



Livelihood improvement of poor farmers through beef fattening of Sirajganj district in Bangladesh

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ABSTRACT

The experiment was conducted to evaluate the feeding, management, income generation, livelihood improvement, credit received and its realization by beef fattening in Sirajganj district of Bangladesh. The experiment was conducted at Khokshabari union in Sirajganj district. A total 15 respondents were randomly selected from three villages purposively where 5 from each village. Both descriptive and inferential statistics were used to analyze data. The period of data collection was 4 months of normal season and 6 months before Eid -ul -Azha in 2014. The experiment was divided into two cycle like 1st and 2nd cycle, respectively. The farmers were treated as hard core poor, poor and illiterate. Crude protein (CP) contents of available feedstuffs were compared higher and crude fiber (CF) content was lower compared to other unconventional feedstuffs indicated the availability of good quality feeds for fattening cattle in studied areas. Total cost of production, gross return and net return per household beef fattening of 1st cycle was 22010, 39028 and 17017 BDT and 2nd cycle was 33360, 61591 and 28231 BDT, and loan recovery rate was 95- 100%, respectively. Food purchasing, cloth purchasing, social status, health care, educational and housing status were increased at 33, 30, 24, 17, 14 and 12% through beef fattening in study area and loan realization trends was better than that of other organizations. The results clearly indicate that drastic livelihood improvement of poor farmers, creation of self- employment and better loan realization through beef fattening practices was possible in the study areas by improved scientific management practices.

INTRODUCTION

Milk, meat and eggs are main protein source for people of Bangladesh. Cattle have significant role on contribution to GDP through production of meat and hides. Beef cattle enterprises have a great prospect in Bangladesh (Begum et al., 2007). Not only during Eid-ul-Azha but also it has a great demand round the year. According to the department of livestock services (DLS, 2017) there were some 60 lacs healthy cattle including buffaloes in Bangladesh, against the demand of an estimated 70 lacs during Eid-ul- Azha. Most of farmers (71.5%) reared native male cattle <2.0 years of age on purchasing from local market (Huq and Amanullah, 2009). Roy et al., (2009) found that 25% of the population in Bangladesh is engaged directly and 50% indirectly to livestock related activities. Beef fattening is economically suited for rural hard core poor and poor people. It

is heritable profession from their ancestor beginning the civilization of the world. They are usually maintained on tree leaves, shrubs, Napier grass, bushes, low cost concentrate and urea-molasses treated straw in rural condition. Average share of feed cost was 27% of total cost of cattle fattening. Rest comprised 61, 6.0, 2.0 and 4.0 % for animal procurement, labor, housing and health management, respectively (Roy et al., 2009). Hague and Sultana (2007) found that average ratio of roughage and concentrate (mostly of bran and oilcakes) in the diet fed to native cattle in Bangladesh was 78.4:21.6, and minimum ratio of the same for feedlot diet was 30:70. Roughage of the later consisted mostly of silage or good quality hay and concentrate was mostly dominated by grains. Beef cattle are docile in nature and ease to handle, manage and preferred by rural women as a domestic animal to keep and conservation as their ancestor profession.

In Bangladesh, about 45% people live below poverty line (BBS, 2014). Cattle fattening enterprise is a profitable and effective option for poor in Bangladesh. However, still challenges are remaining for the involvement of extreme poor in general. Cattle have an important role as national income also important creating employment opportunities of hard core poor and poor people. Poor people can earn a lot of money to improve their standard of living by beef fattening. The coordinated efforts of government organization, NGOs and private sectors including micro-finance institutions could address the challenges. In addition possible linkage to export market of meat to the Middle East or other countries could be explored. Private- Public Partnership (PPP) could be right approach to go further to promote and strengthen value chain. This intervention could be extended in other South Asian countries. DLS address to the problems of poor in poverty reduction. It is remarkable that cattle fattening brings quick benefit. Government and NGOs are providing micro credit; training and technical support to rural farmers to increase the production of fattening cattle. Government of Bangladesh has started a national program on poverty alleviation, self-employment, food supply and increase of hides and skin exportation through livestock rearing.

