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Indigenous beef cattle production scenario in Bangladesh

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Abstract

The study was carried out with the interest of investigate the beef cattle production system. A baseline survey was conducted on beef cattle production in Bangladesh from two districts of each division. The study was conducted to up-date knowledge on the state of beef fatteners in their own environment. The findings of the baseline survey revealed that major beef fatteners (90%) in Rajshahi division started their cattle fattening using own money, followed by 50%, 40%, 50%, 40%, 50% and 55% in Dhaka, Khulna, Barishal, Chattogram, Sylhet and Rangpur, respectively. The average size (4.93) of livestock holding per farm in Barishal division was considerably higher than that of Dhaka (4.35), Khulna (4.71), Rajshahi (3.83), Chattogram (3.35), Sylhet (4.29) and Rangpur (3.69), respectively. In the study area, the average size (2.14, 2.63 and 2.77) of indigenous cattle per farm in the division of Khulna, Barishal and Rangpur, respectively was considerably lower than those (3.47, 3.27, 3.40 and 3.93) of Dhaka, Rajshahi, Chattogram and Sylhet division, respectively. The average duration (18.6 month) of the fattening program was considerably higher in Dhaka division than that (11.6 month) of Rangpur division. Majority of the farmers followed semi-intensive feeding system. The amount of rice straw/h/d supplied to the beef cattle is remarkably lower (3.57 and 3.72 kg) in Rajshahi and Rangpur division than those (4.38, 4.57, 4.82, 4.32 and 4.32) in the division of Dhaka, Khulna, Barishal, Chattogram and Sylhet, respectively. The amount of concentrates supplied (817.86, 814.71 and 887.50 g) to their beef cattle in Barishal, Sylhet and Rangpur, respectively was considerably higher than those (758.82, 721.43, 772.22 and 739.71 g) of Dhaka, Khulna, Rajshahi and Chattogram division, respectively. In conclusion, there were differences in demographic information, source of capitals for fattening, herd size, duration of fattening, production system and feeding system among the divisions of Bangladesh.

Introduction

Livestock is an integral component of agricultural economy of Bangladesh performing multifarious functions such as provision of food, nutrition, income, savings, draft power, manure, transport, social and cultural functions. About 75% of the population rely to some degree on livestock for their livelihood specially the landless farmers (Tareque and Chowdhury, 2010). The contribution of the livestock sub-sector to GDP at constant prices was 2.50 percent in FY 2011-12. Though the share of the livestock sub-sector in GDP is small, it has immense contribution towards meeting the daily protein (animal protein) requirements (DLS, 2013 and MOF, 2013). According to the estimate of the Department of Livestock Services, the present population of cattle, goat, buffalo and poultry is about 23.24 million, 25.21 million, 1.4 million and 293.24 million, respectively in 2012-13 (DLS, 2013). Livestock Department's available statistics show that the domestic production of milk, meat and egg are 3.46, 2.33, and 7303 million tons in the fiscal year 2011-2012 against the demand of 13.50, 6.48, and 15392 million tons, respectively (GOB, 2011).It has been reported that in the Year 2007-08, it is evident that there is a deficit of (80%) in milk, 82% in meat and 63% in eggs in Bangladesh (FAO, 2008).Beef fattening in Bangladesh is one of the vital economical activities of farmer. Recently, cattle fattening practices has become very popular in Bangladesh to the small farmers (Hasan et el., 2022 & 2021; Hossain et al., 2016; Kamal et al., 2019; Kobir et al., 2022; Mustafa et al., 2020, 2021 & 2022). It's also a tool for livelihood improvement and income generation of rural poor (Rahman et al., 2012; Begum et al., 2007; Baset et al., 2003)

It was observed that most of the farmers adopt traditional beef fattening system for the cattle marketing during the Muslim festival "Eid-ul-Azha". Beef fattening is an emerging sector for employment and income generation of the rural poor, especially landless, destitute and divorced women. It is an effective tool for poverty alleviation of the rural poor. In recent years the female farmers of Bangladesh have been involved and sustained beef fattening program in rural areas of the country. Cattle live mostly on straw-based ration in Bangladesh. Nutrition is considered to be the major constraint to cattle production in Bangladesh (Baset et al., 2002; Rahman et al., 1997, 1998, 1999 & 2002; Quddus and Rahman 1998; Mazed et al., 2004; Islam et al., 2012; Khan et al.,

