

ADOPTION OF BEEF FATTENING TECHNOLOGY AND ITS SOCIO-ECONOMIC EFFECTS OF BENEFICIARIES LIVELIHOOD

A Seminar Paper
(Individual Assignment on Module-2)

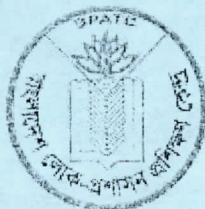
Submitted to

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Bangladesh Public Administration Training Center, Savar, Dhaka

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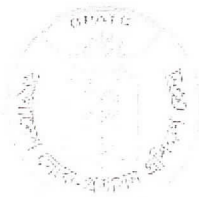
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LIST OF ABBREVIATIONS

BLRI	Bangladesh Livestock Research Instititute
BDT	Bangladesh taka
BQ	Black Quarter
DLS	Department of Livestock Services
<i>et al.</i>	<i>et alii</i>
FMD	Foot and mouth disease
GDP	Gross domestic product
MoFL	Ministry of Fisheries and Livestock
UMS	Urea molasses straw
UP	Union Parishad

ADOPTION OF BEEF FATTENING TECHNOLOGY AND ITS SOCIO-ECONOMIC EFFECTS OF BENEFICIARIES LIVELIHOOD

ABSTRACT

Beef fattening technology is a compensatory genetic makeup technology of livestock developed by BLRI and popularized by DLS, NGOs and farmers own acceptance. To meet up safe protein requirement, this technology widely accepted and adopted in the farmers level and it has positive impacts on public health significance. However, to assess the socioeconomic status, profitability and problems of beef fattening technology, this study was conducted on 25 beef fatteners in Sharifbag village, Dhamrai from mid-April to mid-August 2020. A survey was conducted with structured questionnaire including the social parameters and cost and benefit parameters. The profitability of beef fattening and result was analyzed through net margin (NM) formula and Cobb-Douglas equation regression model. The survey result indicated that 5 to 10 years experienced Muslim male farmers with secondary education were more interested to beef fattening technology. Before the occasion of Eid-Ui-Azha farmers were very much interested to adopt the technology of beef fattening with cross breed cattle. Cost and profit ratio before adaption of beef fattening technology was 0.11, where cattle purchase price was 45000 and selling price was 65000. Hence, after adoption of 3-4 months of beef fattening technology cost and profit ratio was 0.46 where selling price, other variable and depreciation cost was fixed, but selling price were higher (1, 10,000). Therefore beef fattening is a magical weight gain technology where result shown that weight gain percentage increase 86.67%, 62.09% and 59.63% in local, cross and highly cross bred cattle respectively after adoption of beef fattening technology. In statistical analysis through linear regression model this result was significantly correlated to cost and profit ratio before and after adoption of beef fattening technology where P-value was $P < 0.01$. However beef fattening is a high profitable technology and had a positive effects on socio economic status of the farmers but it sometimes hampered by high feed price and labour cost. In conclusion, adoption of beef fattening technology is a low investment- high return technology that positively creates eagerness for adoption of beef fattening technology and improved the socioeconomic status of the farmers.

Keywords: Beef fattening, cattle, profitability, nutrition, economic analysis.

INTRODUCTION

Livestock sector is the most important sector for ensuring about 72% animal protein source through meat, milk and egg per person in Bangladesh and contributing 1.47% in GDP. There is about 24.23 million cattle population in Bangladesh (DLS, 2019) and preferably beef fattening encompasses through cattle fattening (Kamal *et al.*, 2019). According to Bangladesh Tanners Association (2019), about 8 million cattle are slaughtered through the year-round in Bangladesh. Beef fattening specially cattle fattening is the most popular livestock technology