A few works have been done about livelihood change of poor farmers by beef fattening in Bangladesh. So, the work has been done to measure the livelihood changes of beef cattle keepers. Talking this point into consideration, the present experiment was conducted to investigate the socio-economic status, income generation, livelihood changes and increasing capacity of loan recovery of poor beef cattle keepers in studied areas of Sirajganj district. So, the study was taken to investigate the feeding, management, income generation, estimate of livelihood changes of beef fattening poor farmers and to show the percentage of loan recovery rate.

MATERIALS AND METHODS

Selection of study villages

Three villages from one union named Khokshabari in Sirajganj district were selected for this study.

District, upazila, union village and respondents' numbers in study areas are shown in Table 1. The villages were based on poor human resource and available green fodder and straw with 1-2 cattle reared per household. Khokshabari union is located at 6 km north from Sirajganj district town. This area is very much suitable for beef fattening activities to the improvement of livelihood of poor farmers.

Table 1

District, upazila, union village and respondents' number in study areas.

District	Upazila	union	village	No. of farmers
Surajganj	Dadar	Khoksha bari	Sailabari,	05
			Munsumi,	05
			Khokshabari Uttor para	05
Total	01	01	03	15

Selection of respondents

Five respondents were randomly chosen from each village. Total 15 respondents were chosen of data collection to serve the purpose of research objectives. The respondents were classified into three village group such as Sailasbari, Munsumi and Khokshabari Uttor Para in same union.

Preparation of interview schedule

The interview schedule was carefully prepared based on objectives of the study. A draft schedule was developed before preparing the final schedule. The draft schedule was then pre- tested with selected farmers in area and then it was rearranged and modified as required of study. The schedule was developed so simple manner to avoid misunderstanding and to get accurate information from respondents of research area. Then it was finalized according to the experience gathered in primarily field level survey.

Data collection

The researcher collected all information through personal interview from individual respondent in their own house. An introductory visit was made

to study area when the aims and objects of study were explained to the most of the respondents. This helped to create a friendly atmosphere of respondents. Brief information regarding the nature and purpose of study was made to the respondents before actual interview. The researcher also established desired rapport building systematically and explained whenever it was felt necessary. The information supplied by respondents was recorded directly on the interview schedule. The information was cross checked carefully before leaving study area to avoid errors. Data was collected in local unit. These were subsequently converted into desirable standard level unit. The respondents were interviewed at their house so they could give proper information without any hesitation. Excellent cooperation was received from all respondents during data collection period. Data were collected during January to October, 2014. The selected variables in this study were educational status, occupational status, socio-economic status, livestock status, feeding, housing condition, disease and health care, routine activities of farmers for beef cattle rearing, annual cost of production, income, and impact of income for improvement livelihood of poor farmers.

Daily routine works of farmers for beef fattening

Beef cattle were kept inside the house without any excess loss of energy. The house was cleaned every morning. They were never taken outside the house. Beef cattle were supplied with pure drinking water. All tube wells were done arsenic test by the technician of the Department of Public Health and Engineering (DPHE). All test cost was paid by Social Development Foundation (SDF). Some supplements were fed in the morning. Animals were bath daily with fresh water using body brush. Regular combing was done twice daily, As a result external parasites and dust would be removed. Green grass, fodders, rice straw, protein concentrates were fed as routine wise of animals.

Roughage and concentrate feed ratio

The ratio of supplied ration in the studied area was 33.3:66.7 in which roadside green grass, cultivated

fodder and tree leaves are mainly treated as roughage and concentrate was mainly dominated by sesame oilcake.

Chemical analysis of feeds and fodder

Proximate composition of locally available feeds and fodder were done to investigate crude protein (CP), Crude fiber (CF), ether extracts (EE), and nitrogen free extracts (NFE) and ash. The analysis was done in Animal Science Laboratory of BAU according to the method of AOAC (2004).

Production cycle of beef fattening

Production cycle was divided into two: 1) First cycle was practiced of four months for normal season and sold the animals to the buyer for legal prices. 2) Second cycle was practiced of 5 months before Eid-ul-Azha and sold the animals to individual buyer and real whole seller to ensure high price of cattle.