2004; Pharo, 1987). Straw is the important crop residue, contributes the major portion of the ruminant diet in the tropical and subtropical countries. In Bangladesh, out of the total 29.1 million tons roughages available for ruminants, rice straw contributes around 23.57 million tons (81%) and green grass only 1.6 million tons (Tareque, 1985). Saadullah and Hossain (2000) observed that the major feed stuffs for livestock are rice straw, green grasses from road side, scanty of rice bran, wheat bran, oil cake and kitchen wastes. They also reported that availability of rice straw ranges from 1.4 to 2.4 kg/cattle/day and concentrates ranges from 0.43 to 1.08 kg/cattle/day.The information available in the literature on cattle fattening by small farmers in rural areas are few and sporadic (Hossain, 1986; Huq et al.,1997 and Hashem et al.,1999). The present study shows the demographic profile of the beef fatteners and the indigenous beef cattle production scenario in Bangladesh.

Materials and Methods

A baseline survey was conducted on beef cattle production in Bangladesh from two districts of each division. High density of beef cattle and better response of the farmers were the basis for selection of the survey area. The results of the survey study indicate beef cattle management and production system. In the present study the baseline information was collected on various aspects of beef cattle management and production system from the mentioned areas. Keeping in view the objectives of the study, a questionnaire was prepared to collect the information.

Location of the study area

Bangladesh lies between 20.340 and 26.380 north latitude and 88.010 and 92.410 east longitude. It has an area of about 147570 sq. km. (BBS, 2002). Except the hilly region in the northeast, southeast and some areas of highland in the north and northwestern part, the country consist of low, flat, and fertile land. A network of rivers and their distributors cover the whole country (DLS, 2000). At the beginning beef concentrated areas of each division were identified and selected for data collection. The districts are Joypurhat and Dinajpur from Rajshahi division; Satkhira and Khulna from Khulna division; Noakhali and Chattogram from Chattogram division; Dhaka and Munshigong from Dhaka division; Moulavibazar and Sylhet from Sylhet division; Bhola and Barisal from Barisal division and Rangpur from Rangpur division.

Selection of the farmers

Data were collected from the farmers who reared at least one beef cattle and the butchers who slaughtered at least one cattle per week. Sample respondents were selected with stratified random sampling technique with arbitrary allocation. Owner of the indigenous cattle and butchers were selected from two districts of each division. The farmers and the butchers those were more cooperative and interested to provide reliable information voluntarily were interviewed. Several visits were made in the study areas and 20 (twenty) beef fatteners were randomly selected from each division. A total of 140 beef fatteners were selected for achieving objectives of the present study.

Preparation of questionnaire

To achieve the objectives a setof pre-tested questionnaire were constructed for traditional and seasonal fattener to collect data from farmers. Traditional fatteners are those farmers who raised fattened cattle as a component of a composite herd without any time limit and sell in the festival market.The survey was conducted from 1st December, 2011 to 28th February, 2012.

Variables related to beef fattening

Data on different inputs, such as, source and type of animals, feeds and forages, disease control and health management, housing management including labor, capital, season, period of fattening, output such as, type and system of management and marketing, traceability, and problems related to the system were collected through a set of questionnaires.

Methods of data collection

In order to obtain reliable information door to door survey was performed and data was collected through direct interviewing heads of the farmer families in Bengali. The information was collected by filling up the pretested questionnaire through interviewing with the fatteners in several districts of seven division over Bangladesh.

Data entry and analysis

After collection of data from the field, it was recorded in computer Microsoft Excel sheet. A number of tables and graphs were prepared on the basis of the purpose and goal of the study by using Microsoft Excel program.After that it was sorted according to the purpose of analysis.Finally, the tabulated data was analyzed by using SPSS 2016 computer program and Microsoft Excel program to deliver the results.

Results

Beef fatteners

Information on profile of beef fatteners, occupation, capital investment, cattle population and duration fattening, daily feed supply for fattening etc. are recorded in this study.