in Bangladesh. Basically, it is a high profitable and challenging technology in small holder farmers and young entrepreneurs in Bangladesh. It is a breed specific genetic makeup feed compensation technology through nutrition and health management, done within 3 to 6 month usually before Muslim festival Eid-ul-Azha (Islam *et al.*, 2012). There are about 64% farmer respondent to beef fattening within 3 months prior to Eid-ul-Azha (Kamal *et al.*, 2019). However, beef fattening signifying the cattle farming for profitable meat production. It is usually, four stage packages followed by stage one- selection of emaciated cattle for producing their compensatory body growth around 60 to 120 days for the purpose of meat production. Stage two- Deworming and vaccination against endemic diseases identically, Foot and Mouth Diseases (FMD) and Black Quarter (BQ). Stage three: Supply nutritious feeding for considerable live weight gain. Finally, Stage four: Marketing rapidly, usually before national or religious festival. However, beef fattening is the most reliable, profitable and popular farming system even young educated people for poverty alleviation, employment, women empowerment that influences socioeconomic status with ensure animal protein supply in Bangladesh (Sarma *et al.*, 2014, Akteruzzaman *et al.*, 2008). Beef fattening is the most out-to-date livestock technology in Bangladesh developed by Bangladesh Livestock Research Institute (BLRI) and popularized by Department of Livestock services (DLS) at rural people. In the very recent year, use of anabolic, steroid or growth promoter in beef fattening causes an alarming issue that concerning public health issue. But the Ministry of Fisheries and Livestock (MoFL), Government of Bangladesh ensuring safe animal production through beef fattening previous five to six years, and resulting Bangladesh can produce sufficient number of cattle population during Eid-ul-Azha and other religious and national festival (DLS, 2019). However, considering the economic impact of beef fattening technology the research was under taken with following three major objectives- (a) To assess the socioeconomic status of purposely selected beef fattening technology adopted farmers. (b) To estimate the profitability of beef fattening venture of farmers. (c) To identify the problem related to adoption of beef fattening technology and profitability.

REVIEW OF LITERATURE

The experiment was conducted to analyze the effect of training led by joint venture by Micro-Finance and Technical Support (MFTS) and Palli Karma Shohayak Foundation (PKSF) for dissemination of livestock technologies for the development of poor people of Bangladesh. A sum of 632 families were surveyed during April to September 2006 after a multistage stratified random sampling Evidence shown that both project and non-project recipients were under the primary education and their family size was marginally higher (5.3) than the national figure. The member of the families greatly in the working age (>15 years) demonstrated a positive response of participating in various income generating activities (IGAs). It is clear that the rate and amount of credit was higher with the client received training than non-trainees. The amount of adjustment of technologies was higher than the level of thought on the idea of housing, feeding, medication, breeding and marketing. The training recipients improved information on feeding, management and Veterinary services of livestock and poultry. Training and exhibition are two strong tools for adaptation and

dissemination of poultry and livestock technology. The yearly income of trainees and non-trainees family units expanded to 31.22% and 18.20% individually where the income from various IGAs of domesticated animals was 56.04% and 68.20%. Livestock stakeholders IGAs were not really value sensitive yet more delicate on non-price factors, for example, institutional help, input quality and accessibility of input. Therefore, the training, along these lines contributed moving livestock technologies which eventually affected in positive response of livelihood of the project recipients than the non-project recipients (Akhtaruzzaman *et al.*, 2008).

A research study was conducted entitled as “Present status on the use of anabolic steroids and feed additives in small scale cattle fattening in Bangladesh in 2012 for the purpose of determine the relationship among various attitude of cattle fattening through use of anabolic steroids and feed additives. However, interviewed was done through structured questionnaire from 150 respondents in three districts concerning small scale cattle farming. Hence, socio-economic conditions and effects of steroids hormone in cattle fattening under considerations. In that districts about 72% farmers involved in agriculture and 23.3% involved in livestock business. Result revealed that 58% farmers were used to anabolic hormones during 3 to 6 month beef fattening programs. In statistical analysis by chi-square test when using anabolic steroids was decreased, annual income was increased in the farmers. The significant ($P < 0.01$) affiliation was seen in the event of anabolic steroids and inflow of money, yearly income, number of cattle fattening, breeds, fattening duration, beginning and slaughtering time. The reestimation of yearly income, inflow of money, beginning and slaughtering time were significantly associated with feed additives. However, 78% farmers utilized feed additives for cattle fattening from own assets ($P < 0.001$) and a large portion of beef fattener for 3 to a half year ($P < 0.01$). The outcome showed that fatteners of low yearly income utilized more anabolic steroid and feed additives as a growth promoter for cattle fattening and they like in powder formulation (Islam *et al.*, 2012).

Bangladesh Agricultural University Research System (BAURES) and Department of Agribusiness and Marketing, Bangladesh Agricultural University was conducted a study with a total of 150 cattle fatteners were randomly selected in Pabna and Sirajgonj district to examine the profitability of beef cattle fattening in the northern chararea of Bangladesh. They showed that, despite beef cattle creation was beneficial agribusiness the greater part of the ranchers receives conventional beef fattening framework for meat stuffing objective the cattle promoting during the Muslim celebration "Eid-ul-Azha". Gainfulness edge approaches BDT 13,350.84 per cattle. The benefit cost ratio of the whole undertaking was 0.52 that implies cattle fattening venture is beneficial and attainable business endeavor. The serious issues confronting the ranchers incorporate significant expense of feeds, deficient credit offices, illness assault, illicit utilization of human medications for cattle fattening, value variance and lacking expansion services. An arrangement and research accentuation ought to be intended for takes care of feed creation at reasonable cost to the fatteners and fatteners ought to be instructed on the most proficient method to plan local feeds to decrease cost and access to takes care of for better effectiveness and debilitate to utilize human medications, tablets and infusion for cattle fattening (Sarma *et al.*, 2014).

