An Official Journal of Bangladesh Livestock Research Institute (BLRI)
Bangladesh Journal of Livestock Research
Journal Homepage: https://www.banglajol.info/index.php/BJLR
ISSN 1022-3851

Current scenario of cattle breeding practices in Netrokona district

Eshtiak Ahamed Pehan[1]*, Shahanaj Ferdousi Shejuty[2], Md Rafikul Islam[3], Syed Sakhawat Husain[3] and M.A.M. Yahia Khandoker[3]

[1]Dairy Research and Training Center, Bangladesh Livestock Research Institute, Savar, Dhaka-1341, Bangladesh; [2]Biotechnology Division, Bangladesh Livestock Research Institute, Savar, Dhaka-1341, Bangladesh; [3]Department of Animal Breeding and Genetics, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh

Abstract

The present study was conducted to evaluate the cattle genotype and their distribution pattern, socio-economic status of the farmers, existing cattle breeding strategies and their facilities to understand the cattle breeding scenario in Netrokona district, Bangladesh. A total of 80 farmers (8 farmers from each upazilla) were surveyed from 10 Upazillas in Netrokona district. Each farmer's gender, age, educational level, family size, income, number of family members involved in cattle rearing, cattle genotypes and breeding practices of the cattle were assessed in-depth. The results of the survey study revealed that 85% farmers were males and 15% farmers were female in the respective area. The majority of farmers (55.84%) had a medium size farm having 4-6 number of cattle per family. Within the surveyed region 83.12% farmers practiced artificial insemination (AI) for cattle breeding, whereas 16.88% still practiced natural mating by using their own bulls. In the study areas, the majority of farmers (75%) considered AI to be simpler than natural mating. While choosing bull for breeding services, Holstein-Friesian cross (31.18%) was first priority for the farmers followed by Sahiwal cross (20.35%), local (18.21%), Red Chittagong cattle (11.69%), Brahman (8.22%), Red Sindhi (5.19%) and Jersey (4.76%) respectively. In conclusion, this study on the current scenario of cattle breeding practices in Netrokona district provides valuable insights on major constrains and prospects of cattle breeding scenario in Netrokona district that can inform targeted interventions and policies, fostering sustainable and improved outcomes for the improvement of cattle breeding strategy for the local farmers.

Key words: Artificial insemination, Bull, Breeding practices, Dairy cattle and Genotypes

Bang. J. Livs. Res. Vol. 29 (1&2), 2022: P. 53-61. https://doi.org/10.3329/bjlr.v29i1.72076

Introduction

Cattle breeding is a crucial aspect of efficient livestock production to fulfil the demand of milk and meat in Bangladesh. Due to increasing consumer preferences, market dynamics, and the rising need for

*Correspondence: eshtiakahamed151@gmail.com

meat and diversified dairy products, the livestock industry has seen tremendous transition in recent years. Being a vital component of agriculture, livestock contributes 1.85% in the gross domestic product (GDP) in Bangladesh, and 6% of total foreign exchange earnings come from this sector (BER, 2023). In Bangladesh, the cattle industry provides employment for about 20% of the people directly and 50% of them indirectly (Draft SFYP, 2015). The availability of meat and milk per person in Bangladesh is 137.38 g/day and 221.89 ml/day, respectively (BER, 2023). Bangladesh has the greatest potential with proper utilization of its huge manpower to increase milk and meat production (Islam *et al.*, 2017). Bangladesh has both improved deshi variants, such as Pabna cattle, Red Chittagong cattle, Munshiganj cattle, and North Bengal Grey cattle, and exotic breeds, such as Holstein-Friesian, Jersey, Shahiwal, Hariana, and Sindhi (Bhuiyan, 2013). In the current low input management approach, around 85% of native cattle produce noticeably superior to other cattle. (Hossain *et al.*, 2006). Now-a-days, educated farmers are getting more interested in cattle farming and crossbreds or high yielding cattle are on their first priority over the local genotypes for higher milk and meat production. As a result, farmers are adopting new breeding practices to improve the productivity and profitability of their cattle.

