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Research Article

Fattening practices of beef cattle for quality meat production at Rangpur district of Bangladesh

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Abstract

The study was aimed to assess the ongoing beef cattle fattening practices at some selected areas of Rangpur district of Bangladesh. The survey was carried out through a structured questionnaire among 45 selected farmers during February to June, 2020. Parameters studied were the roughage and concentrate feeding practices, treatment of straw or green grass, ration formulation, introduction of steroids for fattening, cost return analysis of cattle fattening practices. It was found from the study that the respondents were About 55.55% farmers used own capital for fattening, while 33.33, 6.67 and 4.44% farmers got money from NGO, other people and bank loan respectively. Most of the farmers (44.44%) reared indigenous bulls compared to crossbred (24.44%) and mixture of both (31.11%). A significant number of farmers reared uncastrated bulls (88.89%) and nobody reared cows or heifers for fattening. Majority of the farmers' fattened cattle only before Eid-ul-Adha (57.78%) and only 24.48% farmer fattened cattle round the year and the rest of the farmers practiced seasonal fattening. Majority of the farmers supplied roadside grass (55.56%) as the source of forages compared to straw (17.78%) and cultivated fodder (26.67%). In case of concentrate feeding, only 20% farmers supplied commercial pellet feed, 35.56% supplied local hand mixed feed and 44.44% supplied both pellet and hand mix feed. Among the cattle fattened farmers only 5% farmers administered steroids as a growth promoter and 95% of them did not use any kinds of growth promoter at the period of fattening. Therefore, beef would be safe for human consumption without any health hazard.

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Introduction

Beef fattening is a promising sector for employment and income generation for the rural poor, especially landless, marginal and small farmers. It's an effective way to eradicate poverty from the rural poor. Cattle fattening for quality beef production has become more popular day by day to the small farmers in Bangladesh (Begum et al, 2007; Hasan et al., 2021). It's also a tool for livelihood improvement and income generation of rural poor (Baset et al., 2002 and 2003; Quddus and Rahman 1998; Rahman et al., 1997). Bangladesh is a low-lying densely populated country of more than 160 million people, 75% of them live in rural areas; of which 36% are extremely poor. Livestock are an integral component of agriculture in the study area and make multifaceted contributions to the growth and development in the agricultural sectors. The livestock industry in Bangladesh is mainly based on cattle, goat, sheep, buffalo, and poultry. A total of 375 million livestock animals in Bangladesh, including 24 million cattle, 25 million goats, 3 million sheep and 1.9 million buffalo where the chicken population is about 255.31 million (Hashem et al., 2020; Hossain et al., 2016). One of the advantages of the cattle fattening by the rural farmers is that they use locally available cattle feed resources during the Eid festival. Although the cattle population is too high, their productivity is too low due to poor genetic makeup, inadequate feed supply, lack of scientific knowledge in housing and management. Due to the above reason their growth performance is very poor. Planned beef cattle production system usually is not practiced in Bangladesh. The contribution of livestock plays an important role in the national income. Cattle provide us food in the form of milk and meat. They supply power in the form of ploughing, traction and add organic manures to the soil. Livestock resources necessarily encompass animal health care and welfare, quality production factors, and effective rearing to keep pace with expansion of entrepreneurship related to concerned industries. It plays an important role in the agricultural production sphere. About 6.5% of national GDP is covered by the livestock sector, and its annual rate of productivity is 9%. About 20% of the population of Bangladesh earns their livelihood through work associated with raising cattle and poultry.

The requirement of animal protein per head per day is 120 g whereas, the availability was only 12.51 g in Bangladesh in 2004 (DLS, 2004). But, meat production has increased through recent beef fattening activities and broiler farming and it was found that 7.51 million metric ton meat was produced in Bangladesh in 2019 (Hashem et al., 2021; DLS, 2019). Being a Muslim country, there is a seasonal demand of beef cattle during Eid-ul-Adha. To satisfy the animal protein requirement, beef fattening can play an important role. The Directorate of Livestock Services (DLS) of the Government of Bangladesh has taken beef fattening as an action program to generate income for

the rural poor farmer. Cattle are bought by the farmers usually 3-6 months before Eid-ul-Adha (Muslim festival) and then they are fattened and sold. In recent years the women farmers of Bangladesh have been involved and sustained beef fattening programs in rural areas of the country. The women farmers borrow money from local banks or NGO or other credit organizations. About 30 to 60% of the rural farmers' income came from cattle fattening business (Islam et al., 2012).