Loan taken and repayment of installment

All respondents were received loan from Gram Samity (GS) Office of SDF. Interest percentage was 10%. The repayment installment was 50 per year with principal amount and interest. All respondent paid their installment weekly basis. Farmers paid their savings money to GS office weekly basis at the amount of Tk.20-50 for their future protection.

Data analysis

After completion of field survey all interview schedules were set for its data tabulation for coding and reduction. All individual variables of interview schedules were transferred to master sheet to facilitate tabulation. Data were analyzed by descriptive statistics such as number, tabular, mean, percentage, standard deviation etc. The data was analyzed with the help of SPSS-v-16 computer package program.

RESULTS AND DISCUSSION

Socio- economic condition of respondents

The socio-economic of beef fattening farmers in Sirajgajn Sadar Upazila, include: age, educational status, occupation, training skill, source of capital, purchasing ability of farmers and rearing practice duration of beef cattle.

Status

The age, education and occupational status of beef fattening farmers are presented in Table 2. The beef cattle rearing were practiced by the middle (67%) and old aged (33%) farmers. More than 80% beef fattening farmers were educated but only 20% are illiterate only known to sign. Islam et al., (2012) reported that 46, 10.7 and 5% had primary, SSC and HSC level of education respectively. In study areas, 100 % of selected farmers were engaged only with beef cattle rearing.

Training skill and source of capital

Training skill and source of capital of beef fattening farmers (Table 2). All the farmers received training from SDF by district and regional livelihood officers. These findings agreed with Hossain et al., (2018). They have practiced beef fattening as their family profession. All the

farmers received loan to their GS office to purchase cattle and some used their own cattle for this program.

Purchasing ability and duration of rearing beef cattle

Most of farmers purchased 1-2 beef cattle in study area and during of beef cattle rearing was 4 -6 months. Loan recovery rate was 95-100% (Table 2.). The recovery rate of Grameen Bank was 97% (Mamun et al., 2002) which is in accordance with the present study.

Availability of feeds and fodders

Various types of feed ingredients were used in study areas for beef cattle. The common ingredients were roadside green grass wheat bran, rice bran and tree leaves. All farmers used sesame oil cake as protein source for fattening cattle. The farmers were mainly depended on green grasses and tree leaves because of their availability (Table 3). All farmers (100%) used fodders and tree leaves and 100% farmers reported that feeds are available in selected areas which are similar with the findings of Hossain et al., (2018).

Table 2

Status of fattening farmers and duration rearing beef cattle in studied areas.

parameter	Category	Frequency	Percent (%)
Age	Middle aged(30-40)	10	67
	Old aged (>40)	5	33
	Total	15	100
Education	Primary	10	67
	Bellow SSC	2	13
	Illiterate	3	20
	Total	15	100
Occupation	Beef cattle only	15	100
	Dairying only	0	0
	Total	15	100
Training skill	With training	15	100
Source of capital	Loan from SDF	15	100
Purchasing capacity	1 cattle	12	80
	2 cattle	03	20
	Total	15	100
Duration of rearing	4-5 month (1 st cycle)	15	100
	5-6 month (2 nd cycle)	15	100
	Total	15	100
Repayment rate	95-98%	12	80
	98-100%	3	20
	Total	15	100

Feeding system

All farmers were practiced intensive system in study areas. In this system is the advantage that there was no losses energy of animals (Table 3).

Table 3
Availability of feeds and fodders and feeding system in studied areas.

Types of feeds	Frequency	percent
Roadside grass(Durba, Helencha, Noll)	15	100
Cultivated fodders(Napier, Maize, Sugarcane top)	15	100
Tree leaves(Jackfruit, Banana, Shaora, Bamboo)	12	80
Sesame oilcake	15	100

Table 4
Chemical composition of feedstuffs in studied areas (% DM).