The Government has taken various steps to improve cattle breeding systems, and various private organizations are also working with the government, which has been able to play a far-reaching role in changing the mentality of farmers in terms of breeding practices. AI makes the breeding easy and cost- effective for genetic improvement of indigenous cattle. Various crossbreds or graded cattle genotypes are getting more popularity among farmers for better meat and milk production. However, due to the lack of appropriate breeds, suitable breeding policy, and lack of improved knowledge most farmers are unable to take advantage of the opportunity. Taking into consideration the aforementioned information, this survey work was taken to assess the current scenario of cattle breeding practices in Netrokona district, Bangladesh and to explore the influential factors regarding cattle breeding.

Materials and Methods

Study area and selection of farmers

The study was carried out Netrokona district, Bangladesh from June to September in 2020. The data were collected randomly from different farmers of Netrokona district. A total of 80 farmers (8 farmers from 10 upazilla) were surveyed and all of them are currently engaged in cattle farming. In this survey work, 80 farmers were selected randomly from Atpara, Durgapur, Madan, Kendua, Mohongonj, Kolmakanda, Barhatta, Kaliajuri, Netrokona Sadar, and Purbodhola upazillas of Netrokona District.

Preparation of the survey schedule:

The survey schedule was designed keeping the objective of the research project in consideration. The substance and appropriateness of the survey schedule were assessed. Furthermore, a final timetable was established and the questions were arranged logically to facilitate easy response by the participants.

Method of data collection:

The preparation of the final questionnaire was followed by the completion of the entire

survey. Prior to the actual interview, the respondents were given an explanation of the study's goal and purpose, which helped them to feel more comfortable and open up throughout the conversation. After then, the questions were posed very simply, with explanations offered where needed. Data were gathered in local units and then transformed into the proper standard units in order to reduce mistakes. However, the farmers had no written information's (records) about their livestock. Consequently, the method of collecting desired information relied on the respondent's memory.

Statistical analysis:
Following the completion of the pre-tabulation activity, the gathered data were imported into Excel sheets, checked for normality, and any anomalous data were removed. Subsequently, the information was categorized, assembled, totaled, and examined in compliance with the research goals. Frequency and percentage of the descriptive statistics were performed using SPSS 11.5.

