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STUDY ON PRESENT STATUS OF DAIRY FARMING AT SADAR UPAZILA OF RANGPUR DISTRICT

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ABSTRACT

This study was conducted to investigate the present status of dairy farming through a field survey at Rangpur Sadar Upazila, Rangpur, Bangladesh from December 2020 to December 2021. A total of 14 indigenous and 95 crossbred cows were selected randomly from the selected dairy herds. The results indicated that most of the farmers were male (25-35 years) and 17.24% of farmers involved in dairy farming were graduated. With regards to the housing system, the percentage of rearing system was found equal and the majority of the farmers could not afford fodder cultivation (70%). In the case of cross-breed animals like HF cross the farmers provided green grass and concentrate in a high amount of 11.03±0.76 kg and 4.82±0.33 kg per animal per day respectively. Likewise, straw feeding was found higher in indigenous animals (06.64±0.55 kg/animal/day). Most of the farmers followed AI (91.7%) with frozen semen (99.08%) for reproduction purposes in which 37.61% of cows need double services for conception. The age of first puberty was lower (19.97±0.57 months) in HF cows. In contrast, the average number of services per conception was lower in indigenous cows which were 1.95±0.14. The average milk yields of indigenous, HF, and SL crossbred cows were 2.36±0.118, 15.07±0.457 and 3.2±0.287 L/day/cow, respectively. However, enhancing the availability of feeds and fodder, the proper market price of milk, and minimization of veterinary costs might improve dairy production in the study area as well as in other districts of Bangladesh.

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INTRODUCTION

Livestock is part and parcel such an agricultural country like Bangladesh where 80% of the rural population is engaged in rearing cattle (Rahim *et al.*, 2018). Livestock is an integral part of complex farming system; contributing significantly towards the development of nation through multidimensional approach like poverty reduction, employment generation and nutritional security. Livestock provides employment 20% directly and 50% partly. It also plays an important role in the economy of Bangladesh with a direct contribution around 1.44% to the nation's Gross Domestic Product (GDP), which is 13.10% of the total Agricultural GDP and growth rate of livestock sector (Current prices) is 3.80% (DLS, 2020). The contribution of Livestock by the products such as milk, meat is the main source of animal protein. The requirement of meat is 120 gm/day/head and the production is 136.18 gm/day/head on the other hand the requirement of milk is 250 ml/day/head but the availability is 193.38 ml/day/head (DLS, 2020).

Cattle are an integral part of the existing smallholder subsistence farming of Bangladesh. In our country major portion of milk is produced by the rural households (Siddique *et al.*, 2010). Although milk produced by the rural household is little but it play a greater role to develop a healthy nation (Uddin *et al.*, 2011). Commercial dairy farming is a new gesture in our country. Recently large number of dairy farms has developed throughout the country due to increasing demand of milk and meat. Huge amount of milk is imported every year due to the demand for milk is constantly increasing in cities as well as small towns and rural areas (Rashid *et al.*, 2015) The factors influencing this increased demand are rapid increase in population, spread of education, growing nutritional awareness and improved purchasing power of consumers. The increase in human population has a direct effect on the demand for food. However, globally there is shrinkage of cultivable lands, which makes the role of livestock sector even more important, not only in terms of nutritional security but also employment generation. Our dairy farming faces a lot of problem. To overcome this problem more research is needed. The present study was undertaken with the objectives to investigate the present status of dairy production performances and to know about the different management systems followed by the farmers.

METHODOLOGY

Study area

This study was conducted by a field investigation at Rangpur Sadar Upazila of Rangpur district in Bangladesh during December 2020 to December 2021. The study area of Rangpur Sadar Upazila was Dhaap, Kamal Kasna, Robertsonganj, Mondolpara, Kuthirpara, BaharKasna, Munshipara, Mulatolepara, Keranipara, Gomostapara, New Engineer para, Kotkipara, Deudoba, Dangirpara, Palapara (also named Pakpara), Lalbagh. Mominpur is one of the unions in Rangpur sadar upazila.

Animals

Most of the cattle found in Rangpur Sadar Upazila were crossbred. Indigenous cows were very rare. However, the surveyed animals were Indigenous, HF cross and SL cross.

Data collection and organization

There were 29 farmers who were participated during this study period of December 2020 to February 2021. A preformed questionnaire was carefully prepared related to the objectives of the study. In the questionnaire the questions were simple, direct and easily understandable by the respondents. Individual animals information on breed, age, calf number, record of AI, nutritional status, housing system, production performance, vaccination, deworming and disease history were recorded by interviewing the owner. The Body Condition Score (BCS) was measured on eye estimation and scored as 2.0, 2.5, 3.0, 3.5 and 4.0. The Upazila Livestock Officer (ULO), Veterinary Surgeon (VS) and Livestock Extension Officer (LEO) were the source of some secondary information regarding the several farms, cattle population, workshops, vaccination campaign, deworming programs and several extensions works in their respective Rangpur Sadar Upazila.

