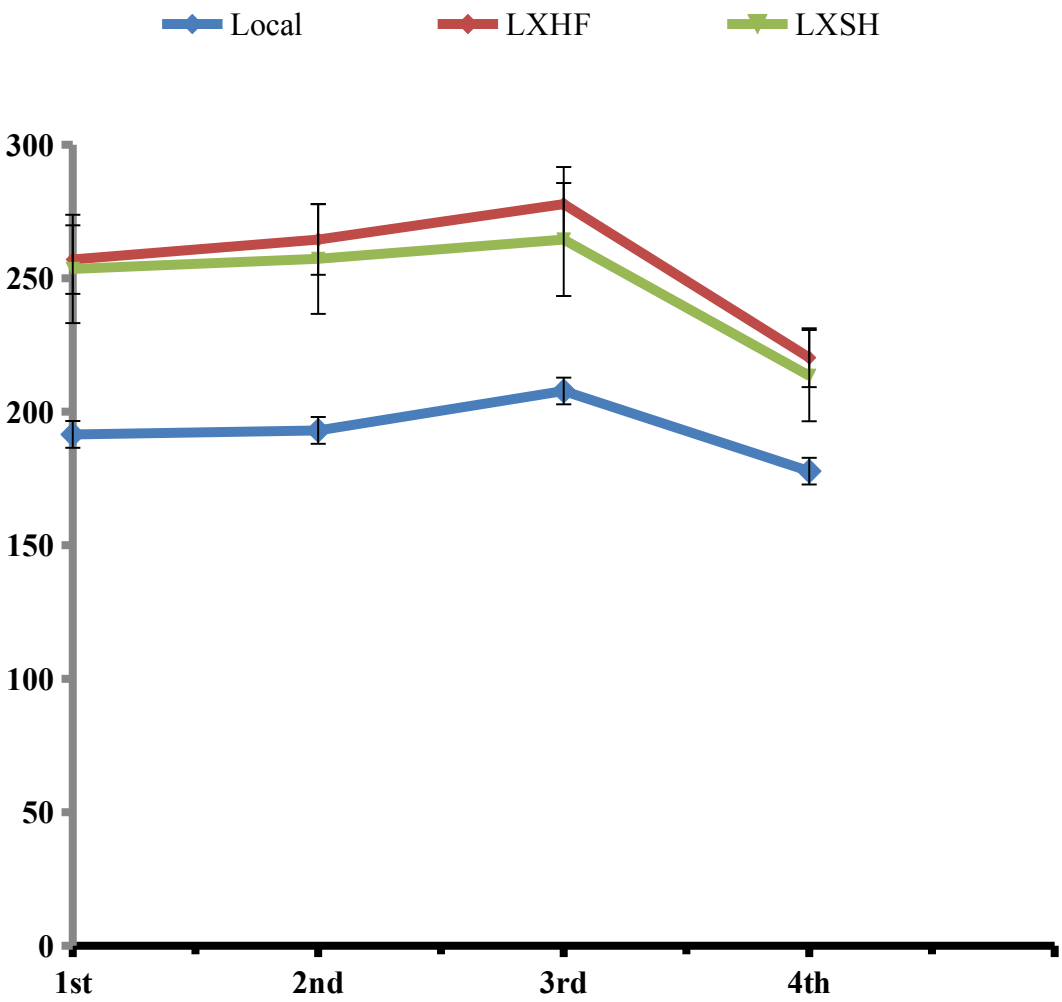
4.3 Lactation period

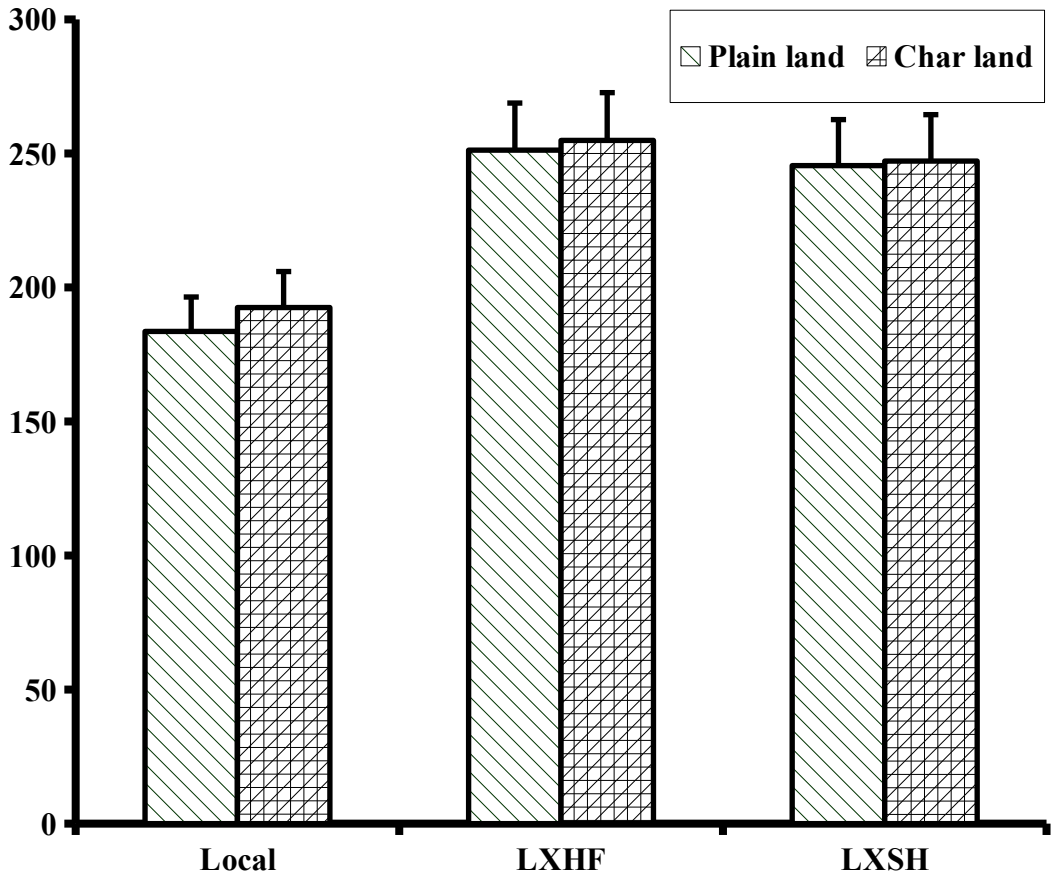
In this study, the lactation period was conducted at different inter calving intervals. Lactation length for indigenous and cross bred cows at plain land were 185 days and 262.5 days respectively, but in context of char area, Lactation length for indigenous and crossbred cows were 199.25 days and 276 days respectively. The maximum length of lactation for indigenous and crossbred cows at plain land was 195 days and 270 days at 3rd lactation whereas minimum lactation length was 175 and 250 days at 1st lactation respectively. The maximum length of lactation for indigenous and crossbred cows specially LxHF at char land were 207 days and 277 days respectively at 3rd lactation whereas minimum lactation length were 191and 257 days at 1st lactation respectively in

that specific breed. Rokonuzzaman *et al.* (2009) recorded the average lactation length of L×HF and L×Sh cows were 270 and 250 days, respectively. Kabir and Islam (2009) found comparatively higher the average lactation length of L×HF and L×Sh crossbred cows were 295 and 280 days, respectively.