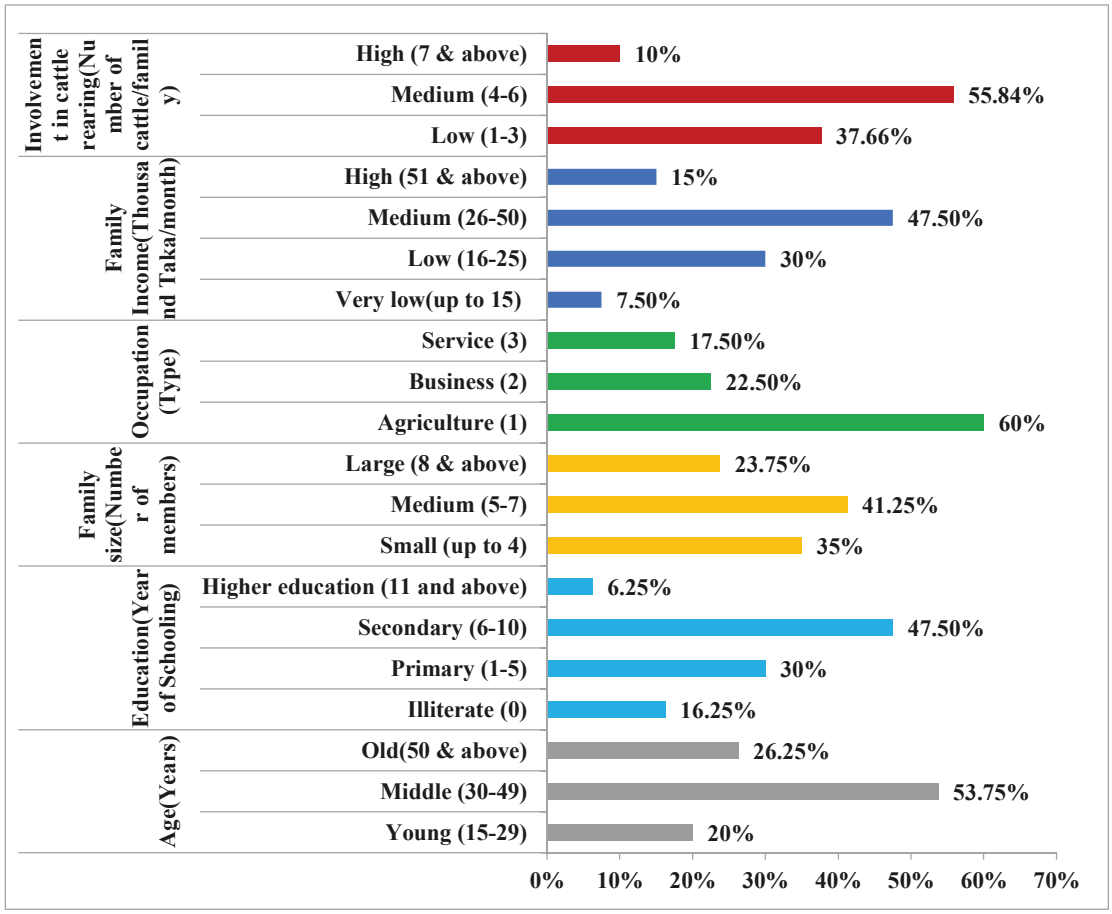
Results and Discussion

Socio-economic status of the respondent farmers with categories:
The respondent's age, education level, family size, occupation, income, and family members engaged in cattle rearing are shown in Figure-1. The maximum respondents (53.75%) of the study were middle- aged ranging from 30-49 years of age (Figure-2), which is similar to the findings of Karim *et al.* (2020) where they reported the highest proportion (56.7%) of cattle farmers were in middle-aged ranged from 25-60 years of old. Talukder *et al.* (2017) stated that, in case of dairy farmers 42 was the average age of the maximum responders, and each home included 7 family members. The results of this study also coincide with Rahman *et al.* (2012) where they reported that 45.3%, 38.7%, and 16.0% farmers were middle- aged, old-aged, and young-aged category, respectively. From the present survey, it was observed that the younger farmers are more technically efficient to adopt easily new technologies for increasing their efficiency and income compared to those older ones. Educated people are more conscious about ideal farming and efficient livestock breeding. From this survey findings, it is found that the education level of the farmers was 47.5%, 30%, 16.25%, and 6.25% for secondary school (class 6-10), primary (1-5), illiterate (0), and higher education (11 and above), respectively. This study strongly supports Islam *et al.* (2016), who found that the education levels of the farmers were SSC (24.30%), H.S.C (56.10%), and B.A. and M.A. (19.60%), respectively.

From the study, it was found that, the size of most farming family (41.25%) is medium size (5-7 members). Talukder *et al.* (2017) stated that age, literacy, and family size might have important impact in decision making for livestock farming.

From the survey it was found that, the farmers were associated with three types of occupation such as agriculture, business, and service. In the surveyed area, 60% farmers are directly related with agriculture as primary occupation followed by business (22.50%) and service (17.50%). Hossain M M (2020) reported that, 33.3% farmers were involved in cattle fattening as primary occupation and 67.3% were involved in cattle fattening as a secondary occupation.

Figure 1: Socio-economic status of the respondent farmers (N=80) with categories in Netrokona district, Bangladesh



The income of most farming family (47.5%) is medium (26-30 thousand per month). Talukder *et al.* (2017) found that the average yearly income of the farmers was Taka 83 thousands. The farmers were engaged in livestock production as a source of extra income. It was obtained from this survey work that, the majority of farmers had a medium (4-6) number of cattle per family, while 10% farmers raised a large number of cattle (7 and above) and 37.66% had a small number of cattle (1-3). Huque (2014) from a study found that, in Bangladesh average number of dairy cows per household varied from 1.75 to 2.47. In Trisal, Gouripur, and Mymensingh Sadar upazilla, respectively, the average number of indigenous cattle per household was 3.03, 3.49, and 3.1, according to a finding by Islam and Islam M A and Oliuzzaman (1992), which is relatively close to the current study.

Frequency of livestock distribution pattern:

Livestock distribution pattern in Netrokona district is shown in Table 1. Dairy cows accounted for the largest percentage of farmers (42.57%), with dairy calves covering in second (21.84%), beef bulls (11.71%), beef calves (8.20%), dairy bulls

(6.65%), beef cows (6.65%), and others (2.73%) in that sequence. According to Banglapedia (2015) it was found that, around 23.4 million cattle were thought to be in Bangladesh, of which 11.91 million were male and 11.49 million were female. Among these, 3.53 million were milking cows, 2.61 million were dry cows (cows without milk), 2.13 million were draught cattle, and 4.20 million were improved cattle, These survey findings revealed that most farmers prefer dairy farming over beef production because of their consistent financial support and daily supply of milk for families.