Chittagong Veterinary and Animal Sciences University was led a study to check the economic effectiveness of beef cattle fattening in those upazilas of Kushtia locale in Bangladesh utilizing an organized poll which was regulated to 46 haphazardly chose cattle fatteners from around 400 cattle fattening farmers in the Kushtia region. Most of the female are comprises in beef fattening (42%). The information sources utilized for beef fattening were feeder cow, feed, drugs/vaccines, labour, water and potash/salt. Most of the information sources are given at the rate for per cow 450tk/month (6%). Right now of 46 respondents 24% were uneducated, 46% primary levels, 14% SSC level. The rancher had claim capital about 42%, and 46%% respondents takes bank credit. A large portion of the fatteners (46%) fattened cattle for 2-3 months and rest fattened for a drawn out period. About 40% fatteners were utilized cross breeds for cattle fattening and rest fatteners are utilized local, pabna, nepali and so on. About 74% fatteners are not taking any coaching on beef fattening. About 82% fatteners utilized deworming, 10% fatteners utilized urea molasses straw (UMS) and 8% followed regular taking care of. About 24% immunize the cows without anyone else and about 76% not inoculate (Siddique 2014).

In Ethiopia, an experiment was directed to examine the beef cattle fattening practices and its difficulties. Farmers utilize male animals for fattening reason. The ranchers utilize various criteria to choose the best animals to be fattened, and age, body size and body condition status of the animals is among the significant ones. Concerning housing status of the animals to be fattened, 61.1% of the fattening houses had total rooftop and side dividers to defend the animals from predators and being presented to rain and daylight. Then again, 38.9% of the fattening houses were built without rooftop, yet fenced with various locally accessible fencing materials, for example, wood, prickly plants and stones. Around all (97.2%) of the fattening houses' ground were soil type without seepage system. The beef cattle fattening in investigation territory is tested by various requirements, for example, deficiency of feed (100%), lack of land (78.7%), market issue (75.9%), and illness (58.3%) (Gebremichael *et al.*, 2017).

Deptment of Animal Science and Nutrition, Hajee Mohammad Danesh Science and Technology University, Dinajpur, Bangladesh was organized a study to explore the impact of different financial factors on the benefit of cattle fattening farm of rustic ranchers at the three Upazilas (Fulbari, Birampur and Hakimpur) in Dinajpur region of Bangladesh through field inquiry from haphazardly chosen 60 (sixty) farmers the individuals who were associated with little scope cattle fattening. Out of 60 quantities of fatteners, depend on the experience of the farmers, the highest average profit per animal of Tk. 7661.11 ± 1183.28 was gained by the gathering having experience over 10 years (30%) followed by the gathering having experience between 6 to 10 years (36.67%) and the gathering having experience under 5 years (33.33%) separately. As per the information gathered on size of the farm dependent on number of cattle, it was discovered that the highest average profit per animal of Tk. 8073.81 ± 1308.01 was gained by the gathering having more than 20 cattle (35%). Based on coaching on fattening taken by the fatteners, the highest average profit per animal of Tk. 8072.22 ± 799.85 was gained by the gathering those took conventional preparing (30%). Discoveries on

utilization of technology for fattening demonstrated that those fatteners utilized Urea Molasses Straw (UMS) technology (40%) gained highest average profit of Tk. 7962.50 $\pm$ 891.41 per animal followed by the fatteners those utilized fattening medication (45%) and the fatteners those didn't utilize any technology. Based on vaccination of animals, the outcomes indicated that those fatteners utilized vaccine normally (63.34%) gained highest average profit of Tk. 7946.05 $\pm$ 1033.77 per animal. Correlation analysis showed that five socio-economic elements of the ranchers, specifically experience of ranching, size of the farm, coaching and technology utilized and vaccination had noteworthy positive associations with the average profitability per animal of farm. Then again, age and level of literacy had negative relationship with the average profitability per animal of farm. The more the involvement with farming appears to acquire more benefit (Arjuet *al.*, 2017).