Our study signifies that the length of Lactation period at different calving were not significantly different, but the length of Lactation period between indigenous and cross bred cows at plain and char land were significantly different (Figure1.2& 3,)



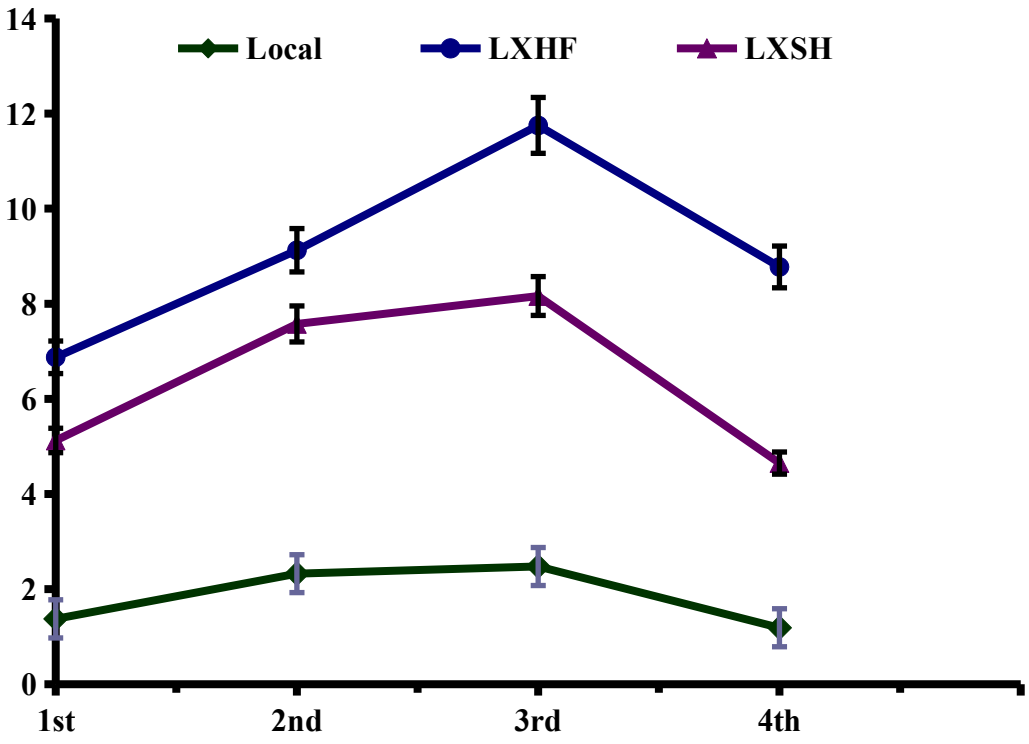

Local
LXHF
LXSH
300
250
200
150
100
50
0
1st
2nd
3rd
4th

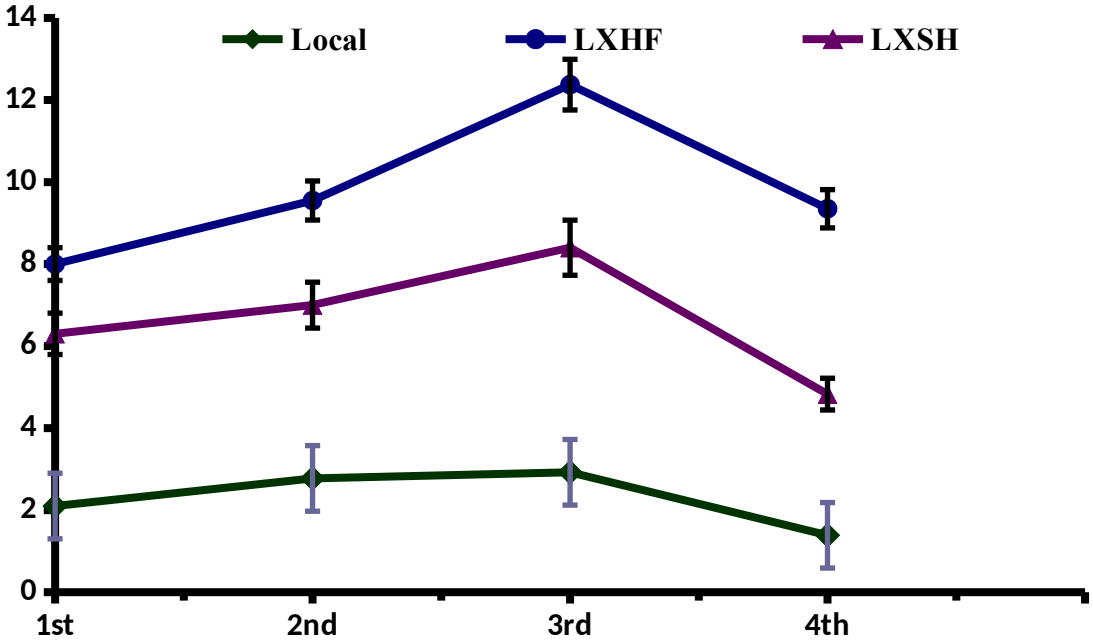


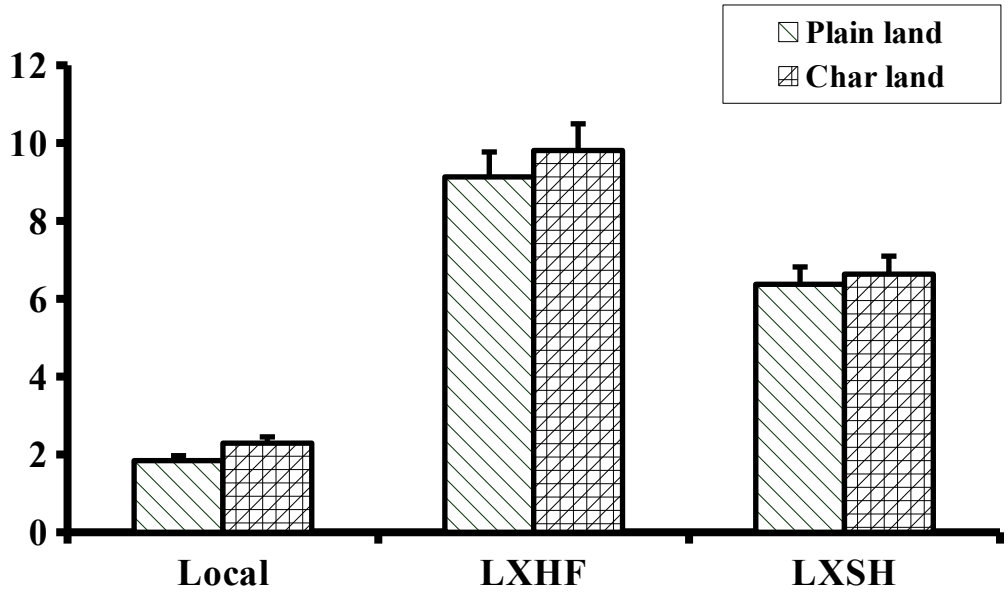
4.4 Yield per lactation

Yield per lactation is measured by taking average milk production per day multiply by average lactation period in days. It was found from my study that, the average milk production per day for indigenous and crossbred cow specially LxHF & LxSH at plain land were 1.84 liters and 9.13 & 6.37 liters respectively but in context of char area, the average milk production per day for indigenous and crossbred cow like LxHF & LxSH were 2.29 liters, 9.81 & 6.63 liters respectively. While their respective average yields per lactation for indigenous and crossbred cows like LxHF & LxSH at plain lands were 336.

liters, 2291.63 liters & 1560.65 liters but in case of char area the average production were 439.68 liters, 2491.74 & 1637.61 liters respectively. The average milk production of L×HF and L×SH crossbred cows were 12.03 and 5.16 liters respectively, founded by Kabir and Islam (2009) in the comparative study on productive and reproductive performance of local and different crossbred dairy cows. Rokonuzzaman *et al.