Statistical Analysis

The obtained data were inputted in spreadsheets (Excel 2013; Microsoft office professionals, 2013) for analysis and using statistics software (STAT/IC-14.0), (Stata Corp, 4905, Lake Way Drive, College station, Texas, USA. All the collected data were subjected to analysis of variance (ANOVA) for a factorial design using the General Linear Models (GLM) procedure of Statistical Analysis System (SAS, 2009) with 3 genotypes. Duncan's Multiple Range Test (DMRT) was used to determine the significant differences among means.

RESULTS

Information about farmers and farm

The major variables that reflect the farmers characteristics which were the age, gender and level of education are presented in Table 1. With regards to the gender most of the households were male (79.31%) whereas 20.69% respondents were female involved in dairy cattle rearing. In terms of age structure most of the farmers were between 25-35 years which corresponds to 41.38% followed by 36-45 (37.93%) years and 46-60 (20.69%) years respectively. In the level of education, majority of the farmers' level was up to the primary (37.93%) whereas 17.24% did not have any education. There was 17.24% graduate found involved in dairy farming.

Table 1. Farmer's characteristics of dairy farming at the study area

Variable	Categories	Frequency (n)	Percentage (%)
Gender	Male	23	79.31
	Female	06	20.69
Age	25-35 years	12	41.38
	36-45 years	11	37.93
	46-60 years	06	20.69
Educational Status	No	05	17.24
	<5	11	37.93
	6 to 10	06	20.69
	11 to 12	02	06.90
	Graduate	05	17.24
Total (N)		29	100

Rearing system

With regards to housing system, the percentage of rearing system was found equal (Table 2).

Table 2. Rearing system by the farmer's at the study area

Variable	Categories	Frequency (n)	Percentages (%)
Housing System	Intensive	15	51.72
	Semi-intensive	14	48.28
Total		29	100

Fodder cultivation practice by the farmers

Majority of the farmers could not afford fodder cultivation (70%). The percentage of fodder cultivation practice by the farmers was 30% (Table 3).

Table 3. Fodder cultivation practices at the study area

Characteristics	Categories	Frequency (n)	Percentages (%)
Fodder cultivation	Yes	09	30.00
	No	21	70.00
Total		29	100

Feeding management of the dairy cows

As most of the farmers could not afford the fodder cultivation they practice traditional management system. But only a few owners had their own field for producing grasses over the year. The farmers provided rice straw most of the time. In case of cross breed animals the farmers provided green grass in a high amount. Each animal were provided straw, green grasses and concentrate with access to drinking water. Table 4 showed that the highest amount ($P<0.001$) of green and concentrated were supplied to HF Crossbred cattle than that of other cattle.

Table 4. The average amount of feed provided to cow

Feed Types	Indigenous (n=14)	HF Cross (n=89)	SL Cross (n=6)	Level of significant
Green Grass (kg)	4.42 ^b ± 0.61	11.03 ^a ± 0.76	2.83 ^b ± 0.31	***
Concentrate (kg)	1.21 ^b ± 0.33	4.82 ^a ± 0.33	0.5 ^b ± 0.34	***
Straw (kg)	6.64 ^a ± 0.55	5.77 ^a ± 0.23	5.5 ^a ± 0.34	NS

SE-Standard Error, Row wise different super script denote significant level at * $P<0.05$, ** $P<0.01$, *** $P<0.001$, NS-Non significant.

Animal health information of the dairy farms

According to the disease history the prevalence of FMD and LSD was higher at the study period 47.05 and 39.21% respectively (Table 5).Majority of the farmers follow vaccination schedule. Half of the respondents followed regular deworming schedule (Table 6).

Table 5. Response of farmers towards the diseases

Name of the disease	Frequency (n)	Percentages (%)
FMD	24	47.05
LSD	20	39.21
Mastitis	04	07.84
Anaplasma	03	05.90
Total (N)	51	100

Note: FMD= Food and Mouth Disease, LSD= Lumpy Skin Disease

Table 6. Preventive measures taken by the farmers

Cases	Criteria	Frequency (n)	Percentage (%)	
Vaccination	Yes	Regular	17	58.62
		Irregular	07	24.13
	No	05	17.25	
Deworming	Yes	Regular	15	51.72
		Irregular	05	17.25
	No	09	31.03	
Total		29	100	

Reproductive characteristics of the dairy cows

In table 7the breeding performances of the dairy cow are described where the regular oestrus cycle of dairy cows is showed in higher number. Most of the farmers followed AI (91.7%) by frozen semen (99.08%) for reproduction purpose in which 37.61% cows need double services for conception.