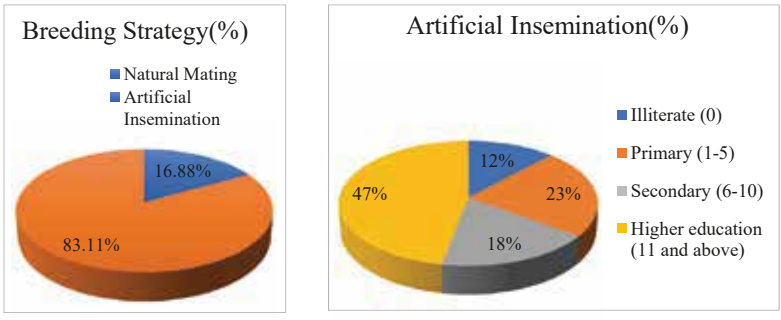
Table 1: Frequency of livestock distribution pattern in Netrokona district, Bangladesh.

Category of cattle	Number of respondents involved in rearing	Frequency	Percentage (%)
Dairy cows	55	109	42.57%
Dairy bulls	9	17	6.65%
Beef cows	8	17	6.65%
Beef bulls	13	30	11.71%
Dairy calves	21	55	21.84%
Beef calves	8	21	8.20%
Others	3	07	2.73%

Breeding strategy followed by respondent in Netrokona district, Bangladesh:

A total of 16.88% of farmers practiced natural mating by bulls and 83.11% followed artificial insemination (AI) to breed their cows (Fig-2). The percentage of AI is steadily increasing in all over the country. According to Hafez (1980) it was noted that, the most significant method yet developed for the genetic enhancement of animals is artificial insemination (AI). According to Haque *et al.* (2003)'s assessment, AI was first applied in Bangladesh in 1959 when liquid semen from high-yielding breeds was used for cattle development. The AI approach has been use in Bangladesh for about fifty years, and the program is being extended regularly. Presently, crossbred cattle population has been increasing gradually with the spread of AI. About 47% AI were practiced by higher educated people and respectively 23% by primary educated, 18% by secondary and 12% by illiterate people (Fig-2). This indicates that educated people were more interested in adopting new assisted reproductive technology (ART) like AI.

Figure 2: Breeding strategy followed by respondent at Netrokona district in Bangladesh



Availability of cattle breeding service in Netrokona district, Bangladesh:
Most farmers (62.50%) used their own bulls for natural mating system. Three quarters of farmers (75%) opined that AI support is easy, while a quarter of farmers (25%) expressed the difficulties of AI (Table-2). From a survey by Chupin and Schuh (1993), it was noticed that, AI is frequently used for cattle in developed countries, mostly for dairy cattle. Numerous initiatives to construct AI services have been introduced in practically all developing countries. According to statistics from Bonadonna and Succi (1980), just 17% of all AI applications were conducted in countries that were developing, with 41% occurring in developed countries and 42% in Eastern European nations.

Table 2: Availability of breeding service in Netrokona district, Bangladesh

Natural Services					Artificial insemination	
	Own Bulls	Bulls Within 1 km	Bulls within (1-3) km	More than 3 km	Easy	Difficult
Frequency	10	2	1	**3**	**48**	**16**
Percentage (%)	62.50%	12.5%	6.25%	18.75%	75%	25%

Distribution of livestock genotypes at Netrokona district, Bangladesh:
The majority of the farmers preferred crossbreed cattle (72.73%) for their higher productivity, whereas the remaining farmers had 27.27% indigenous cattle. Quddus *et al.* (2010) stated that native cattle were preferred over crossbred cattle because of their greater adaptability to local environmental stresses, ease of rearing, low input requirements, less susceptible to disease, and availability of native bulls for mating. Crossbred cattle farming was profitable, but native cattle farming was not. Hamid *et al.* (2016) stated that there are about 24.5 million cattle available throughout the country. The cattle are mostly indigenous, comprising the Red Chittagong, Pabna, North Bengal Grey, and Munsigonj breeds, accounting for around 85% of the total. According to Ahmed and Islam (1987), most cattle in Bangladesh are indigenous types, or non-descriptive variants that do not fit into any specific breed. It has been clearly observed from these survey findings that, crossbred cattle have been gradually increasing in the survey areas to obtain more milk and beef compared to local cattle.