* (2009) recorded the average daily milk production of L×HF and L×SH cross bred cows were 8.36 and 4.53 liters, respectively.



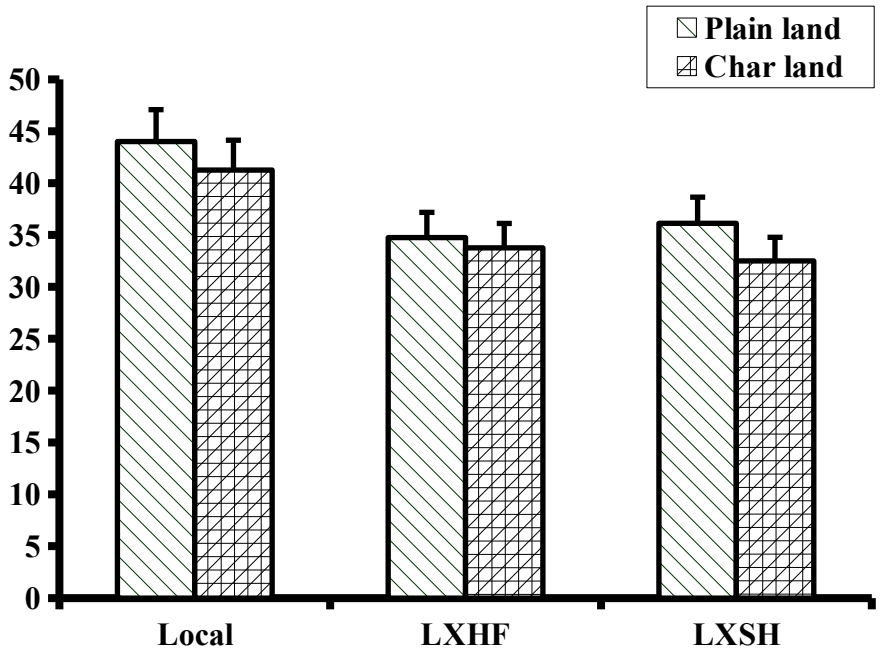

Local
LXHF
LXSH
14
12
10
8
6
4
2
0
1st
2nd
3rd
4th



4.5 Age at first calving

The field data shows that the average age at first calving at indigenous and crossbred cattle like L×HF & L×SH at plain lands are 44 months, 34.75 & 36.12 months respectively whereas the average age at first calving at indigenous and crossbred cattle like L×HF & L×SH at char lands are 41.25 months, 32.5 and 33.75 months respectively. The present results were agreed with the results of Rokonuzzaman *et al.* (2009). They recorded age at first calving of L×HF and L×SH crossbred cows were 34.12 and 36.64 months, respectively. Kabir and Islam, (2009) shown that the age at first calving in L×HF and L×Sh crossbred cows were 35 and 38 months, respectively. Sarder (2006) reported the age at first calving of L×HF and L×SH crossbred were 35.80 and 39.10 months, respectively. On the other hands our result showed the age at first calving (months) within the same