Table 7. Breeding information of dairy cow

Breeding History	Criteria	No. of Respondents	Percentages (%)
Oestrus	Regular	78	71.55%
	Irregular	31	28.45%
Types of Service	AI	100	91.74%
	Natural	04	3.67%
	Both (Natural +AI)	05	4.59%
Service/Conception	Single	17	15.60%
	Double	41	37.61%
	Third	32	29.36%
Types of Semen Used	Fourth	19	17.43%
	Frozen	108	99.08%
	Liquid	01	0.92%
Total		109	100

Reproduction performance of the dairy cows is illustrated in the Table 8. Higher ($P < 0.001$) age of puberty was recorded for indigenous cattle then that of other cattle. The age of first puberty was calculate as 38.75 ± 2.76 , 24.34 ± 0.34 and 19.97 ± 0.57 months for indigenous, SL and HF cows respectively. The average number of service per conception for indigenous, HF and SL crossbred cows were 1.95 ± 0.14 , 2.30 ± 0.06 and 2.5 ± 0.17 respectively. There was no significant variation was found in case of calving intervals and gestation period among the available breeds.

Table 8. Reproduction performance of indigenous and crossbred cows

Categories	Indigenous (n= 14)	HF Cross (n= 89)	SL Cross (n= 06)	Level of significant
Age of first puberty (Months)	$38.75^a \pm 2.76$	$19.97^b \pm 0.57$	$24.34^b \pm 0.34$	***
Service/Conception (No)	$1.95^a \pm 0.14$	$2.30^a \pm 0.06$	$2.5^a \pm 0.17$	NS
Calving intervals (Days)	$391.25^a \pm 4.78$	$380.41^a \pm 1.71$	$390^a \pm 5.79$	NS
Gestation period (Days)	$278.25^a \pm 0.67$	$279.15^a \pm 0.35$	$278^a \pm 1.15$	NS

SE-Standard Error, Row wise different super script denote significant level at * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$, NS-Non significant.

Productive performances of dairy cows

The dairy cow's production performances in terms of daily milk yield and lactation period are presented in the table 9. Indigenous cattle were found as the lowest producer whereas HF crossbred cows were highest ($P < 0.001$). The average milk yields of indigenous, HF and SL crossbred cows were 2.36 ± 0.118 , 15.07 ± 0.457 and 3.2 ± 0.287 L/day/cow, respectively. Lactation period among the breeds also varied significantly ($P < 0.001$). The average lactation period of indigenous, HF and SL crossbred cows were 203.75 ± 16.47 , 298.21 ± 5.26 and 180 ± 5.78 days respectively.

Table 9. Dairy cow's production performances in different genotypes

Parameter	Cattle Breed	Mean \pm SE	Level of significant
Daily milk yield (L)	Indigenous	$2.36^b \pm 0.118$	***
	HF Cross	$15.07^a \pm 0.457$	***
	SL Cross	$3.2^b \pm 0.287$	***
Lactation Period (Days)	Indigenous	$203.75^b \pm 16.47$	***
	HF Cross	$298.21^a \pm 5.26$	***
	SL Cross	$180^b \pm 5.78$	***

SE-Standard Error, Row wise different super script denote significant level at * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$, NS-Non significant.

In the study, the target was to illustrate the major problems faced by the farmers which are represented in Table 10. More than 65% of the farmers fell short of capital for running their farms. Similar percentage of farmers faced difficulties in supplying adequate amount of feed. As over 50% of the farmers claimed the low price of milk but over 60% farmers said they had no marketing problem of milk. About 82% of the farmers were unhappy with the price of concentrate feed was beyond their capacity. Though most of the farmers could afford the cost of artificial insemination but they faced problem with the costly veterinary services.