Name of feedstuffs	CP	CF	EE	NFE	Ash
Durba	15.8	22.6	4.4	46.5	10.7
Helencha	20.2	15.3	14.1	43.9	6.5
Noll grass	9.8	16.2	3.8	57.5	12.7
Napier	9.7	12.4	3.8	68.1	6.0
Miaze	11.5	16.4	10.6	49.5	12.0
Jackfruit	20.2	10.0	11.4	51.7	6.7
Sesame oilcake	22.7	11.9	26.9	31.0	7.5

Durba and Helencha were found higher compared to other unconventional grasses. CP content of feed stuffs in study areas is comparable and even higher than those of other unconventional fodder leaves and higher than the minimum range of NRC (National Research Council) for mature beef cattle (70g/kg) and high producing dairy cows (190g/kg). Taher et al. (2002) reported that DM and CP of rice straw and wheat bran were 910 & 890 and 121 & 131g/kg respectively. Pathol (1994) reported that DM and CP of sesame oil cake were 900 and 370g/kg. CF content of feed stuffs was lower indicated a good quality feed for fattening cattle. The presence of high CF in feeds is reported to decrease dry matter digestible in animals and therefore, provides a good indication of the nutritional value of feeds. The highest EE

content was recorded in Sesame oilcake and lowest was found in Noll grass and Napier grass (Table 4).

Major diseases of beef cattle

Four major diseases were found where the occurrences of FMD 60%, followed by Black quarter, Anthrax and Hemorrhagic septicemia (Table 5). Hossain et al., (2018) stated that Anthrax, Foot and mouth, Black quarter and Hemorrhagic septicemia were 100, 75, 83 and 67, respectively in their study.

Sources of vaccination and de-worming

In the study areas 100% farmers performed vaccination (Anthrax, FMD, BQ and HS) and de-worming tablets to their cattle like Endex (Novartis, Bangladesh and Levex (ACI Ltd Bangladesh) collected from local market (Table 5).

Table 5
Health care practices of fattening cattle in studied areas.

Name of diseases	Frequency	Percent
Anthrax	15	100
Foot and mouth (disease)	9	60
Black quarter	15	100
Hemorrhagic septicemia)	10	67
Total	15	100
Vaccination		
Yes	15	100
No	0	0
Total	15	100
De-worming		
Sources of vaccines and de-worming tablets		
Local market	5	33
Livestock office	10	67
Total	15	100

Cost of fattening cattle

Price of animals varies according to the size, color and utility. Price of one cattle for fattening purpose ranged from 13000- 25000 (1st cycle) and 23000- 42000 BDT (2nd cycle) in studied areas (Table 6).

To analyze the cost return, it is necessary to describe the feed cost, breeding cost, housing cost and equipment for cattle rearing. Cost per year of housing and equipment was more or less similar with feed cost. The major cost of healthcare is medicinal cost followed by vaccination program. Some Local Service Provider (LSP) of study areas done several programs on vaccination, deworming and treatment. All LSP were well trained by SDF as TOT on Para vet build up program and certificate holder. As a result it was very helpful to fattening farmers of these areas. Average rearing cost of one cattle was 2650 BDT (Table 7). Hossain et al., (2018) reported that rearing cost of dairy cattle was 13500 BDT which was higher than this study.

Table 6
Cost of one cattle in two cycles.

(1 st cycle)		
Cost per cattle(BDT)	Frequency	Percent
13000-17000	4	27
17000-20000	6	40
20000-25000	5	33
Total	15	100

(2 nd cycle)		
Cost per cattle(BDT)	Frequency	Percent
23000-28000	2	13
28000-30000	5	33
30000-42000	8	54
Total	15	100

Average cattle cost 30710 BDT

Table 7
Different cost of per fattening cattle in studied areas.

Category	Expenditure (BDT)
Average feed cost (4 month)	1500
Average housing and equipment cost(4 month)	600
Total	2100
Medicine and vaccine cost	
Average medicine cost (4 month)	200
Average vaccine cost (4 month)	350
Total healthcare cost	650
Total rearing cost	2650

Cost of farmers family members

Food cost was found highest among the total expenditure. The second highest expenditure was to maintain social status followed by the cost for clothing, education, healthcare, and housing (Table 8).

Table 8
Average expenditure (BDT) per farmer per 4 month in studied areas.