Demographic profile of beef fatteners

The family and its composition are related to occupation. Table 1 shows the demographic profile of the beef fatteners. In Dhaka division, the total family size (7.85) of beef fattener is higher than those (5.45) of Khulna division. The adult male (1.8), adult female (1.65), total male (4.2) and total female (3.65) of beef fatteners of Dhaka division show higher in number rather than those (1.65, 1.1, 3.05 and 2.4, respectively) of Khulna division. The Table 1 also shows the similar higher trend of total family size (7.4 and 7.45) in the division of Rajshahi and Sylhet, respectively. The adult male (2.0), adult female (1.8), total male (4.0) and total female (3.4) of beef fatteners of Rajshahi division are more or less similar to those (2.0, 1.8, 3.85 and 3.6, respectively) of Sylhet division. The

medium family size of beef fatteners is in Barishal (6.1), Chattogram (6.75) and Rangpur (6.35). However, considering among the areas, adult female (2.05) and total female (3.2) of Chattogram division is slightly higher than those (1.45, 1.85 and 2.75, 2.85, respectively) of Barishal and Rangpur division, respectively. It also may be noted that the other family composition eg. adult male (2.2) and total male (3.55) of Chattogram division shows similar in number to the composition (2.15, 2.0 and 3.35, 3.5, respectively) of Barishal and Rangpur division, respectively.

Table 1. Demographic profile of beef fatteners (n=140)

Division	Adult male (Mean±SD)	Adult female (Mean±SD)	Total male (Mean±SD)	Total female (Mean±SD)	Total family size (Mean±SD)
Dhaka	1.8±0.62	1.65±0.88	4.2±1.77	3.65±1.95	7.85±3.45
Khulna	1.65±0.67	1.1±0.31	3.05±1.19	2.4±0.68	5.45±1.10
Rajshahi	2±0.65	1.8±0.52	4±1.45	3.4±1.67	7.4±2.66
Barisal	2.15±1.14	1.45±0.51	3.35±1.63	2.75±0.79	6.1±1.83
Chattogram	2.2±0.77	2.05±0.51	3.55±1.00	3.2±0.70	6.75±1.29
Sylhet	2±0.79	1.8±0.70	3.85±1.53	3.6±1.27	7.45±2.52
Rangpur	2±0.92	1.85±0.75	3.5±1.31	2.85±1.27	6.35±1.90
Total	**1.97±0.81**	**1.67±0.67**	**3.64±1.45**	**3.12±1.32**	**6.76±2.33**

Occupation

Rural farmers in Bangladesh practice mixed farming. Irrespective of the size of holding, the overwhelming majority of the sample farmers had agriculture and fattening farming as principal occupation (figure .1) in all divisions. Farming here included agriculture and fattening, only cattle and goat fattening; and business and fattening.

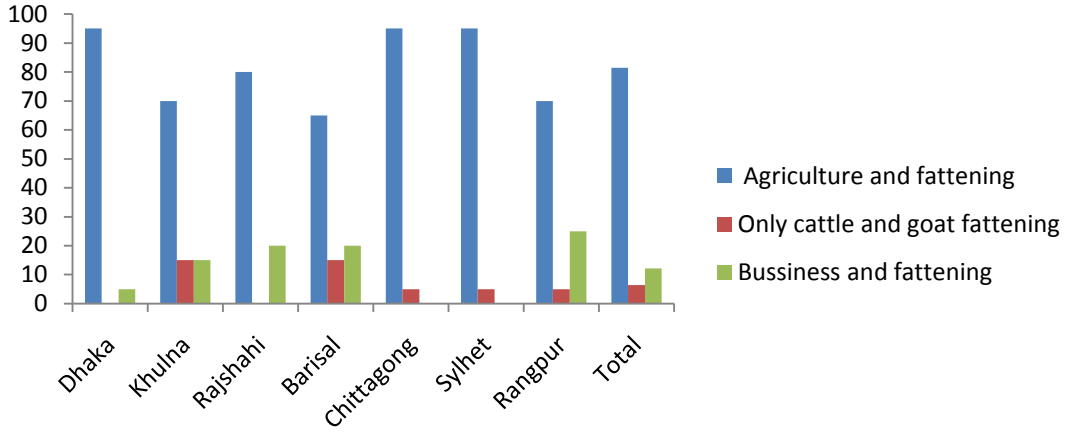

Figure 1 Household occupational profile.

Capital investment

It has been shown in Table 2 that majority (90%) of the beef fatteners in Rajshahi division started their cattle fattening business using own money, followed by 50%, 40%, 50%, 40%, 50% and 55% in Dhaka, Khulna, Barishal, Chattogram, Sylhet and Rangpur, respectively. Only 30% of beef fatteners in Sylhet and Rangpur division lent money from other sources for cattle fattening business followed by only 20%, 15%, 10%, 15% and 25% beef fatteners in the division of Dhaka, Khulna, Rajshahi, Barishal and Chattogram, respectively. Only 35% of the beef fatteners of Rajshahi and Chattogram division started fattening business using loan from NGO, followed by 10%, 30%, 20% and 10% of farmers in the division of Dhaka, Barishal, Sylhet and Rangpur, respectively. Only 20% beef fatteners of Dhaka division used bank loan for starting fattening business while very minimal number of beef fatteners eg. 10%, 5% and 5% used bank loan in the division of Khulna, Barishal and Rangpur, respectively.