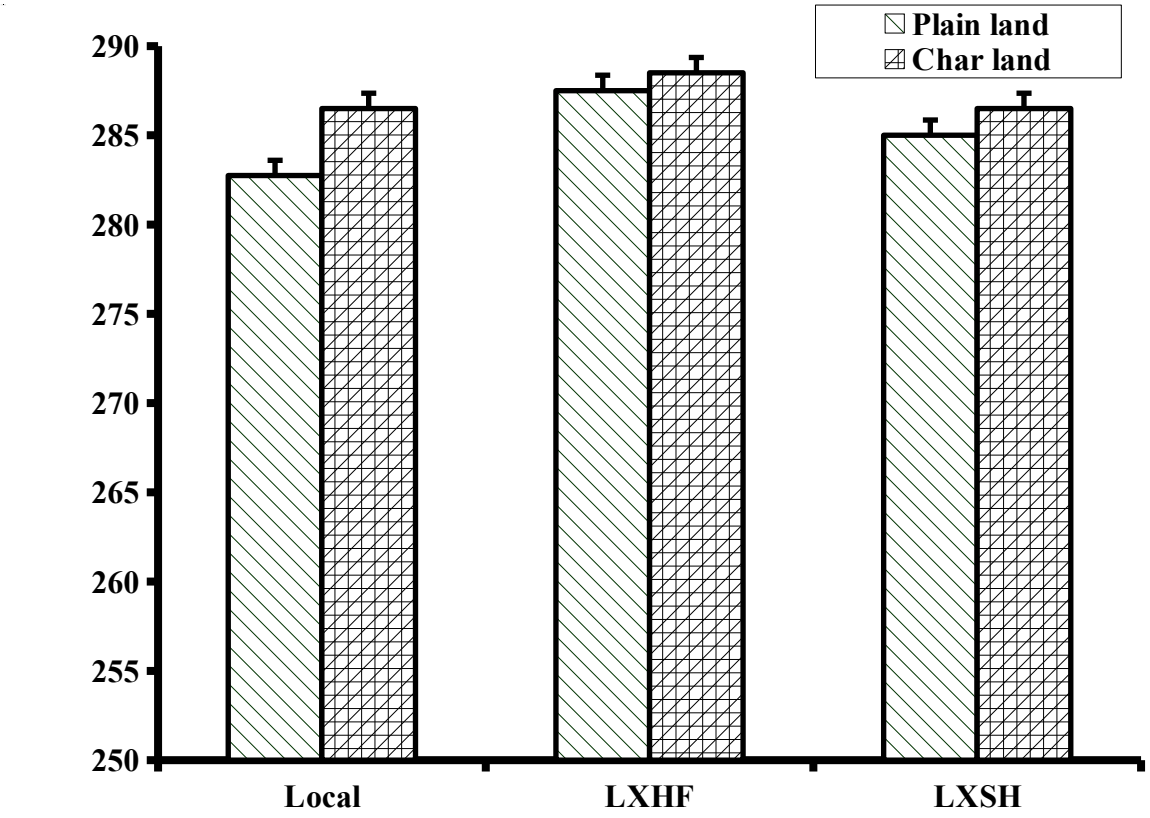
breeds were not significantly different ($p>0.05$) but slightly different among the breeds.



4.6 Gestation length

The length of gestation period was measured by the period between the date of calving and the date of conception. It was one of the indicators of the productivity performance of a dairy cow. The study reveals that the average length of gestation period for indigenous and cross bred cow like L×HF & L×SH at plain land were 282.75 days, 287.5 days & 285 days respectively. But in context of char area, the average length of gestation period for same cows was 286.5, 286.5 and 287.5 days respectively. Our result shown in below bar diagram that, the length of gestation period only for

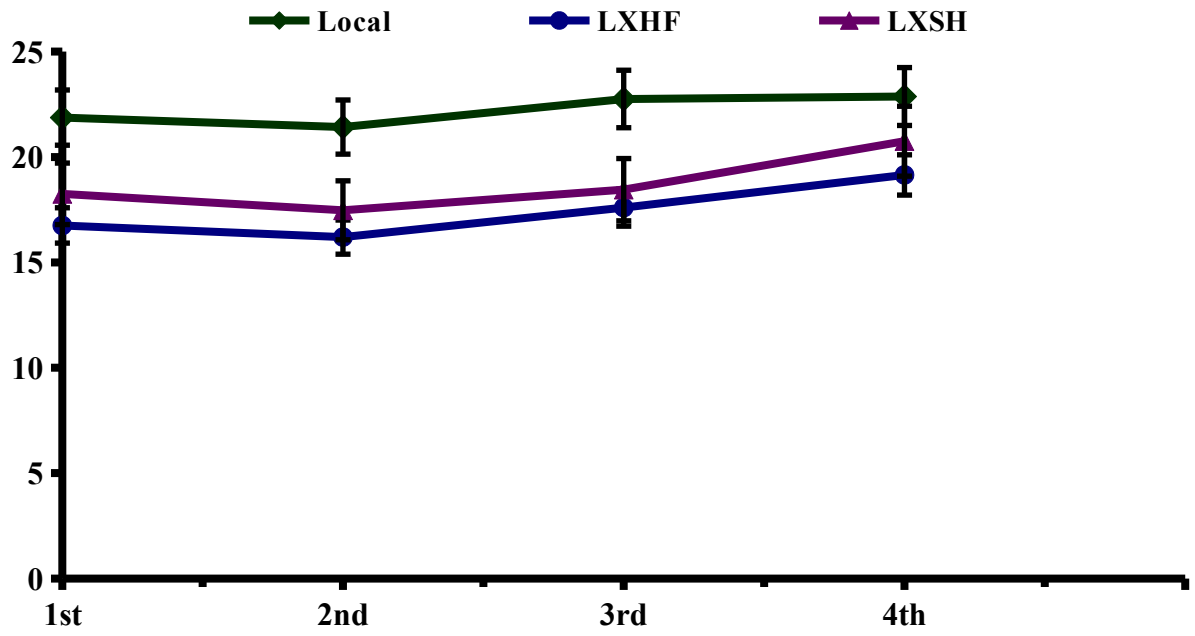
indigenous cow was significantly different.