The shortage and high cost of animal feed are the greatest problem of the farmers for rearing cattle (Kamal et al., 2019, Hashem et al., 1999; Rahman et al., 2002). The information related to cattle fattening by rural farmers in Bangladesh is very poor. Detailed study is needed in different districts of Bangladesh to recommend cattle fattening programs for the rural poor farmers as an income generating activity. With the rising demand for quality beef and reasonable beef prices the availability of a relatively large supply of bull calves from small scale dairy is justifiable to study cattle fattening as an income generating activity in Bangladesh. To make the cattle fattening as a sustainable technology the socio-economic aspect of the farmers needs to be investigated. Therefore, the present experiment was undertaken to investigate the feeding practices, steroid application in fattening cattle and financial outcomes from cattle fattening

Materials and Methods

Study area

The present study was conducted in three unions namely Kursha, Sarai, Haragachh and at Kaunia upazila in Rangpur district. Preliminary visits were made for the selection of study areas. The data were collected through an interview schedule by selecting 45 respondents from three unions who were involved in cattle fattening.

Selection of farmers

The farmers were selected who were involved in small scale cattle fattening from each union under Kaunia Upazila. A total of 45 farmers (3 unions, 15 farmers from each union) were chosen for collecting data to fulfill the objectives. Parameters studied were roughage and concentrate supplementation, feed preservation method, rearing system of cattle, time of cattle fattening, source of water and ration formulation for cattle fattening. Utilization of steroids in cattle fattening, cost return analysis for cattle fattening and problems arose during cattle fattening was also investigated in this study.

Preparation of interview schedule

A structured interview schedule was carefully prepared keeping the objectives of the study in mind. The questions and statements contained in the schedule were simple, direct and easily understandable by the respondents. The schedule contained closed and open forms of questions. Some scales were included in the schedule, wherever necessary. The draft interview schedule was pre-tested in the study area. To identify the faulty questions in the draft schedule and necessary corrections were made on the basis of the pre-test results.

Methods of data collection

Data was collected from respondents by a one-to-one interview method. The data were collected following the direct interviews and making personal visits. Before making the actual interview, the objectives of the study and importance of using hormones and feed additives of cattle fattening were explained clearly to the respondents. Then the questions were asked in a very simple manner with explanation wherever necessary. To collect the necessary information from the respondents both interviewing and observation were applied. The relevant data for this study were collected without biasness. Some respondents had specific written documents and many of them had no specific written documents of their own. So, they had to reply mainly from their memory. To obtain accuracy and reliability to data, care and caution were taken in the course of data collection. Attention was paid to the mood of farmers and cordial relationship was established between the farmers and the researcher. Interviews were normally conducted in the respondent's house during their leisure time.

Processing of data

At the end of data collection, the collected data were coded, compiled, tabulated and analyzed. The local units were converted into standard units. The qualitative data were transferred into quantitative data by appropriate scoring technique. The responses of the respondents that were recorded in the interview schedule were transferred into a master sheet for entering the data into the computer.

Data tabulation and analysis

Data were carefully tabulated and analyzed with a simple statistical method to fulfil the objectives of the study. The collected data were first transferred to master sheets and compiled to facilitate the needed tabulation. Tabular technique was applied for the analysis of data using simple statistical tools like average and percentages through SPSS software.

Results and Discussion

Feeding practices for beef cattle fattening at Rangpur district

Table 1 shows the overall feeding strategy of beef cattle in Rangpur area by the rural farmers. Farmers offered roadside grass, cultivated fodder (napier, para, german, pakchong and maize), tree leaves and rice straw. Majority of the farmers supplied cultivated fodder (48.89%) rather than straw (26.67%) and roadside grass (17.78%). Only 4% farmer supplied tree leaves to their cattle during fattening practice. Hossain et al. (2016) reported that most of the farmers (83%) used cultivated fodder and only 17% farmers used cultivated fodder and roadside grass for fattening of their cattle. Recently, several researchers stated that grass based ration might be an option for cattle fattening (Kobir et al., 2022; Mustafa et al., 2020 and 2021). Rahman et al. (1998 and 1999) also stated that rural farmers supplied cultivated fodder, roadside grass and tree leaves to their cattle for fattening along with concentrate supplementation. Near about 35.56% farmers prepared concentrate mixture by their own and only 20% farmer ready mix or pellet produced from feed mill. Rest of the farmers (44.44%) supplied both ready mix and handmade feed mixture for cattle fattening. Concentrate feed ingredients enhanced the growth rate as well as the body weight gain of meat animals (Barman et al., 2017; Khan et al., 2004; Kawsar et al., 2006; Kim et al., 2012; Moniruzzaman et al., 2002; Sarkar et al., 2008).