Table 2. Distribution of respondents on the basis of capital investment (n=140)

Parameters	Dhaka	Khulna	Rajshahi	Barisal	Chattogram	Sylhet	Rangpur	Total
Own money used as capital (% and number)	50.00 (10)	40.00 (8)	90.00 (18)	50.00 (10)	40.00 (8)	50.00 (10)	55.00 (11)	53.57 (75)
Bank loan (% and number)	20.00 (4)	10.00 (2)	0.00 (0)	5.00 (1)	0.00 (0)	0.00 (0)	5.00 (1)	5.71 (8)
Loan from NGO (% and number)	10.00 (2)	35.00 (7)	0.00 (0)	30.00 (6)	35.00 (7)	20.00 (4)	10.00 (2)	20.00 (28)
Lending from other sources (% and number)	20.00 (4)	15.00 (3)	10.00 (2)	15.00 (3)	25.00 (5)	30.00 (6)	30.00 (6)	20.71 (29)
Total (% and number)	**100.00(20)**	**100.00(20)**	**100.00 (20)**	**100.00 (20)**	**100.00 (20)**	**100.00 (20)**	**100.00 (20)**	**100.00 (140)**

Cattle population and duration of fattening program

Farmers' possession of livestock for fattening and duration of the program were presented in Table 3 The average size (4.93) of livestock holding per farm in Barishal division was considerably higher than that of Dhaka (4.35), Khulna (4.71), Rajshahi (3.83), Chattogram (3.35), Sylhet (4.29) and Rangpur (3.69), respectively. In case of own cattle for fattening, the average size (2.64) of livestock holding per farm was in Barishal and Rajshahi division was slightly higher than that of Dhaka (2.0), Khulna (2.31), Chattogram (1.31), Sylhet (1.6) and Rangpur (1.57), respectively. However, in case of cattle purchased for fattening, the average size of livestock holding per farm was almost similar except Rajshahi (3.33) and Rangpur (3.2) division, respectively. This variation might be due to regional variation or have the greater ability to rear livestock compared to other division. In the study area, the average size (2.14, 2.63 and 2.77) of indigenous cattle per farm in the division of Khulna, Barishal and Rangpur, respectively was considerably lower than those (3.47, 3.27, 3.40 and 3.93) of Dhaka, Rajshahi, Chattogram and Sylhet division, respectively. Average age (0.90 year) of the indigenous cattle of Dhaka division is considerably lower than those (2.1 and 2.0, year) of Chattogram and Sylhet, respectively. In other division, the age of indigenous cattle was almost similar. There is usually a positive relationship between age and weight of livestock. Similar trend is also observed in Table 3 that weight of indigenous cattle was increased with advances of age in the study area. The average size (3.92 and 3.69) of the cross bred cattle holding per farm in Khulna and Barishal division was considerable higher than those (2.75, 2.50, 2.0, 2.80 and 2.88) in the division of Dhaka, Rajshahi, Chattogram, Sylhet and Rangpur, respectively. In case of age and weight of the cross cattle, similar trend was observed same as observed in indigenous cattle in the study area. The average duration (18.6 month) of the fattening program was considerably higher in Dhaka division than that (11.6 month) of Rangpur division. This duration of fattening program in other division was almost similar (Table 3).

Table 3. Farmers' possession of cattle for fattening and duration of the program (n=140)