To get highest profit, the improvement of farm management needs to meet the criteria of feasible improvement were partner between the interests of monetary, social, cultural and ecological stability an investigation was directed in Ciamis Regency, West Java Province, Indonesia from 100 beef cattle farmers. MDS (Multi-Dimensional Scale) was utilized to examine the status of beef cattle fattening suitability. The outcomes show that beef cattle fattening synchronously less suitable with 37,66 index, yet somewhat the index values of ecology, economy, socio-cultural, technology and infrastructure, and institutional measurements separately 69,71%, 63,10%, 43,93%, 11,54% and 00,00%. The prevailing characteristic of ecology dimension is cowshed neatness, while very predominant is the use of agricultural waste to cattle feed and accessibility of WWTP for waste management. The predominant characteristic of economic dimension is place for ranchers to sell the cattle. The prevailing characteristic of socio-cultural measurement is the recurrence of expansion and training of beef cattle fattening. The predominant characteristic of technology and infrastructure measurement is the utilization of vitamins and probiotics to prod the development of cattle, while very predominant is the accessibility infrastructure or public facilities, for example, slaughterhouses and markets. There is no prevailing characteristic of institutional measurement; however all of the characteristics on the institutional measurement ought to be the focal point of consideration regarding improvement (Isyantoet *al.*, 2015).

A study was conducted to look at the benefit of beef cattle fattening in Bama Local Government Area of Bornu State, Nigeria from randomly chose 45 fatteners from two areas. Moderately aged farmers in place of old and youthful farmers were mostly engaged with fattening business in the territory and it was similarly discovered that around 87 percent of the farmers have predilection for three months fattening plans. The type of cattle usually selected for fattening in the investigation area was Ambala. The quantities of cattle favored by maximum fatteners were somewhere in the range of 5 and 6 cattle, means that they are working at a very small scale. Besides, the investigation showed that the weight and price gains of 136% and 147% were reported by fattened animals separately inside a time of 3 months, and an overall profit of N225,000 (\$1,923). This shows to N 75,000 (\$641) monthly incomes that are far over the salary of senior government workers in the Nigerian public service sector. This outcome has powerful significance as it has exhibited that cattle fattening

could be packaged as poverty reduction program with least government contribution at Local, State and National levels (Omolehinet *al.*, 2009).

A study was conducted to evaluate the specialized proficiency of beef cattle fattening production in Nigeria from randomly chose 100 farmers. The outcome indicated that 70% of the fatteners fall inside the gainful age of 31-50 years. 88% of fatteners were men and 80% had no proper training. The evaluated specialized proficiency of the beef cattle fatteners ranged from 51% to 79% with a mean specialized proficiency of 64%. The variety in the degree of specialized proficiency demonstrates that many opportunities exist for beef cattle fatteners to boost cattle production and earnings through enhancements in their specialized proficiency. Determinants of specialized proficiency of beef cattle fatteners were seen as feeder cattle group size, labour, and feeds/supplement, veterinary assistance's and capital, since every one of these factors were seen as positive and significantly connected to specialized proficiency (Moses 2017).

A study was conducted to explore the management and feeding practices related with on-farm death rate (mortality) on 63 beef cattle farms in Austria, Germany and Italy with housing arrangement/structure other than completely slatted pens. Data on mortality and 56 sorted variables identifying with the neatness of animal facilities, health and feeding system, animal-human connection, cattle transport and origin were accumulated during on-farm interview. Samples of total mixed rations (TMRs) were gathered and examined for chemical structure and molecule size distribution. Four categorical components, alluding to biosecurity measures and management, were held in the last multivariable model, with country impact. Purchasing cattle from just one farm, no mix up of animals during transport, appearance of a devoted sick pen and maintaining production records were related with lower rate mortality (Brscicet *al.*, 2018)

An experiment was directed for investigating the frameworks of the executive's small scale cattle fattening. The information was gathered through a meeting plan with structured questionnaire from 215 farmers of 24 locales in 52 upazilla who were associated with little scope of beef fattening. . In this investigation out of 215 respondents 70.4% were farmers, 11.7% involved in business, 9.18% doctors, 2.04% specialists had own land and 8.8% respondents had no own farming area. About 40.9% farmer chosen cattle based on age and 14, 25.6 and 16.7% respondents chose based on breed, age and sex, individually. The vast majority of the respondents (79.1%) were practiced beef fattening for 3-6 months and rest fattened for a delayed period. About 90.2% respondents utilized own capital for cattle fattening and 2.3, 4.2 and 3.3% respondents took bank loan, NGO credit and loaning for cattle fattening, separately. About 31.6% respondents gave existing conventional cattle shed. About 79.5% didn't have any training on cattle fattening though about 20.5% respondents had taken short training on it. About 63.7% respondents' utilized steroid tablets, 27% respondents utilized urea molasses straw (UMS) and 51% followed conventional fattening techniques. . About 72.6% immunize the cattle without anyone else and about 76.3% took help from veterinary specialist for treatment of their animals. About 45% detailed deficiencies of

animal feed, 50% revealed absence of credit and 95% announced significant expense of feed as the serious issues of little scope beef fattening. The consequences of this examination will be valuable for farmers and specialists to distinguish the general issues and their cures on taking care of, the executives and showcasing identified with little scope of beef fattening in Bangladesh (*Ahmed et al.*, 2012).