Among the beef fattened farmers only 26.67% farmers had some idea of UMS preparation. Hay and silage user's were only 4.44 and 2.22% in the rural areas of Rangpur no farmers were supplied UMS during the fattening period. It was also found that about 66.67% farmers had no idea of treating feed or improve its quality. Urea molasses block and urea molasses straw are the processed concentrate and roughages that increase growth rate and body weight gain which also used for cattle fattening (Baset et al., 2002, Mazed et al., 2004). Kamal et al. (2019) stated that 30% farmer treated straw with urea and rest of the farmers didn't follow any treatment. In the case of the rearing system 44.44% followed intensive management and 55.56% followed semi-intensive management. Garcia-Torres et al. (2016) found that consumers chose beef produced from intensive organic farming at sensory level and grass-fed or extensive organic farming at the point of purchase. Kamal et al. (2019) stated that 30% farmer followed intensive management, 51.3% followed semi intensive management and 18.8% followed extensive management system in cattle fattening. Garcia-Torres et al. (2016) state that consumer chose beef produced from intensive organic farming or extensive organic farming at the point of purchase cost.

Eid ul Adha is a big Islamic festival in Bangladesh as majority of the people are Muslim. Solvent Muslim people sacrifice cattle, buffalo, goat or sheep at the day of Eid ul Adha. Therefore, most of farmer (57.78%) fattened their cattle before Eid ul Adha to supply their cattle in the cattle market before Eid ul Adha. Only 42.22% farmers were engaged in fattening practices throughout the year. About 58% respondents used feed additives for the period of 3 to 6 months cattle fattening (Islam et al., 2012). Hossain et al. (1996) reported cattle fattening period was near about 5 months in Pabna area. Islam et al. (2012) stated that majority (53.3%) of the farmer start fattening before Eid-ul Adha and the rest of them (47%) practiced cattle fattening round the year. Fattening period is an important issue because it measured profit percentage of the farmers. Ahmed et al. (2010) stated that the fattening period of cattle was 3-6 months before Eid ul Adha. Supply clean and hygienic water is an important health management issue of beef cattle. About 87% farmers of Rangpur area supplied clean and hygienic water to their cattle and rest 13% of the rural farmers depends on pond and river water which was not fully hygienic. Islam et al. (2012) stated that about 49% animals get safe water at village level of Bangladesh. It was vital that cattle should be provided drinking water by the farmers to ensure safety and it was considered as good practice. It was found that 82% farmers of Rangpur area formulated ration for cattle fattening with their own, but 18% of them prepared ration by the suggestion of consultant or technical personnel.

Table 1. Feeding practices of the beef fattened farmers (n=45)

Parameter	Categories	Number of respondents	% total respondents
Roughage	Roadside grass	08	17.78
	Cultivated fodder	22	48.89
	Straw	13	26.67
	Tree leaves	2	4.44
Concentrate	Compound feed/ Pellet	09	20.00
	Hand mixed feed	16	35.56
	Both	20	44.44
Preservation/Treatment	Hay	2	4.44
	Silage	1	2.22
	Urea molasses straw (UMS)	12	26.67
	Urea molasses block (UMB)	00	00
	None	30	66.67
Rearing system	Intensive	20	44.44
	Semi-intensive	25	55.56
	Extensive	00	00
Time of fattening	Before Eid ul Adha	26	57.78
	Round the year	19	42.22
Sources of water	Safe (Tube well)	39	86.67
	Unsafe (Pond, river)	06	13.33
Ration formulation	By own	37	82.22
	Consultant/Technical people	08	17.78

Use of steroid and feed additives during fattening of beef cattle

No farmers were used steroids and growth hormones for the fattening of beef cattle in the study area might be indicated that the beef produced in that area was steroid free and safe. Among the respondents only 22.22% farmers used growth promoter & antibiotics and the rest of them did not practice any kinds of growth promoter at the period of fattening (Table 2). Rahman et al. (2012) observed that about 34.7% farmers used beef fattening tablets in the rural area of Dinajpur district. Islam et al. (2012) reported that among the respondents 70.6% used anabolic steroid as a growth promoter and rest of them did not use any kinds of growth promoter. They also stated that steroids had a positive impact on growth rate or beef production and most of the farmers used anabolic steroid and feed additives as a growth promoter for cattle fattening. About 33.33% respondents used Avit-G, 27.54% Amovit-G and the rest used Radivit-DB, Hyvit-DB, Megavit-DB, Vitamin-DB, Curenal and Complete-DB. About 20.37% respondents also prefer Catasol, 18.51% Tocol, 16.66% Asol and rest of them used Catafos, Hematophen, Buphos-Vet, Phosvet, Hematopen, Dexadet, Tredexanol, Oradexon and Decason as fattening agent in the form of injection. About 44.44%, 25.92% and the rest of the farmers used Anora, Roxivet, and Anorexon, Pednivet, and Biolect Bolus, respectively in the form of tablet as fattening agent. This result differed from the statement of Ali (2011) who reported that 8% farmers used Pednivet and 78% used vitamin mineral premix as feed additives. This inconsistent might be due to cultural and /or geographical variation. Feed conversion efficiency was improved in bull calves by using Metafos (Minerals derivatives) and Biomix-DB (Vitamin-mineral premix). Barman et al. (2017) stated that only seven percent farmers used growth hormone for fattening of animals to produce meat. Islam et al. (2012) also stated that the low income farmers used more anabolic steroid.