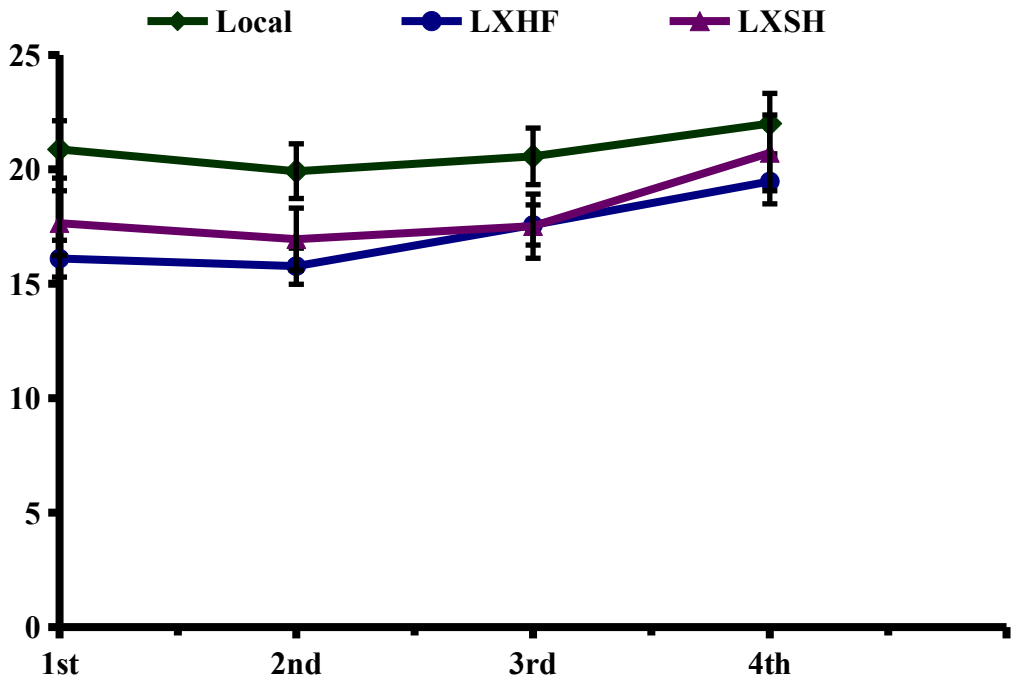


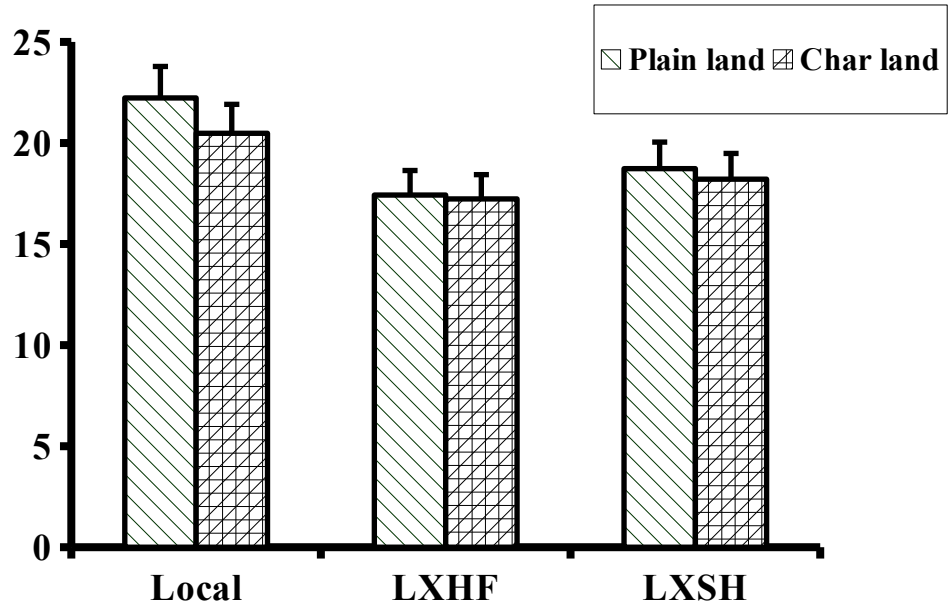
4.7 Calving Interval

Calving interval is one of the main indicators of the reproductive performance of a dairy cow**.** In this study calving interval was defined as the period of time from one calving to

another calving. The average length of calving intervals of indigenous and cross-bred cows like L×HF & L×SH stood at plain land were 683 days,552 days 613 days respectively. But in case of char area, the average lengths of calving intervals of indigenous and crossbred cows like L×HF & L×SH were 684, 533 and 561 days respectively. Statistically significant variation existed between the length of calving intervals of indigenous and cross-bred cows like L×HF & L×SH at line graph in plain and char area of Ulipur Upazila under Kurigram districts. But no significant different or slightly significant different among L×HF & L×SH crossbred cows at length of calving interval. But in case of Bar Diagram, there was no significant different among the breeds in calving interval.