A research worked test was directed to explore the variables identified with little scope of beef fattening in three upazilas (Birganj, Kaharul, and Khansama) of Dinajpur region in Bangladesh. Information was gathered utilizing a meeting plan from haphazardly chosen 75 farmers who were associated with little scope beef fattening programs. In this experiment, out of the 75 farmers 54.7% are associated with agribusiness, 26.7% in business, 13.3% in public service and 5.3% in beef fattening. About 44.7% farmers were conducted in beef fattening in 3 months. However, 56% farmer utilized own capital for fattening, 24% took bank advance and remaining farmers conducted financial loan from others sources. About 57.3% ranchers had taken short training on cattle fattening and other 42.7% didn't take any training of beef fattening. However, 34.7% ranchers used feed additives like beef fattening tablets, 28.0% Urea Molasses Straw (UMS), 26.7% utilized Urea Molasses Block (UMB) in this fattening practices. Moreover, 66 percent farmers had deficiencies of animal feed, half announced absence of money and 93.3% revealed significant expense of feed as the serious issues of small scale farming. Thereafter, it may conclude that, feeding practice and socioeconomic conditions was important issues for beef fattening practiced in Bangladesh (*Rahman et al.*, 2012).

MATERIALS AND METHODS

Study Location

This research study was conducted at Sharifbag village in Dhamraiupazila, Dhaka district.

Study Design

The sharifbag village was developed as animal model village by Bangladesh Livestock Research Institute (BLRI) with the association of Upazila Livestock Office and Union Parishad, Dhamrai, Dhaka. In BLRI survey, 2020 there were 950 cattle, 150 goats, 50 sheep and 3500 poultry species present in the model village. However, BLRI adopted their developed livestock and poultry technology in that village including, Beef fattening, FMD and PPR control model, Feed master apps, high yielding fodder variety, Total mixed ration (TMR), Urea molasses block (UMS), silage, etc. Hence, randomly 25 beef fattening farmers were selected for conducting the research.

Data Collection: By using structured questionnaire, data was collected through farmer's face to face interview. To know the profitability of beef fattening technology was the main objectives of the structured questionnaire. Hence, to know the economic impacts of beef fattening technology, the survey was conducted two times with same questionnaire including the pre and post adopted the beef fattening technology. The study period was before Ramadan to after Eidulazha, 2020 (4 month).

Data analysis- The profitability or cost benefit analysis of beef fattening was analyzed through Rahman *et al.* (2002).

$$NM = TR - TC \dots\dots\dots (1)$$

$$TC = TVC +TFC \dots\dots\dots (2)$$

Where
 NM = Net Margin
 TR = Total Return
 TC = Total Cost
 TVC = Total Variable Cost
 TFC = Total Fixed Cost

However, the relationship between inputs and outputs during beef fattening was estimated by Cobb-Douglas production function (Jimjelet *al.*, 2014).

$$Y = aX_1b^1 X_2 b^2 X_3 b^3 X_4 b^4 X_5 b^4 X_6 b^4 U_i \dots\dots\dots (1)$$

This analysis would be calculated as double logarithm function in linear regression

$$\ln Y = \ln a + b_1 \ln X_1 + b_2 \ln X_2 + b_2 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + U_i$$

Where
 Y= Weight gain
 X₁ = Feed cost
 X₂ = Medicine or veterinary cost
 X₃ = Labour cost
 X₄ = Time of fattening
 b = Coefficients and U_i + Error term

However, relationships among socioeconomic impacts like farming knowledge, market price etc will be estimated by spearman’s correlation coefficient (r_s) using SPSS 17.0.

$$r_s = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)} .$$

Where
 n = number of observations
 d_i = rg(X_i) – rg(Y_i), difference between the observations

RESULTS

For analyzing the result after adoption of beef fattening technology and its socio-economic effects of beneficiaries livelihood several features were under considerations like socio-economic features of cattle fattening farmers, animal for beef fattening, feeding practice, cost and profit from beef fattening program (per cattle) before and after beef fattening technology adoption and problems affecting beef fattening by farmers perspective.