Parameters	Dhaka	Khulna	Rajshahi	Barisal	Chattogram	Sylhet	Rangpur	Total
No of own cattle for fattening (Mean±SD)	2±0.79	2.31±0.79	2.64±1.20	2.64±0.84	1.31±0.63	1.6±0.74	1.57±0.79	2.02±0.94
No of cattle purchased for fattening (Mean±SD)	2.35±1.17	2.57±1.41	3.33±1.72	2.46±1.05	2.86±0.86	2.88±0.99	3.2±1.01	2.79±1.39
Total no of cattle for fattening (Mean±SD)	4.35±1.37	4.71±1.09	3.83±1.82	4.93±1.59	3.35±1.37	4.29±1.16	3.69±1.40	4.13±1.60
No of indigenous cattle for fattening (Mean±SD)	3.47±1.55	2.14±1.07	3.27±2.05	2.63±0.92	3.40±1.45	3.93±1.33	2.77±1.48	3.17±1.61
Age of indigenous cattle, year (Mean± SD)	0.90±0.31	1.61±0.70	1.06±0.50	1.34±0.42	2.1±0.83	2.00±0.96	1.96±0.88	1.57±0.84
Weight of indigenous cattle, kg (Mean± SD)	55.33±12.02	65±11.90	60±9.64	68.75±16.64	87±16.88	80.00±24.27	85.00±22.73	72.10±20.85
No of cross cattle for fattening (Mean± SD)	2.75±1.16	3.92±2.02	2.5±1.07	3.69±1.65	2.00±1.00	2.8±1.30	2.88±1.64	3.17±1.61
Age of cross cattle, year (Mean± SD)	1.6±0.49	1.79±0.68	0.91±0.44	1.40±0.70	1.5±0.87	1.55±0.57	1.44±0.78	1.47±0.67
Weight of cross cattle, kg (Mean± SD)	81.25±13.56	98.85±28.59	86.25±33.88	94.62±28.54	78.33±14.43	80±10.61	86.88±26.85	89.40±25.75
Duration of program, month (Mean± SD)	18.6±6.43	15.75±6.22	16.50±8.68	16.05±8.68	14.90±7.17	16.25±8.60	11.60±6.98	15.66±7.39

Category of cattle

The figure 2 shows that the ownership of beef cattle by the farmers highlighted two categories of animal e.g. indigenous cattle and cross bred cattle. The higher number of indigenous cattle is fattened in the study area compared to cross cattle indicates that the indigenous cattle need comparative lower amount of feed, resistant to diseases and high demand in market.

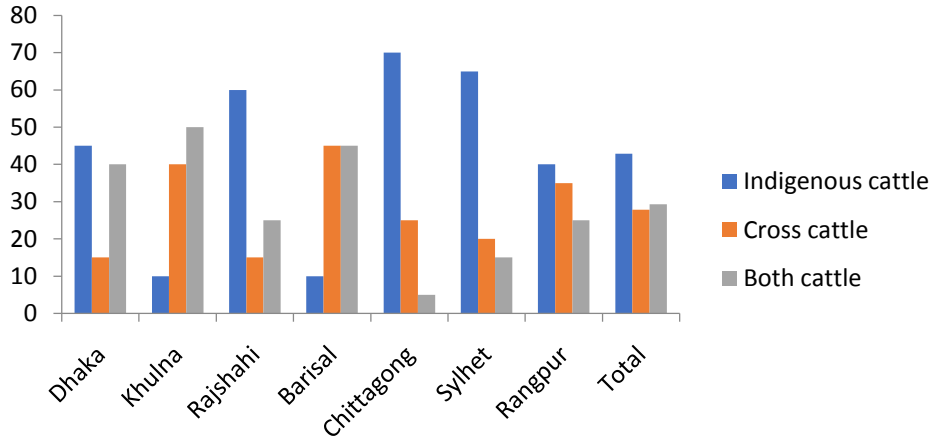

Figure 2. Category of cattle reared for fattening.

Feeding system

The Figure 3 shows that the beef cattle were kept under semi-intensive and intensive feeding system. Majority of the farmers followed semi-intensive feeding system. The indigenous cattle were allowed to graze on communal land and stall fed in the remaining period of the day. When the beef cattle were kept in stall, feeds were supplied *ad libitum*.