Table 10. Major problems faced by the respondents

Issues	Criteria	Frequency (n)	Percentage (%)
Capital shortage	Yes	09	31.03
	No	20	68.97
Feed shortage	Yes	19	65.51
	No	10	34.49
High price of Concentrate	Yes	24	82.75
	No	05	17.25
Low price of Milk	Yes	18	62.06
	No	11	37.94
Marketing problem of Milk	Yes	11	37.94
	No	18	62.06
Knowledge about Semen	Yes	12	41.37
	No	17	58.63
Source of Semen	Government	25	86.20
	BRAC	04	13.80
Cost of Artificial Insemination	Affordable	19	65.51
	Unaffordable	10	34.49
Cost of Veterinary Service	Affordable	11	37.94
	Unaffordable	18	62.06
Total (N)		29	100

DISCUSSION

The present study shown that more than three-fourth of households was run by male which is usual feather of male dominated society of Bangladesh (Chowdhury *et al.*, 2009). In terms of age structure most of the farmers were between 25-35 years which corresponds to 41.38% it seems most of them were young participants. Modern farming management demands for well educated person to make it a successful enterprise (Palta singh *et al.*, 2018). In the level of education, majority of the farmers' level was up to the primary education. And day by day the graduated people are involving in dairy farming (Table 1).With regards to housing system, the percentage of rearing method like intensive and semi-intensive pattern was found equal (Table 2). Although fodder is essential for dairy farming but 70% farmer in the study area do not cultivate any fodder, rather they fed their cows with purchased grass, roadside grass, tree leaves as succulent feeds (Table 3) supported by Islam *et al.*, (2017).In case of cross breed animals like HF cross the farmers provided green grass and concentrate in a high amount 11.03 ± 0.76 kg and 4.82 ± 0.33 kg per animal per day respectively (Roy *et al.*, 2016). The straw feeding found higher in indigenous animals (06.64 ± 0.55 kg/animal/day) shown in Table 4. Each animal were provided straw, green grasses and concentrate with access to drinking water. The prevalence of FMD and LSD was higher at the study period 47.05 and 39.21%, respectively. The presence of *Anaplasma* (05.90%) was also concerning for dairy farming (Table 5).Vaccination is one of the major prevention measures to control the infectious diseases where 17.25% respondents were not aware of vaccination. Half of the respondents followed regular deworming schedule (Table 6).

In table 7 the breeding performances of the dairy cow are described where the regular oestrus cycle of dairy cows is showed in higher number. Most of the farmers followed AI (91.7%) by frozen semen (99.08%) for reproduction purpose in which 37.61% cows need double services for conception. Reproduction performance of the dairy cows is illustrated in the Table 8. There was a significant difference between the ages of first puberty among the available breeds. The age of first puberty was calculate as 38.75 ± 2.76 , 24.34 ± 0.34 and 19.97 ± 0.57 months for indigenous, SL and HF cows respectively. The average number of service per conception for indigenous, HF and SL crossbred cows were 1.95 ± 0.14 , 2.30 ± 0.06 and 2.5 ± 0.17 respectively. There was no significant variation was found in case of calving intervals and gestation period among the available breeds. The average milk yields of indigenous, HF and SL crossbred cows were 2.36 ± 0.118 , 15.07 ± 0.457 and 3.2 ± 0.287 L/day/cow, respectively. The present findings supported by Siddique *et al.*, (2010). Lactation period among the breeds also varied significantly. The average lactation period of indigenous, HF and SL crossbred cows were 203.75 ± 16.47 , 298.21 ± 5.26 and 180 ± 5.78 days respectively (Table 9). The challenges has been faced by the farmers, credit shortage has been emerged as a common problem resulted in small number of cow in rural households (Table 10). This information is in agreement with the findings of Quddus *et al.*, (2018) who states that marginal farmers do not have access to formal credit facilities and they become helpless to get adequate capacity supply. Scarcity of land, unavailability of good quality fodder seeds and more emphasis on crop cultivation leads to shortage of feed in the study area. Moreover, a significant proportion of the respondents become unable to feed concentrate to their cow because of its high price. As there was objection on low price of milk but the farmers was happy because there was no marketing problem of milk. In addition, shortage of government veterinary surgeon, demanding high fees for veterinary service claimed by majority of respondents.

CONCLUSION

This study revealed the present status of dairy farming at Rangpur Sadar Upazila in Rangpur where most of the man, middle aged and educated people were involving in dairy cattle farming. The percentage of rearing system was found equal between intensive and semi-intensive and majority of the farmers could not afford fodder cultivation. Green grass and concentrate was provided higher in HF cross where the straw feeding found higher in indigenous animals. Most of the farmers followed AI by frozen semen for reproduction purpose in which cows need double services for conception. The age of first puberty and service per conception was lower but the average milk yields and lactation period was higher in HF cross. This study revealed that, HF cross breeds performed higher than other cattle breeds. However, enhance the availability of feeds and fodder, proper market price of milk and minimization of veterinary cost might be improve the dairy production at the study area as well as other district of Bangladesh.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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