The socioeconomic parameters of the beef fattener farmers

The socioeconomic parameters of the beef fattener farmers of Sharifbag village was categorized as age, sex, religion, farming patters, educational status, farm size, experience, number of animal, duration, and training. The socioeconomic features were reflected in the results that farmers age group between 41-50 years was higher as 56% comparing to other age group. Although male farmers were more (60%) engaged in fattening than female (40%). The Muslims people were rocketed engaged (92%) in beef fattening than other religious group. But the participation of female in fattening farming becomes increasing day by day. About 60% farmers were involved in fattening as part time job. According to educational status, the farmers with secondary level education were more (52%) involved with this technology than other education level. Sharifbag is an area going to be urban status, so there is scarcity of land for farming and most of the farmers were landless (64%). Most of the beef fattening farmers were experienced about beef fattening and it was 5 to 10 years experienced of 72% farmers. Hence, it could be implied that farmers are known about fattening but not as beef fattening technology. The farmers of the studied area were in small holding farmers and most of the farmers reared 2 to 5 cattle’s in their farms for fattening programs. However, highest time duration for fattening program was 0 to 4 month. After development of BLRI model village farmers were exposed to different technology specially beef fattening from BLRI. Hence, majority of the farmers got 1-3 days training several time (72%). There after all these result were shown in Table 1 for more clarification.

Table 1: Socio-economic features of cattle fattening farmers

Characteristics	Variables	Frequency	Percentage (%)
Age (Years)	20-30	3	12
	31-40	5	20
	41-50	14	56
	51-60	3	12
Sex	Male	15	60
	Female	10	40
Religion	Muslims	23	92
	Hindus	2	8
	Others	0	0
Farming Pattern	Full time	10	40
	Part time	15	60

Characteristics	Variables	Frequency	Percentage (%)
Educational Status	Illiterate	0	0
	Primary level	5	20
	Secondary level	13	52
	Higher secondary level	5	20
	Graduate or above	2	8
Farm size (hactor)			
Landless (0.01-0.05)		16	64
Marginal (0.06-0.10)		7	28
Medium (0.20-1.00)		2	8
Experience of beef fattening(Years)	<5 Years	2	8
	5-10	18	72
	11-15	4	16
	16 above	1	4
Number of Animal Fattened	2-5	13	52
	6-9	8	32
	>10	4	16
Duration of Fattening (Month)	0-3	2	8
	0-4	17	68
	0-6	4	16
	7-10	2	8
	>11	0	0
Training on beef fattening technology (BLRI, DLS, NGOs)	1-3 days	18	72
	4-7 days	5	20
	>8 days	2	8

Selection of animal for fattening

For considering the animal selection for beef fattening absolutely cattle were reared for beef fattening program in the selected area and farmers usually purchased animal for fattening (72%) than own farm origin. Cross bred animal more choosable (68%) than local and highly crossed bred cattle. Eid-UI-Azha is the biggest religious ceremony of Muslim and lots of cattle become sacrificed in that day. Therefore, highest (72%) farmers chose fattening program before Eid-UI-Azha. The results related to animal for beef fattening were shown in Table 2.

Table 2. Animal for beef fattening

Characteristics	Variables	Frequency	Percentage (%)
Species	Cattle	25	100
	Sheep	0	0
	Goat	0	0
	Buffalo	0	0
Animal source	Purchase	18	72
	On farm	7	28
Breed	Local	5	20
	Cross	17	68
	Highly cross	3	12
Season for beef fattening	Before EidulFitre	5	20
	Before EidUIAzha	18	72
	After eidulAzha	2	8

Feeding practice on beef fattening technology adoption

According to BLRI beef fattening technology treated feed was the best approach for feeding practice for promoting compensation of total body requirements of the animal. Hence various treated feed formula was applied according to ingredients availability and farmers choice like, green grass with concentrated feed, TMR, UMS with concentrated, molasses straw with concentrated and green grass etc. According to the technology, farmers were demotivated to use steroids in the fattening cattle due to customer's rejection and unhealthy issues. However, electronic and print media were more conscious about these issues. The beef fatteners were conscious about these unethical issues and they did not used steroids in their fattening animals (0%). Moreover, BLRI people monitored the feeding and health management. Among them, the fattening farmers were choosing molasses straw with concentrated and green grass for fattening (44%) in Sharifbag village. However, all the result on feeding practice shown in Table 3.