Feed additives have made a great contribution to improve the performance and general health of livestock (Beeson, 1959). Based on the sources of feed additives, Islam et al. (2012) stated hat bout 49% respondents used vitamin mineral premix, 26% enzyme, 12% antibiotics and 13% anabolic steroids for cattle fattening. They also stated that 50% farmers knew about the use of feed

additives from neighboring farmers, 25% from livestock officer, 17% from NGO workers and the rest 8% from veterinary representative. This result differed from the report of Ali (2011) who found that 90% farmers used feed additives, 8% used vitamin-minerals premix and only 4% used anabolic steroids. Nichols et al. (2002) reported that in an intensive beef cattle production system use of steroid implants increased average daily gain by 15 to 25% and feed efficiency by 10 to 15% but decreased marbling was observed due to longer use of steroid implants. Platter et al. (2003) found that use of growth implants increased ($P<0.05$) average daily gain by 11.8 to 20.5% of steers. Huque and Sarker (2014) reported that different types of steroids were used rampantly for poultry and bovine in Bangladesh. Asem-Hiablie et al. (2017) stated that on average 30% of northwest and southwest ranches of the United States used growth implants for beef cattle production. Use of growth promoters was decreasing day by day due to awareness development through training of farmers. Only 22.22% farmers had knowledge about the health hazard effect of steroids and rest 77.78% didn't have any idea about the bad effect of steroid. Therefore, beef might be safe for human consumption in Rangpur area as they never use steroids or growth hormone during fattening period.

Table 2. Information about steroids and feed additives (n=45)

Parameters	Categories	Number of respondents	Percent of total respondents
Use of steroid and growth hormone	Yes	0	0
	No	45	100
Growth promoter & feed additives	Yes	10	22.22
	No	35	77.78
Knowledge about health hazard effect of steroid	Have	10	22.22
	Have not	35	77.78
Knowledge about feed act	Have	5	11.11
	Have not	40	88.89

Returns from the beef fattening

Cattle fattening is a profitable business in the rural area of Bangladesh. It was found that the average purchase cost of cattle was BDT 44086; feed cost was BDT 14658; medicine, vaccine & deworming cost were BDT 1525. Average sale proceed came from an individual animal was BDT 77130. It was found from the investigation that BDT 16861 was earned from single cattle having around 250 kg live weight within 2.5 to 3 years age. The rate of return was 28% from individual cattle including the selling price of manure. Begum et al. (2007) stated that BDT 2055 was returned from an investment of BDT 7528 and the rate of profit was 27%. An outstanding profit was stated by Sharma et al. (2014). They stated that the net margin earned by the farmer was BDT 13,350.84 per cattle. The benefit cost ratio of the cattle fattening enterprise was 0.52 that means the average return on every BDT invested for beef cattle fattening was 52%. That return was higher than the prevailing public and private manages 16-20%, which implying that beef cattle fattening operators.

Table 3. Returns from the beef fattening (n=45)

Attributes	Mean±SD (BDT/cattle)	Range (BDT/cattle)	
		Minimum	Maximum
Animal purchasing cost	44086±2950	40500	47300
Feed cost (roughage + concentrate)	14658±2492	12320	15280
Medicine + vaccine + deworming cost	1525±438	1070	1945
Total cost involvement/cattle	60269±3496	-	-
Sale proceed (animal price + cow dung price)	77130±4566	75500	84570
Net profit (Sale proceed – all costs)	16861±3722	14500	24100

Conclusions

Cattle fattening practices are widely practiced before Eid ul Adha in Rangpur district of Bangladesh. The farmers used available roughages and concentrates only for cattle fattening and no steroids & growth hormones were utilized in the study area. Only few farmers used feed additives and vitamin mineral premix with concentrate feeds during fattening period. Traditional beef production in Rangpur district with local feeds might be safe regarding steroid and health hazard issue. It is also an income generation activity of rural poor that helps to earn some cash money before religious festival.

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