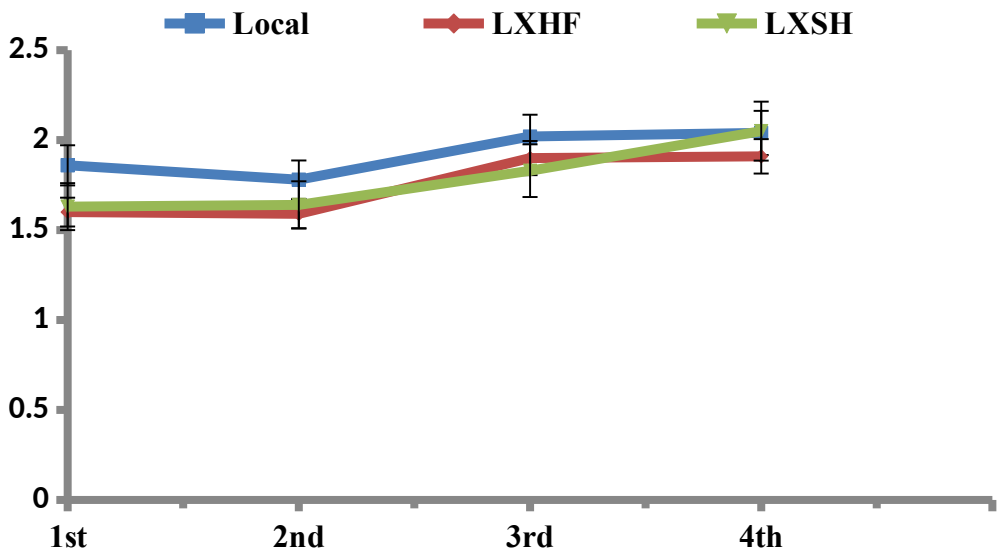


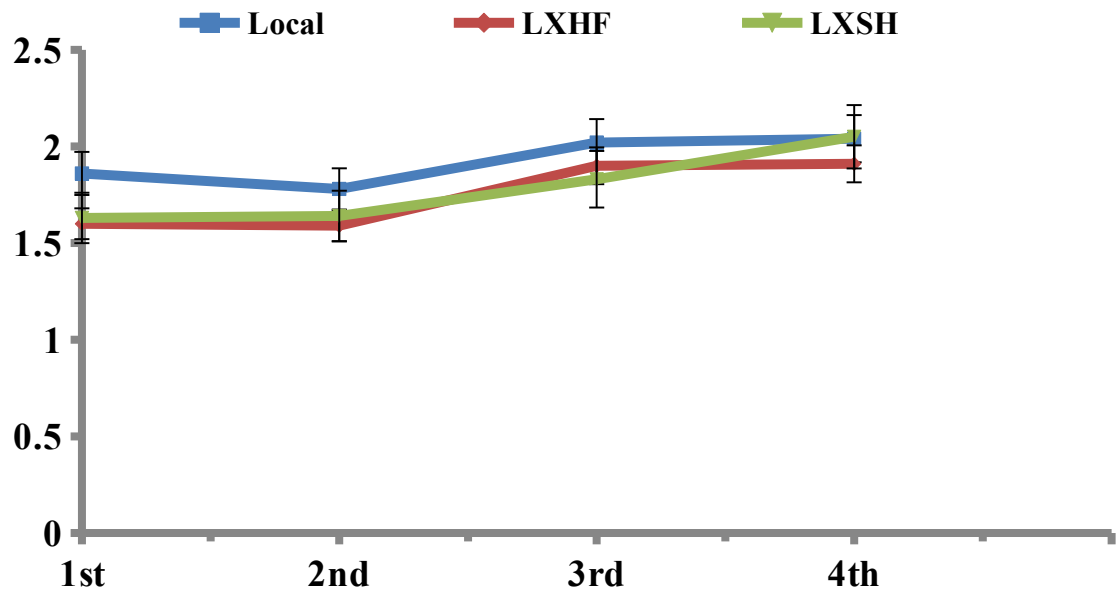

Local
LXHF
LXSH
25
20
15
10
5
0
1st
2nd
3rd
4th

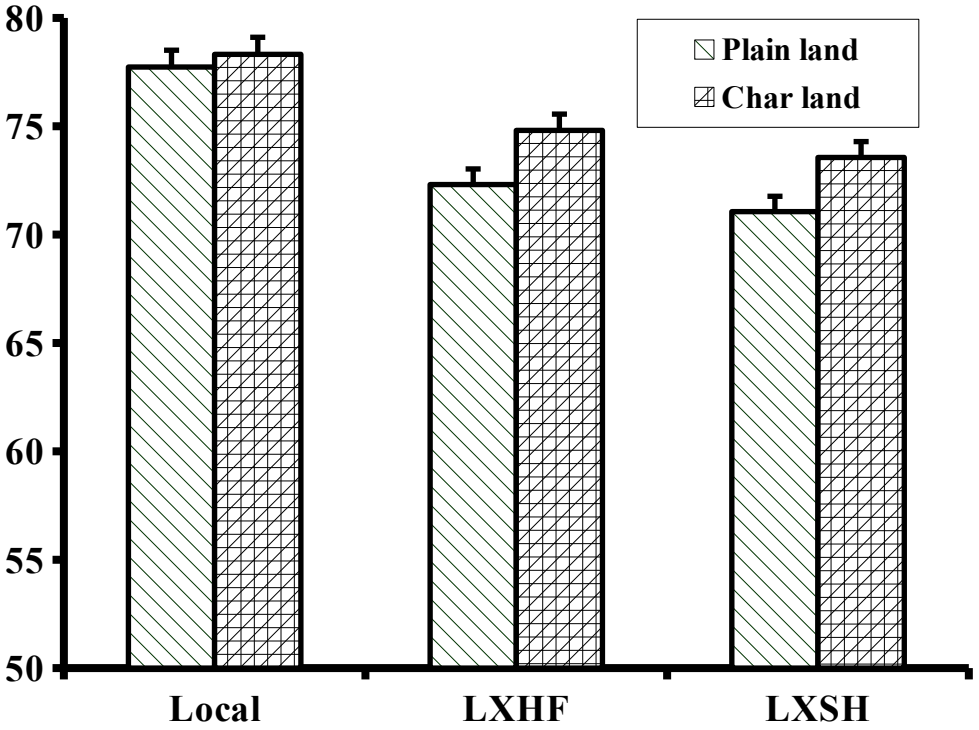

Plain land
Char land
25
20
15
10
5
0
Local
LXHF
LXSH

4.8 Conception rate and service per conception

The conception rate means the number of dairy cows conceived divided by number of dairy cows inseminated multiply by hundred. The rate of service per conception means the number of insemination required for each conception. These were treated as reproductive indicators of a dairy cow. The average conception rate of indigenous and crossbred cows like L×HF & L×SH at plain land were 59.41,72.31 and 71.01 percent respectively, but in context of char area the average conception rate of indigenous and crossbred cows like L×HF & L×SH were 60.07, 73.31 and 74.58 percent respectively. Average service per conception rate of indigenous and crossbred cows like L×HF & L×SH at plain land were 2.005 times,1.75 and 1.84 times respectively, but in context of char area, the average service per conception rate of indigenous and crossbred cows like L×HF & L×SH were 1.84 times,1.73 times & 1.78 times respectively. Our statistical results shown that there was a significant different among the breeds at plain and char area both at line graph and Bar diagram.

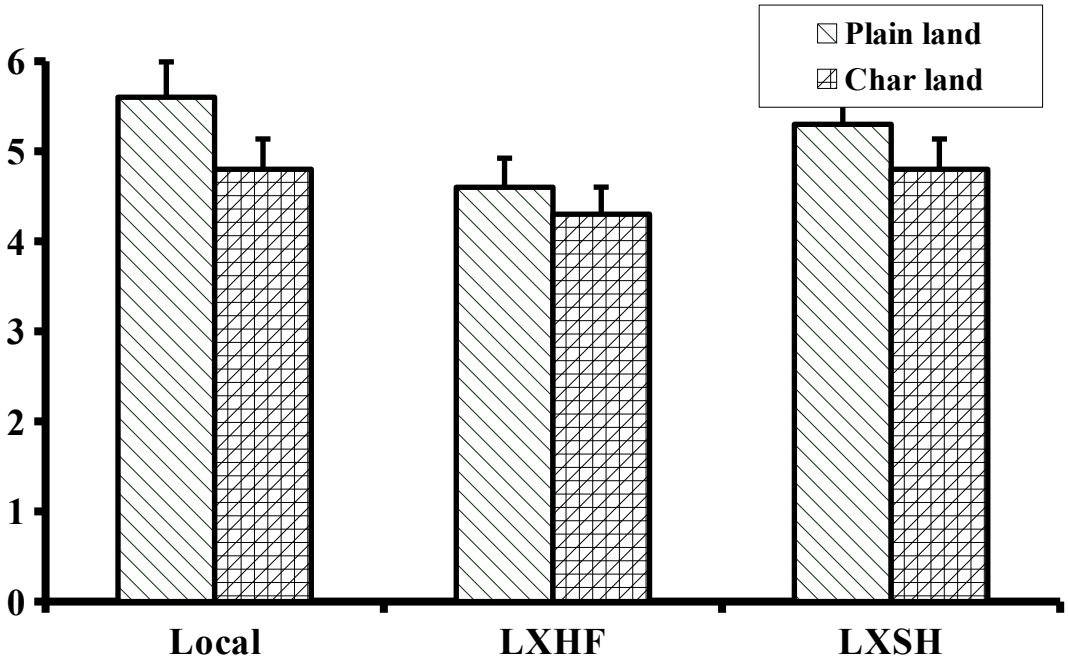



Local
LXHF
LXSH
2.5
2
1.5
1
0.5
0
1st
2nd
3rd
4th


80
75
70
65
60
55
50
Plain land
Char land
Local
LXHF
LXSH

4.9 Post-partum heat period

Post-partum heat period is defined as the calving to 1st service interval. That is, it is the number of days from calving to the first subsequent service of cow (Dairy Herd Fertility, 1984). Average post-partum heat period of Indigenous and crossbred cows like L×HF & L×SH of plain lands were 5.6 months, 4.6 and 5.3 months respectively, but in context of Char area the average post-partum heat period of Indigenous and crossbred cows like L×HF & L×SH of char lands were 4.85 months, 4.35 months and 4.8 months respectively.