Table 3. Feeding practice for beef fattening

Characteristics	Frequency	Percentage (%)
Green grass + Concentrate	3	12
Total Mixed Ratio (TMR)	2	8
Urea molasses straw (UMS)+ Concentrate	2	8
Molasses straw + Concentrate + Grass	11	44
Green grass + Roughage+ Concentrate	7	28
Feeding + steroids hormones	0	0

Cost and Profit from beef cattle fattening program (Per Cattle) before adoption of fattening technology

The consequence of the beef fattening budget analysis express that the cost of cattle fattening comprises two principle components, like as as variable cost and fixed cost. In beef fattening program variable cost included the price of cattle before fattening, feed cost, veterinary cost, labor cost, electricity cost etc. However, on the opposite site fixed cost included as depreciation cost like mangers, waters, pump, land rent etc. The purchase value of cattle was highest as 71.59% and variable cost was 96.74% with total fixed cost was 3.26% (Table 4). The study revealed that average cattle purchase price was 45000 tk and selling price after fattening program was 65,000 tk. Therefore, total return found 71,000 tkwhereas total cost was 62,850tk. Therefore,before adapting the beef fattening technology, the surveyed 25 farmers invested average 62,850 TK.In the study, the cost benefit ratio of cattle fattening before the adaptation of cattle fattening program ratio 0.11.Here table 4 revealed the result of cost benefit ratio.

Table 4: Cost and Profit from beef cattle fattening program (Per Cattle) before adoption of fattening technology

Return		Cost		
Line item	Amount (BDT)	Line items	Amounts (BDT)	
Selling price of fattened beef cattle	65,000 (91.54%)	Variable costs (VC)	Amount	Percentage
Sale of manure	6,000 (8.45%)	Purchase price of fattened beef cattle	45,000	71.59905
		Feeds	10,000	15.9109
		Medicine/veterinary cost	1,000	1.59109
		Labor cost	1,000	1.59109
		Electricity bill	3,00	0.477327
		Toll given	500	0.795545
		Commission	1,000	1.59109
		Conveyance	1000	1.59109
		Miscellaneous	1000	1.59109
		Total variable cost (TVC)	60,800	96.73827
		Fixed cost (depreciation cost)		
		Mangers	200	0.318218
		Waterer	200	0.318218
		Rakes	100	0.159109
		Spade	100	0.159109
		Tubewell /Pump	300	0.477327
		Shade	100	0.159109
		Bucket	50	0.079554
		Land rent	1000	1.59109
		Total Fixed Cost (TFC)	2050	3.261734
Total return (TR)	71,000 (100%)	Total Cost (TC)= TVC+TFC	62,850	100
Net Margin (NM)= TR-TC= 8,150				
Ratio= 0.11				

Cost and Profit from beef cattle fattening program (Per Cattle) after adoption of fattening technology

Adoption of beef fattening technology prognoses to high body weight gain due serial four stages beef fattening program. Beef fattening technology actually full filled the genetic makeup of the animal resulting assured body weight gain. In economic analysis profitability ratio is increased after adoption of beef fattening technology, usually high body weight gain selling at high price. However, the survey revealed that the total cost beef fattening program per cattle after adoption the technology was 62,850 Tk that was similar to the before adoption

of the technology. But compensation of live body weight, body weight was increased and selling price become higher as 1,10,000, therefore the total return over total cost was 1,16100 tk. Therefore, the study revealed that, the cost benefit ratio of cattle fattening after the adaptation of cattle fattening program ratio was 0.46. Hence it implies that the investment taka 1 through beef fattening program, the return will come 1.46 taka. Here table 5 revealed the result of cost benefit ratio after adoption of beef fattening technology.

Table 5: Cost and Profit from beef cattle fattening program (Per Cattle) after adoption of beef fattening technology

Return		Cost		
Line item	Amount (BDT)	Line items	Amounts (BDT)	
Selling price of fattened beef cattle	1,10,000 (94.82%)	Variable costs (VC)	Amount	Percentage
Sale of manure	6,000 (5.17%)	Purchase price of fattened beef cattle	45,000	71.59905
		Feeds	10,000	15.9109
		Medicine/veterinary cost	1,000	1.59109
		Labor cost	1,000	1.59109
		Electricity bill	3,00	0.477327
		Toll given	500	0.795545
		Commission	1,000	1.59109
		Conveyance	1000	1.59109
		Miscellaneous	1000	1.59109
		Total variable cost (TVC)	60,800	96.73827
		Fixed cost (depreciation cost)		
		Mangers	200	0.318218
		Waterer	200	0.318218
		Rakes	100	0.159109
		Spade	100	0.159109
		Tubewell /Pump	300	0.477327
		Shade	100	0.159109
		Bucket	50	0.079554
		Land rent	1000	1.59109
		Total Fixed Cost (TFC)	2050	3.261734
Total return (TR)	1,16,000 (100%)	Total Cost (TC)= TVC+TFC	62,850	100
Net Margin (NM)= TR-TC= 53,150				
Ratio= 0.46				

Weight gain due to adoption of beef fattening technology

As previously described beef fattening technology as compensatory genetic makeup body weight gain technology through supplying balanced diet as per requirement with veterinary support, it is highly profitable to farmers and ensures meet quality. However, the body weight gain after adoption of beef fattening technology of local, cross, highly cross was 86.67%, 62.09% and 59.63%, respectively. Therefore, it was implied that local breed compensation body weight gained become higher than other breed. But farmers choose cross bred due to feed conversion ratio (FCR), and increased profitability.

The result related to body weight gained was shown in Table 6.

Table 6. Weight gain due to adoption of beef fattening technology

Breed	Average Weight gain (Live weight) in Kg			
	Before technology adoption	After technology adoption	Difference	Increased rate (%)
Local	105	196	+91	86.67
Cross	182	295	+113	62.09
Highly cross	218	348	+130	59.63

Problems affecting beef cattle fattening as perceived by fatteners

Although beef fattening program is a high profitable technology but it has some problems described by the farmers that hampers the more profitability of the programs. The respondents farmers faced twelve types limitation during adoption this technology where was highest problem the faces on feed cost and labor cost (92%). Other problems they faced including lack of livestock services, cattle price fluctuation, feed in availability, vaccination, diseases as 72%, 68%, 56%, 48% and 36% respectively. This result was shown in Table 7.

Table 7: Problems affecting beef cattle fattening as perceived by fatteners

Problems	No. of respondents	Percentage (%)
High cost of feeds	23	92
Inadequate of credit facilities	7	28
Cattle theft	5	20
Disease attack	9	36
Animal vaccination	12	48
Price fluctuation	17	68
Higher transportation cost	7	28
Lack of Livestock services	18	72
Cattle feed in availability	14	56
Costly labor	23	92
Steroids use	0	0
Lack of knowledge of fattening	3	12

Regression coefficient analysis results for beef fattening after adoption of the technology

The numerical economic data was collected through the structured questionnaire among the 25 technology adopted farmers at Sharifbag village were subjected to regression analysis by using functional statistical format (double-log linear) to determine the consequences of independent variables on compensatory bodyweight gained by the cattle within the 0 to 4 month of fattening programs. Hence, on the basis of economical and statistical inference Cobb-Douglass equation was preferred as the best fit.

However, the regression analysis of the beef cattle fattening was R^2 values to be 89%. That reveals that variation in revenue achieved from beef fattening of cattle were explained by the independent variables ($X_1 \dots \dots \dots X_n$). However, the F-ratios were highly significant at ($P < 0.01$), confirming the significance of the concern variables in the cattle fattening technology. And the coefficients of beef fattening programs positively correlated with the farmers return from cattle fattening except the increasing price of labour and feed cost. Moreover, animal purchasing price and feed price significantly affects the beef fattening programs where $P < 0.01$.

CONCLUSION

Beef fattening technology is the most successful livestock technology in Bangladesh. This technology also ensured save protein production and also ensuring young and women empowerment. However, to see the high profitability of beef fattening, educated young people adopted this technology as source of employment. Moreover this technology is now an agribusiness which lead to stop unauthorised animal movement from India during Muslims ceremony like Eid-ul-Azha festival in Bangladesh from recent 5-6 years. Although Ministry of Fisheries and Livestock gives more initiative and technical support for sustainable this Technology. However, recent 3-4 years involvement of veterinary medical team in Hut for selling animal during the time of Eid-ul-Azha ensuring selling healthy animal and avoiding mal practice of steroids in beef fattening, and Bangladesh is now the the surplus production status of meat production. Therefore, analysing the result of adoption of beef fattening technology in Sharifbag village, Dhamrai also verified that after adoption of beef fattening technology among in fatteners, the profitability was 0.46. Which mean that investment of 100 tk profit comes to minimum 146 tk. Moreover, fifty fifty cross bred cattle is highly profitable for beef fattening. Proper training in fatteners, low feed cost and community involving of farm mechanisation is required for more profit of this technology. Hence, involvement of researchers, extension people, farmers, stakeholders and policy maker is required for sustainability of this technology and improvement of socioeconomic status of beef fatteners.

RECOMMENDATIONS

1. Hands on training for adoption of the beef fattening technology.
2. Use of modern technology for feed production, processing, and nutritional management for profitable beef fattening program.
3. Animal health management including deworming, vaccination, sanitation and primary health care should be maintaining.
4. Use of modern farming technology and community involved farm mechanization to reduce labour cost and increase profit.
5. Cooperation among extension people, researcher, farmers, stakeholders and marketing people.

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