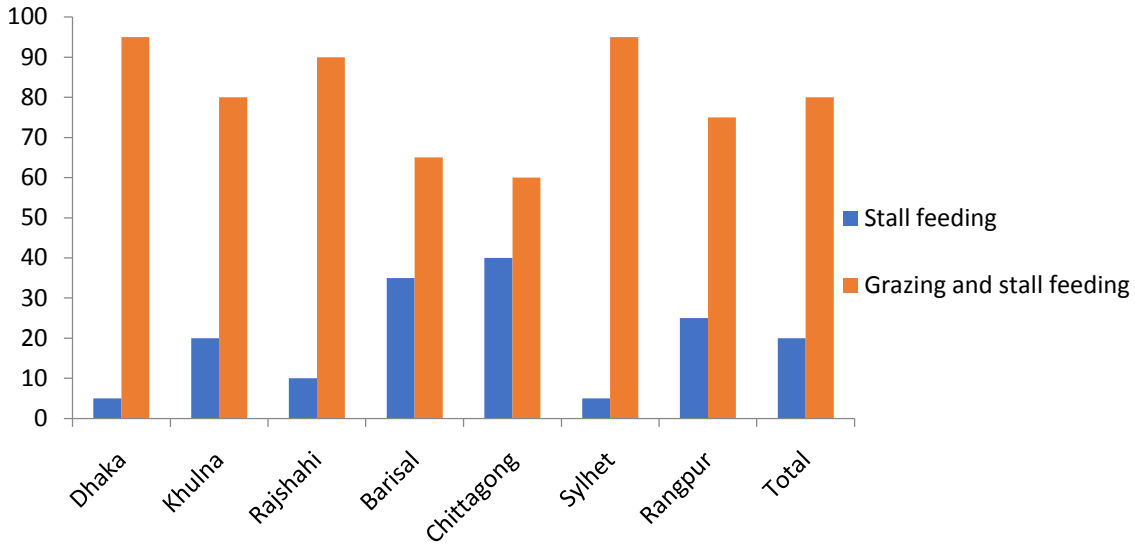

Figure 3. Feeding system of cattle for fattening.

Amount of feed supplied

Supply of feed to the beef cattle is shown inTable4. It appears that the feeding systems of beef cattle were based on roughage and concentrates. The amount of rice straw /h/d supplied to the beef cattle is remarkably lower (3.57 and 3.72 kg) in Rajshahi and Rangpur division than those (4.38, 4.57, 4.82, 4.32 and 4.32) in the division of Dhaka, Khulna, Barishal, Chattogram and Sylhet, respectively. The amount of green grass /h/d supplied to the beef cattle is remarkably higher (6.93) than those of other division. This might be due to availability of green grass in the hilly areas. It was also found that beef fatteners offered a variety of concentrates to their animal. The commonly used concentrate ingredients were wheat bran, rice bran, mustard oil cake and broken rice. The amount of concentrates supplied (817.86, 814.71 and 887.50 g) to their beef cattle in Barishal, Sylhet and Rangpur, respectively was considerably higher than those (758.82, 721.43, 772.22 and 739.71 g) of Dhaka, Khulna, Rajshahi and Chattogram division, respectively.

Table 4. Feed supplied (Mean±SE) to their cattle for fattening purpose (n=140)

Parameters	Dhaka	Khulna	Rajshahi	Barisal	Chattogram	Sylhet	Rangpur	Total
Rice straw (kg/h/d)	4.38±0.96	4.57±0.62	3.53±1.21	4.82±0.80	4.32±0.68	4.32±0.68	3.72±1.13	4.21±0.98
Green grass (kg/h/d)	3.73±1.61	3.67±1.63	3.32±1.31	2.95±1.27	6.93±1.27	3.29±1.25	4.91±1.58	3.93±1.77
Total roughage (kg/h/d)	7.68±2.05	7.71±2.09	6.67±0.91	7.14±1.52	7.18±3.48	5.68±1.69	7.09±2.56	7.00±2.22
Wheat bran (g/h/d)	243.75±109.35	272.22±141.67	355.88±95.00	228.57±95.12	200±63.74	256.25±72.74	276.92±72.50	264.21±102.03
Rice bran (g/h/d)	325.00±112.55	266.67±124.92	210.71±112.96	350.00±83.21	238.24±62.57	285.29±99.63	303.13±93.93	283.02±105.98
Mustard oil cake(g/h/d)	135.71±53.45	175.00±94.15	229.41±110.48	126.92±33.01	141.18±53.72	108.82±36.38	153.13±49.90	153.30±75.68
Broken rice (g/h/d)	158.33±70.17	213.64±74.47	200.00±70.71	253.85±106.97	189.06±77.98	190.63±58.36	206.25±75.00	201.40±79.63
Total concentrates (g/h/d)	758.82±166.05	721.43±97.50	772.22±134.19	817.86±147.55	739.71±104.98	814.71±134.36	887.50±59.16	787.39±132.80
Salt (g/h/d)	104.71±27.36	113.93±24.74	105.56±24.91	95.36±11.84	92.35±12.76	100.29±16.25	92.50±19.49	100.58±21.26

Conclusions

The study revealed that rural farmers in Bangladesh practice mixed farming. Most of the farmers started their business by their own capital and a few used bank loan. It may be concluded that most (100%) of the beef fatteners used existing housing facility. The feeding systems of beef cattle were mostly semi-intensive and based on roughage and concentrates.

Conflicts of Interest

The authors declare no potential conflict of interest.

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