Short summary of this study:

The present study showed the following results like:

1. The productive and reproductive performances of crossbred cow (L×HF) was comparatively higher than L×SH and Indigenous cows at plain and char area of

Ulipur Upazila at the point of view at average lactation length, Average lactation yield and gestation length of cow.

2. Age at first calving, average conception rate & average Calving interval of indigenous cattle at plain & char area are higher than the LxHF & LxSH crossbred cattle.

5. Problems related to dairy cow rearing

The purpose of this section are to identify the problems of raising dairy cows in selected area of Kurigram district and to make recommendations with a view to solving these problems, for the dairy cow owners. The problems of raising dairy cows and marketing of milk presented in table-03 as identified by the respondents. According to the opinion of the dairy cow owners the following problems were identified in raising dairy cows in the study areas.

Table: 03 the problems of dairy cow rearing in the study area:

Category →	% of Dairy cow owners reporting the Problems		
Problems ↓	Indigenous Cow raisers	Crossbred cow Raisers like LxHF & LxSH	All (Average)
Inadequate health care & veterinary services problem	30.75	64.25	47.5
Hybrid bull problem	30	42.50	36.25
Distance of AI center	12.50	31	21.75

Non conception of AI	25.50	12	18.75
Financial problem	28% dairy cow rearer felt this problem		
Lack of knowledge for rearing cow	12.72% dairy cow rearer felt this problem		

5.1: Feeds & Fodder scarcity

Scarcity of feeds and fodder was the most important constraints of dairy raising specially in the plain lands areas compared to the char areas.

5.2: Grazing land problem

Grazing of dairy cows was an important problem in the study areas. Because of the introduction of modern technology new infrastructural change and increasing need of housing, the grazing land is decreasing day by day and therefore grazing of dairy cows is becoming an acute problem.

5.3: Inadequate health care & veterinary services problem

Inadequate health care and veterinary services was another important problem of raising dairy cows in the study areas. Most of the dairy cow owners felt that the availability of the veterinary services was inadequate in the areas. About 64.25 per cent of indigenous cow raisers & 30.75 per cent of crossbred cow raisers mention this problem. Moreover supply of vaccines and medicines to the Thana level office was quite insufficient. Some of the respondents opined that when the medicines were available in the market, they could not buy them because prices were too high.

5.4: Hybrid bull problem

Non-availability of hybrid bull was another problem of raising dairy cows in the study area. Because the cow owner does not get AI service in time due to distance area. Table 03 shown that about 30 percent of indigenous cow raisers and 42.50 per cent of crossbred raisers felt this problem. Before independence of Bangladesh, good quality bulls were imported from the neighboring countries and they were used for cross-breeding and upgrading indigenous cows. But later on the import of cattle has been made difficult. But very recently (1993) the government introduced an incentive bonus scheme and duty free import of good quality hybrid cattle.

5.5: Distance of Al center

Al is one of the methods used for the improvement of indigenous cattle. It was found that about 31 per cent of crossbred raisers and 12.50 percent of indigenous **cow** raisers faced the problem of distance of Al Centre. It is interesting to note that about 25.50 per cent of the crossbred raisers reported the problem of non-conception of their dairy cows while only 7 percent of indigenous cow rearer considered this as a problem.

5.6: Financial problem

Financial problem was one of the constraints for the development of dairy enterprises. Tab1e 03 shows that about 28 percent of dairy raisers could not develop their dairy enterprises due to financial problem.

5.7 Lack of training:

Knowledge on animal husbandry is essential for the development of dairy enterprises. About 12.72 percent of dairy raisers felt that their knowledge on animal husbandry were

not sufficient and therefore, they considered the lack of proper training facilities as one of the constraints for the development of their dairy enterprises.

Table 04. Problems of milk marketing in the selected areas.

Category →	% of Dairy cow owners reporting the Problems		
Problems ↓	Indigenous Cow raisers	Crossbred cow Raisers like LxHF & LxSH	All (Average)
Distance of Market	30.50	52.25	41.37
Low prices of milk	38.00	60.60	49.3
Fraudulent Practices	15.25	20.22	17.73
Crisis of Labour	18.50	18.50	18.50

The following problems of milk marketing were identified in the study area,

5.8 Distance of Market:

Distance of market was one of the problems of milk marketing. About 30.50 percent of indigenous cow raisers and 52.25 per cent of crossbred raisers mentioned the distance of market as a problem of milk marketing.

5.9 Low Prices of Milk:

The price of milk in the study areas was low. The average price of milk per liter in the study area was estimated at Taka 23. About 38 per cent of indigenous cow raiser and 60.60 per cent of crossbred raisers mentioned this as a lower price.

5.10 Fraudulent practices:

In the study area it was found that the majority of dairy raisers used to sell milk at home to Goala. About 15.25 per cent of indigenous cows raisers and 20.22 per cent of crossbred cow raisers reported that they were cheated by the Goala through the use of fraudulent weights and measures.

5.11 Crisis of labour:

Crisis of labour was another marketing problem in the study area, about 18.50 per cent of both the categorical of farmers felt this problem and they had to sell of milk at home at lower prices due to shortage of labour.

CHAPTER V

SUMMARY AND CONCLUSION

Chapter V

Summary and Conclusion

The present study was conducted for a period of six months in one Upazila of Kurigram District under Rangpur Division. A total of 96 available cows (L×HF, 32 and L×Sh, 32 and Indigenous cow, 32) were selected for this study. The collected data were compiled, decoded and analyzed statistically. As regards determination of productive & reproductive performance of L×HF and L×SH crossbred and Indigenous dairy cows; we found that the average milk yield of L×HF, L×SH crossbred and Indigenous cows were 9.13 liters, 6.37 litters and 1.84 liters in plain lands where 9.81 liters 6.63 litters and 2.29 liters in char area of Ulipur Upazila respectively. The daily milk yield of L×HF crossbred cows were significantly ($p<0.05$) increased compared to the others breeds. The average lactation length of L×HF, L×SH crossbred and Indigenous cows were 251 days, 245 days and 183 days in plain land where 254 days, 247 days 192 days in char area of Ulipur Upazila of Kurigram district respectively. Lactation length of L×HF and L×SH cows were significantly increased ($p<0.05$) in plain and char area of Ulipur at line graph but in bar diagram only Indigenous breeds shows the significant different but not significant in L×HF and L×SH crossbred cows. As regards determination of reproductive performance of L×HF, L×SH crossbred and Indigenous dairy cows, we found that the average age at first heat were 25.25 months, 27.75 months and 33.75 months in plain land where 20.5 months, 24.5 months and 30.5 months in