Category	Average expenditure	Minimum	Minimum
Food	2800	1200	3500
Cloth	350	140	500
House	145	125	240
Education	250	150	450
Healthcare	175	100	460
MSS	600	400	850

MSS, maintaining social status (decoration, gift, furniture, recreation, attend various festival, invitation etc.)

Total and net income from beef cattle rearing

Average income per cattle through fattening was 17017 (1st cycle) and 28231 BDT (2nd cycle) (Table 9). In India, net annual income from rearing one cross breed cow and one buffalo was Rs. 30784 per year (Kalash et al., 2009). The net income from one fattening cattle per cycle was 17017 BDT and 28231 BDT which was similar with this study indicated that rearing fattening cattle in studied areas was profitable.

The net income was higher in 2nd cycle than that of 1st cycle of fattening cattle rearing. Before Eid-ul-Azha there are huge demand of Muslim of cattle slaughtering for sacrifice to Allah. Farmers are well equipped by practicing of 2nd cycle cattle rearing and leaning mistaken from beef cattle rearing of 1st cycle and find legal market and sale their cattle to actual consumer avoiding market actors. They maintained strong linkage with well known market and consumers to by their cattle to ensure real price. Their mental strength were strong and well known to all rearing practicing, medication and well communicated to Upazila Livestock Office and other service providers. As a result they were more benefitted to 2nd cycle than that of 1st cycle fattening cattle rearing in studied areas.

Table 9
Total and net income from beef cattle rearing in studied areas.

Category	Income	Minimum(BDT)	Maximum(BDT)
Income/cattle/cycle	38478	23828	44011
Cow dung sale	38478	350	750
Total	39028	24178	44761
Total expenditure (1st cycle)	22011		
Total expenditure (2nd cycle)	33360		
Net income (1st cycle)	17017		
Net income (2nd cycle)	28231		

Livelihood improvement of fattening farmers

Beef cattle rearing increased livelihood status of farmers especially for the farm women and the development of this sector is the potential path to rural prosperity (Kalash et al., 2009).

Impact of purchase capacity

The food and cloth purchasing capacity of fattening farmers are presented in Table 10. Before

rearing fattening cattle, farmers spent only 2800 BDT for purchasing food but they were able to spend 4200 BDT after they have started rearing fattening cattle which was 33.33% more than the previous state which is agreed with the finding of Hossain et al., (2018). On the other hand, farmers spent only 350 for purchasing cloths but they were able to spend 500 BDT after they have started rearing fattening cattle, which was 30 % more than previous state. This result is more or less similar with the finding of Hossain et al., (2018).

Table 10
Impact of fattening cattle on livelihood activities in studied areas.

Category	Initial value(BDT)	Final value(BDT)	Percent	Ranking
Food purchasing	2800	4200	33.33	1
Cloth purchasing	350	500	30.00	2
Social status	600	790	24.05	3
Health care	175	210	16.66	4
Education	250	290	13.79	5
Housing	145	165	12.12	6

Impact of social status, education and healthcare

The impact on social status, education and healthcare are presented in table 11. Before rearing fattening cattle, farmers were able to spend only 600, 250 and 175 BDT to keep their social status, education and health care but they were able to spend 790, 290 and 210 BDT for maintaining their social status, education and healthcare after they have started rearing fattening cattle, which was 24.05, 13.79, and 16.66%, respectively more than previous state.

Impact on housing

Before rearing fattening cattle, farmers spent only 145 for their housing purpose but they were able to spend 165 BDT for their housing after they have started rearing beef cattle (Table 10), which was 12.12% more than the previous state indicated that beef fattening farmers are less interested to spend money for housing rather than other purposes.

CONCLUSIONS

It is revealed from the study that beef fattening is the best option of income generating activity for poor and hard core poor farmers for their livelihood improvement. The result indicated that drastic livelihood increased through the rearing of fattening cattle in studied areas. Considering all the parameters studied, fattening cattle program is

a profitable practices in the selected areas and improvement the socio- economic status and their livelihood of fattening cattle farmers was possible in the studied areas. The loan recovery rate was better than that of other microfinance institutions due to better income generation through applied good livestock management practices and improved scientific approaches and technology.

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