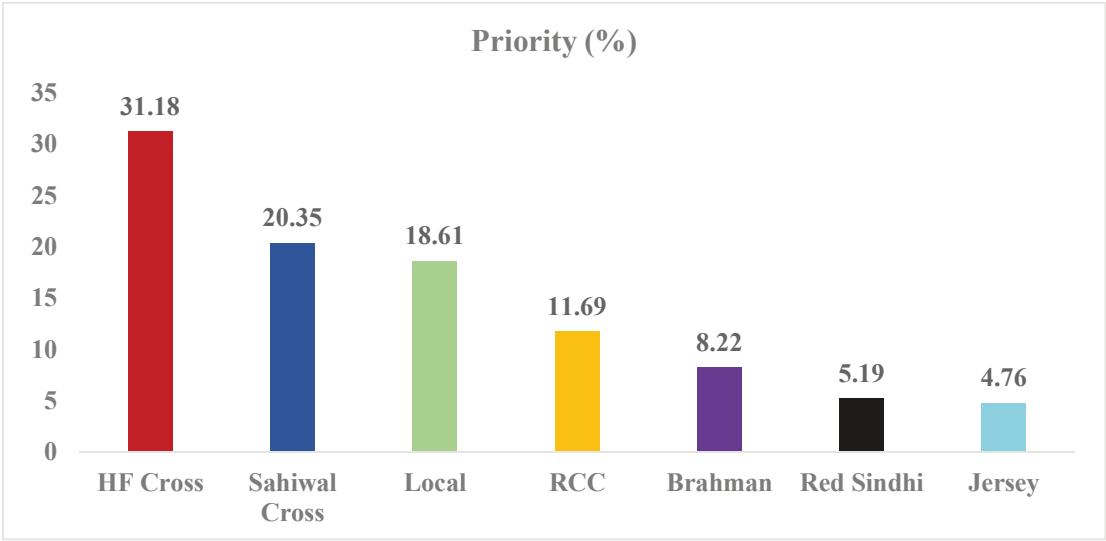
Table 3: Distribution of various cattle genotypes in Netrokona district, Bangladesh

Cattle genotypes	Frequency	Percentage (%)
Indigenous breeds	21	27.27%
Crossbred cattle	56	72.73%
Pure or exotic breeds	0	0%

Priority of breeding bulls during breeding practices in Netrokona district, in Bangladesh:

From the survey it was found that, maximum farmers (31.18%) prefer crossbreed as their first choice for higher milk production followed by good quality calf. Only 18.61% farmer prefer local breed having low productivity (Fig-3). Begum *et al.* (2017) found that, in Bangladesh, there are native improved variations such as Pabna cattle, Red Chittagong, Munshiganj cattle, North Bengal Grey cattle, and introduced foreign breeds including Holstein-Friesian, Jersey, Sahiwal, Hariana, Sindhi, Australian, and Sahiwal-Friesian. Kamal *et al.* (2010) stated that, the national population consists of 24.5 million cattle, of which 90% are of indigenous origin and 10% are crossbred. According to Khan *et al.* (1998), the majority of cattle in Bangladesh are of the native breed (*Bos indicus*); however there are also a small number of crossbreds and pure dairy cross animals like Shahiwal, Sindhi, and Holstein Friesian. Begum et al. (2018) from a study found that, farmers raised Jersey crossbred cattle (14.29%), Holstein-Friesian (38.87%), Deshi (68.11%), and Shahiwal (14.29%) animals and the majority of farmers (69.77%) used artificial insemination (AI) to inseminate their cows.

Figure 3: Priority of breeding bulls during breeding practices in Netrokona district.



Conclusion

This study's findings revealed that most of the farmers in Netrokona district are middle-aged (30-49 years) ranging from 30 to 49 years of old and crossbred cattle were getting more popularity among the farmers instead of indigenous cattle. Most farmers practiced AI in cattle breeding and educated farmers were more enthusiastic about AI. On the other hand, in case of natural mating maximum farmers use own bull. The study also revealed that, HF crossbred cattle is the more popular breed among the farmers than the other breeds. It also be concluded that appropriate application of AI would be the best way for efficient cattle breeding tool in Bangladesh.

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