char area of Ulipur Upazila of Kurigram district respectively. The age at first heat of L×HF and L×SH crossbred and indigenous cows were significantly ($p<0.05$) different in plain and char area of Ulipur Upazila. The service per conception were 1.61 times, 1.67 times & 1.80 times in 2nd Pariety of plain plan in L×HF and L×SH crossbred and Indigenous cows whereas service per conception were 1.59 times, 1.63 times & 1.78 times in char area of Ulipur Upazila respectively. The service per conception in L×HF, L×SH crossbred and Indigenous cows were significantly ($p<0.05$) different in plain and char area of Ulipur Upazila. The age at first calving of L×HF and L×Sh crossbred and Indigenous cows were 34.75 months 36.12 months and 44 months in plain land whereas 33.75 months, 32.5 months & 41.5 months in char areas of Ulipur Upazila respectively. The age at first calving of L×HF and L×Sh crossbred cows and indigenous cows were not significantly ($p>0.05$) different in plain and char area in Ulipur Upazila under Kurigram district. The average gestation length of L×HF, L×Sh crossbred and Indigenous cows were 287.5 days 285 days and 282.75 days in plain land whereas 287.5 days 286.5 days and 282.5 in char area of Ulipur Upazila respectively. However the values have no significant differences ($P>0.05$) between the groups of cows in that area. The post-partum heat period of L×HF, L×Sh crossbred and Indigenous cows were 4.6 months 5.3 months and 5.6 months in plain land whereas 4.3 months 4.8 month and 4.85 months respectively in char area respectively. The post-partum heat period in L×HF, L×Sh crossbred and Indigenous cows were not significantly ($p>0.05$) different among the breeds at plain and char area of Ulipur Upazila. The average calving interval were 17.42 months, 18.73 months and 22.23 months in L×HF, L×Sh crossbred and Indigenous cows at plain land whereas 17.23 months 18.21 months and 20.84 months

respectively at char lands respectively at Ulipur Upazila. Calving interval of L×HF, L×Sh crossbred and Indigenous cows were not significantly ($p>0.05$) different among the breeds both under plain and char area of Ulipur Upazila. In the socio-economic aspects of Bangladesh, it is crying to improve the productive and reproductive performance of crossbred and Indigenous dairy cows. The present result revealed that the productive and reproductive performances of crossbred cow (L×HF) was comparatively higher than L×SH and Indigenous cows at plain and char area of Ulipur Upazila at the point of view at average lactation length, Average lactation yield and gestation length of cow. Age at first calving, average conception rate & average Calving interval of indigenous cattle at plain &char area are higher than the LxHF & LxSH crossbred cattle.

So it may be suggested that the farmers of Kurigram District should provide improve feeding as well as technical support to their crossbred and Indigenous cows to achieve better performances. Finally the author explains that, the performance of char dwelling animal is better compared to the plain land animal for the following sensible reasons viz:

1. Char area is the good source of natural grazing of char dwelling animal and they are freely graze on that area and take natural green grass from it resulting increase milk production as well as conception rate of the animals.
2. Some minerals elements are essential for reproductive growth of the animal that is available in green grass of char area compared to the plain land green grass.
3. Silent heated animal are easily pregnant at char area compared to the plain land due to available bull freely graze on the char land area.

4. Lactation length of indigenous and crossbreed animal are higher at char area compared to the plain land due to huge amount of green grass are available at char land area.

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APPENDIX

Appendices

Appendix 1. Pre – tested questionnaire for interviewing the farmer along with other necessary records

For M.Sc. Student, Department of General Animal Science & Nutrition,

Hajee Mohammad Danesh Science and Technology University, Dinajpur, Bangladesh.

"A COMPARATIVE STUDY ON THE PRODUCTIVE & REPRODUCTIVE ERFORMANCE OF DAIRY CATTLE AVAILABLE IN CHAR & PLAIN LAND AREAS OF ULIPUR UPAZILA IN BANGLADESH"

1. Name of the dairy cow owner :

   Village :

   Upazila :

   District :
2. Occupation :
3. Total number of animals :

Cattle	Indigenous	Cross-bred	Total

Number			

4. What types of feed supply?

Particulars		Green grass & straw	Oil cake	Wheat bran	UMS and UMB	Salt	Urea + straw	Grazing	molasses	Others
Indigenous		Plain								
		Char								
Crossbred	LxHF	plain								
		char								
	LxSH	Plain								
		char								

5. Can you give the information about following parameters?

Parameters	Land	Indigenous				Crossbred			
	Plain/ Char	Cow-1	Cow-2	Cow-3	Cow-4	Cow-1	Cow-2	Cow-3	Cow-4
No. of lactation	Plain					LxHF			
						LxSH			
	Char					LxHF			
						LxSH			
Period of lactation	Plain					LxHF			
						LxSH			
	Char					LxHF			
						LxSH			
Age at first heat	Plain					LxHF			
						LxSH			
	Char					LxHF			
						LxSH			

Service per Conception	Plain					LxHF			
						LxSH			
	Char					LxHF			
						LxSH			
Conception rate	Plain					LxHF			
						LxSH			
	Char					LxHF			
						LxSH			
Age at first calving	Plain					LxHF			
						LxSH			
	Char					LxHF			
						LxSH			
Gestation length	Plain					LxHF			
						LxSH			
	Char					LxHF			
						LxSH			

Post-partum heat period	Plain					LxHF			
						LxSH			
	Char					LxHF			
						LxSH			
Calving interval	Plain					LxHF			
						LxSH			
	Char					LxHF			
						LxSH			

5. Are you interested to AI and what kind of bull and why?

AI	yes	No

Name of bull	

Yes	Comparatively large cow	Good Looking	Higher milk Production	Higher Price of Calf	others

No	Higher Mortality of calf	Parturition problem	Low price of milk	Tasteless milk	Draft problem	others

6. What are the problems of Dairy cow rearing?

Problems	Indigenous cow Rearer	Cross-bred cow Rearer
Feed & Fodder		
Grazing		
Veterinary care & service		
Disease		
Hybrid bull		
Financial Problem		
Distance of AI Center		
High price of veterinary medicine		
Lack of Training & Extension		
Milk Marketing		

7. What are the probable solutions of dairy cow rearing?

Money	land	HYV fodder	Hybrid bull	Vet. Care and	AI Centre	others

		production		services		

Signature of Surveyor:

Date: