**Chapter 1: Introduction**

 Livestock of Bangladesh is an integral part of agricultural farming and agribusiness system. It plays an important role in the agricultural production sphere. Statistics showed that about 2.9% of national GDP is covered by the livestock sector, and its annual rate of growth is 5.5%. About 20% of the population of Bangladesh earns their livelihood through work associated with raising cattle and poultry (Banglapedia, 2015). Cattle farming are an important subsidiary to agriculture and playing a significant role in rural economy in Bangladesh (Hashem *et. al*. 1999). According to Directorate of Livestock Services (DLS), livestock are classified as macro livestock and micro livestock. Here, macro livestock included cattle, buffalo, sheep and goat conversely micro livestock included different poultry species.

 Beef fattening is an emerging sector for employment and income generation for the cattle farmers especially during the period of Eid-al-Adha. It also a great source of industrial income in contest of Bangladesh. Cattle fattening is an effective tool for poverty alleviation for the rural poor farmer in Bangladesh. Small scale cattle fattening is an important avenue for income generation for mainly subsistence farmers in different area of Bangladesh like Comilla District (Rahman *et al*., 2004). During heavy demand of livestock, cattle are usually being imported from the neighbor country like India to meet the demand. However, some rural and commercial farmer carry out fattening programmed year round as a way of their livelihoods, but cattle fattening for beef production get priority of the small scale farmers in Bangladesh during Eid al-Adha (Sabur *et al*., 2000). About 1.8 million cattle are sacrificed at this time each year (Sujan *et al.,* 2011). The livestock resources of Bangladesh are mainly based on cattle, goat, sheep, buffalo, and poultry. Although cattle concentration per unit area is high, their productivity is low mainly due to inadequate feed supply and low genetic potentiality (Pandit, 2005). As a result their growth performance is very poor. Modern technologies, if properly generate through research and adopted in respect of breeding, feeding, management and disease control can raise the production to a much a higher extent(Sujan *et al*., 2011).

However, for better and rapid improvement of animal body within short time farmer uses different types of drug and feed additives like as anthelmintics , probiotics, antibiotics, digestive stimulant, metabolic stimulant, steroids, hormones, liver tonic, amino-acid supplements and both vitamin and mineral supplements. All the supplements help to assist higher body weight, dressing percentage and also in better carcass quality with in short time. On the other hand, in addition to main feed ingredient farmer also practices different kinds of feed supplements like urea treated straw , urea molasses multi-nutrients block and molasses treated straw that enhance the rapid growth and fattening of cattle ( Rahman *et al.,* 2012).

 Among all types of drug both steroid and hormonal product that used in bull fattening, may create long term public health hazard (Jeony *et al.,* 2010). The use of hormonal growth promoters and steroid growth promoters in food-producing animals has provoked many concerns on their human health impacts. Growth promoters including hormonal substances and anabolic steroid are used legally and illegally in food producing animals for the growth promotion of livestock animals (Jeony *et al*., 2010). Both steroid and growth hormones used for growth promotion in food-producing animals have provoked much debate on the safety of livestock products for human consumption. As a consequence of the total ban in the European union (EU) of all hormonal active growth promoters ("hormones") in livestock production, in contrast to their legal use of five such hormones (17beta-estradiol, testosterone, progesterone, trenbolone and zeranol) (Stephany, 2010). In Bangladesh rural condition, Most of the farmers get knowledge about beef fattening from Quack and veterinary field assistant and very minor percentages of people get information from veterinarian. For this reasons, significant number of farmers use different types of drugs like antibiotics, steroid, hormones and metabolic stimulant irrationally.

The information in relation to drug use in cattle fattening by rural farmers in Bangladesh is very limited. Detailed study is needed in different districts of Bangladesh to recommend that available drugs and feed additives used in cattle fattening programs during Eid-al-Adha. There is a great opportunity to develop potential small scale cattle fattening both for satisfying animal protein requirement and production of quality beef for human consumption. For this, it is prime important to find out the beneficial drug and scientific method by avoiding harmful steroids and hormonal drug existing cattle fattening system in Bangladesh.

Therefore, the present study has been undertaken specially,

1. To identify the most common and available drugs used in beef fattening season at the time of Eid-al-Adha.

2. To find out the deleterious drug (Steroid and hormones) that is irrationally used for beef fattening.

3. To investigate the housing system and common feed used for beef fattening.

4. To identify constrains associated with beef fattening.

**Chapter 2: Materials and Methods**

**2.1 Study Area:**

For selecting study area preliminary visits were made to recognize the place where highest number of cattle was reared for fattening. Finally the study was conducted in three Upazilla namely Burichang , Bramnpara and Sadr-Dakhin under Comilla district. The data was collected through face-to-face interview schedule involving 100 respondents of three Upazilla under Comilla District who were involved in cattle fattening before Eid-al-Adha from the period of July to September 2016.

**2.2 Selection of farmers**

The farmers were selected who rear cattle or bought cattle for fattening and were able to give information when necessary. Farmers were randomly chosen from each Upazilla. Therefore, in total 100 farmers were chosen for collecting data to satisfy the specific objectives of study.

**2.3 Preparation of interview schedule**

In order to collect relevant data for the study, a predetermined 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 form of questions. Some parameters were included in the schedule, wherever necessary. The draft interview schedule was pre-tested in the study area. The pre-test facilitated the researcher to identify faulty questions in the draft schedule and necessary corrections and modifications were made on the basis of the pre-test results.

**2.4 Methods of data collection**

Data were collected by face-to-face interview method from respective cattle fattening farmers in respective study area. All type of information and data were collected by the researcher himself before Eid-al-Adha when beef fattening program was continued by the farmers. The researcher first established communication with the farmers and clearly explained the objectives of the study by using local language as far as possible. As a result, the farmers furnished proper responses to the questions and statements without any hesitation. Excellent cooperation was received from the respondents and other people of the study area.

**2.5 Processing of the Primary 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 in Microsoft Excell-2007.

**2.6 Computing and analysis of data**

Obtained field data was stored in Microsoft Excell-2007 and imported to the software STAT/IC-11.0 for analysis. Data were carefully analyzed with a view to fulfill the objectives of the study. Descriptive statistical analysis was done to measure the mean, percentages, Standard error (SE), 95% confidence interval (CI) and p-value of different parameters. The arithmetic means (±SE) of different parameters in different groups were calculated using Paired T-test.

**Chapter 3: Results**

**3.1 Different factors associated with cattle fattening**

 Factors associated with beef fattening by the farmers are shown in Table-1, in this most of the farmers (52%) kept their animals in separate house, whereas, the rest (48%) farmers kept their animal in dwelling house. For beef fattening, maximum number (72%) of cattle reared in confined system and second highest number of cattle reared in semi intensive system (25%) whereas insignificant numbers (3%) are reared in extensive system.

**Table-1:** **Different factors associated with beef fattening**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameters** | **Categories** | **Number of****respondents****(n = 100)** | **Percent of****total respondents** |
| Housing System | Separate housing | 52 | 52 |
| Inside the dwelling house | 48 | 48 |
| Rearing system | Extensive | 3 | 3 |
| Semi intensive | 25 | 25 |
| Confined | 72 | 72 |
| Breed type | Deshi | 46 | 46 |
| Cross | 18 | 18 |
| Both | 36 | 36 |
| Duration of Fattening Program | 3 Months | 72 | 72 |
| 6 Months | 17 | 17 |
| One year | 11 | 11 |
| Sex of animal | Male( bull) | 92 | 92 |
| Female( cow, heifer) | 8 | 8 |
| Number of animals | 1-3 | 70 | 70 |
| 4-5 | 26 | 26 |
| Above 6 | 4 | 4 |

About 36% farmers used both deshi and cross bred bull cattle for fattening, 46% deshi and 18% used cross breed. Most of the respondents fattened cattle for 3 months (72%) and rest farmer fattened prolonged period for 6 months (17%) and one year (11%). About 92% farmersused bull and only 8% used female animal for beet fattening. About 70% farmers had average 1-3numberof cattle for fattening and 26% farmers had average 4-5 number of cattle. Very few (4%) farmers had above 6 cattle for fattening.

**3.2 Application of different groups of pharmaceuticals in beef fattening**

Application of different groups of drug associated with cattle fattening by rural farmer are shown in table 3. About 86% farmers dewormed their cattle before starting the fattening program where as little percentages (14%) of farmer did not practiced any deworming schedule. Major number (82.75%) of farmer deworming practice was done by using broad-spectrum combined anthelmintics rest of the farmer (17.25%) use single anthelmintics for deworming. About 9% respondents Practice vaccine against infectious disease (FMD and Black quarter) regularly for their cattle and conversely 91 % farmers not yet practiced any vaccines.

**Table-2: Different groups of pharmaceuticals used in beef fattening**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameters** | **Categories** | **Number of****farmers****(n = 100)** | **Percent of****Total farmers** |
| Deworming | Practiced | 86 | 86 |
| Not Practiced | 14 | 14 |
| Types of Anthelmintics | Combined drug | 72 | 82.75 |
| Single drug | 15 | 17.25 |
| Vaccination | Practiced | 76 | 76 |
| Not Practiced | 24 | 24 |
| Digestive stimulant | Application | 78 | 78 |
| Not applied | 22 | 22 |
| Metabolic stimulant | Practiced | 61 | 61 |
| Not Practiced | 39 | 39 |
| Steroid | Practiced | 24 | 24 |
| Not Practiced | 76 | 76 |
| Hormone | Use | 4 | 4 |
| Not use | 96 | 96 |
| Liver tonic | Use | 54 | 54 |
| Not use | 46 | 46 |
| Vitamin-B Complex | Use | 41 | 41 |
| Not use | 59 | 59 |
| Amio-acid Supplements | Practices | 48 | 48 |
| Not Practices | 52 | 52 |
| Mineral supplements | Use | 47 | 47 |
| Not use | 53 | 53 |
| Urea molasses block (UMB)  | Practices | 9 | 9 |
| Not Practices | 91 | 91 |
| Urea molasses straw (UMS) | Use | 15 | 15 |
| Not use | 85 | 85 |
| Molasses treated straw (MTS) | Use | 41 | 41 |
| Not use | 59 | 59 |
| Concentrate feed | Feeding | 98 | 98 |
| Not feeding | 2 | 2 |
| Cooked rice | Use | 76 | 76 |
| Not use | 24 | 24 |
| Fermented rice | Use | 12 | 12 |
| Not use | 88 | 88 |
| Treatment | Veterinarian | 31 | 31 |
| Quack( unskilled village doctor) | 39 | 39 |
| Owner | 30 | 30 |

Statistical analysis revealed that about 78% and 61% farmers used digestive stimulant and metabolic stimulant respectively that enhance better digestibility and rapid growth of animals. On the other hands, both 22% and 39% farmer did not use any digestive and metabolic stimulants. Use of steroid hormones as well as of compounds having hormone-like activity has been reviewed from the standpoint of their application to promote growth, fattening and feed utilization. In our present study, it was observed that a very little percentage 24% and 4% of farmer use steroid and hormones respectively for cattle fattening within short time during Eid-ul-Azha. Likewise, for better growth performance of animal significant percentages like 54%, 41%, 48% and 47% of farmers use different kinds of organic and inorganic substances as liver tonic, vitamin-B complex, amino-acid and mineral supplements respectively. Alternatively, rest of the farmer did not use any organic and inorganic substances for fattening.

 In study area respondent farmer fed green grass to their cattle when available. Rice straw was the main feed source in the study areas. In all the three upazillas under study most of the respondent farmer compulsorily bought or store rice straw as their cattle feeds. Chopped rice straw was offered mainly during stall-feeding with adequate supply of water. Many respondents had knowledge on some of the feeding technologies and high quality fodder cultivation. In the study area the respondents found using Urea Molasses Straw (UMS) technology to fatten their cattle which only 15% of the total respondent farmer and only molasses treated straw use 41% farmers were under study. In our study found that 91% farmers do not have any knowledge about urea molasses block (UMB). None of them was found to cultivated fodder crops for this business owing to lack of own land. About 98% farmers regularly supplied the concentrate feed as a animal energy and protein sources, Whereas 76% farmers supplied cooked rice as a concentrated feed and 12% respondents use fermented rice for rapid fattening of cattle. Lastly, it was seen that 31% respondents took help from veterinary surgeon for treatment of their cattle and rest part of farmer (39%) depends on quack( unskilled village doctor) and own treatment.

**3.3 Identified problems faced by beef fatteners:**

 The problems faced by the fatteners in the study area shown in Table 4 shows that about 13.65% reported that there is a high cost in feeding the animals, 10.31% reported inadequate credit to improve their business. About 11.42% of the respondents reported that disease as a threat to the business due to cross border cattle trade without veterinary check up in our country weak enforcement of policies, laws, regulations and standards has led to spread of diseases. Notably, the highest problem was 14.60% reported price fluctuation as a factor that affects the profitability of the business because Indian businessmen were selling cattle on credit. Our businessmen make payment after selling the cattle in Bangladeshi market. About 5.55% of the respondents were of the opinion that higher transportation cost has been a problem affecting business because high toll charge in cattle market. They said that trucks carrying cattle from border areas to different places including Dhaka have to pay tolls at different places. Toll has to be paid to police while the truck crosses a district. Highway police has to be paid separately.

**Table-3: Different problems in cattle fattening**

|  |  |  |
| --- | --- | --- |
| **Problems** | **No. of respondents** | **Percentage** |
| High cost of feeds | 86 | 13.65 |
| Inadequate credit facilities | 65 | 10.31 |
| Disease attack | 72 | 11.42 |
| Price fluctuation | 92 | 14.60 |
| Higher transportation cost | 35 | 5.55 |
| Lack of extension services | 58 | 9.20 |
| Shortage of cattle feed | 82 | 13.01 |
| High cost of labour | 40 | 6.34 |
| Lack of knowledge about fattening | 22 | 3.49 |
| Inadequate veterinary service | 78 | 12.38 |

The respondents mentioned, lack of extension service as reported by 9.20%, Shortage of cattle feed by 13.01%, high cost of labour about 6.34% and 3.49% reported lack of knowledge about fattening. Inadequate veterinary service also a crucial point in study area. Here, about 12.38% farmers do not get treatment facilities regularly and most of the farmer dependent on unskilled village Quack.

Price fluctuation (14.60%), high cost of feeds (13.65%) and shortage of cattle feed(13.01%) constituted the major problem to cattle fattening in the study area. Similarly, inadequate credit could be as a result of lack of collateral which has made it almost impossible for them to access of credit from the bank. The feed for livestock is a chronic problem for char dwellers. Ali and Anwar (1987) is corroborated by the finding of present study, shortage of animal feed was the greatest problem of the farmers for rearing cattle. Hashem et al. (1999) also reported that lack of training, lack of credit facilities, price variation in different markets, disorganized marketing system were the problems for beef fattening in Bangladesh. About 81% farmers had the problem of transporting cattle for in the study area.

**Chapter 4: Discussion**

Indigenous cattle (*Bos indicus*) are reared by the farmer of Bangladesh mainly getting draught power, milk, calves and meat. Cattle fattening for beef production has become important business of the small farmers in Bangladesh. 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-al-Adha (Muslim festival) and then they are fattened and sold during the Eid-al-Adha festival. There is little information available on cattle fattening by the rural farmers. Hossain ( 1986) worked on management systems of cattle regarding feeding, housing, rearing system, disease prevention and marketing in the comilla district. Hossain *et al.,* (1996a) conducted a study on beef fattening in the Manikganj district. Haq *et al.,* (1997) reported that the farmers were benefited highly by selling fattened cattle before Eid-al-Adha in the Mymensingh district. One of the advantages of the cattle by the rural farmer is that they use locally available cattle feed resources. Indigenous knowledge on cattle fattening (Rahman *et al.,* 1998) Practiced by the rural livestock farmer of Mymensingh district of Bangladesh were found. It is closely similar in our present study that majority of farmer practiced indigenous knowledge for cattle fattening.

In our study found that most of the farmers (52%) kept their animals in separate houses, whereas the rest 48% farmers kept their animals in dwelling house. The result of this study was in agreement with Hossain *et al.,* (1996a) where they reported that keeping cattle for fattening purpose in separate house by majority of the farmers were cited. Extensive, semi-intensive and confined production systems were practiced reported by the respondents for cattle fattening. . Extensive system consisted of grazing their own croplands after harvesting crops and grazing on roadside grasslands. Semi-intensive system included cut and carry and stall-feeding system. During rainy season (March to August) rice straw, green grass, mustard oil cake, wheat bran, rice polish and molasses on the other hand during dry season (September to February) rice straw, green grass, mustard oil cake, wheat bran, rice polish, molasses, tree leaves, weeds and kitchen waste were used by the respondents. Rice straw was the main feed source in the study areas. In all the three upazillas under study most of the respondents compulsorily bought rice straw as their cattle feeds. For cattle fattening most of the farmer (72%) reared the cattle in confined system. The result of present study was similar with Baset *et al.,* (2002). The respondents have 46% Deshi, 18% cross and 36% was both of Deshi and cross in our present study which not similar with previous study of Rhman *et al.,* (1998).Hashem *et al.,* (1999) investigate the cattle fattening program of rural farmers in different district of Bangladesh through field survey. About 90.4% farmers used bull and only 5.2% used females. About 71.20% farmers had an average of 2 cattle for fattening and 28.8% farmers had an average of 3 cattle. In this study about 89% respondents found that the fattening period of cattle suitable was 3-6 months before Eid-al-Adha. While working with the farmers in rural areas of Bangladesh, Hossain, (1986) and Hossain *et al.,* (1996a) reported cattle fattening periods of 4-5 months and 5.7 months, respectively. It is more or less closely related in our present study.

From this study 82% fasrmer reported that feeds are not available for small scale cattle fattening. The result of this study was in agreement with Rahman *et al.,* (2001) where 70% respondents reported that feeds are not available. One of the advantages of the small scale cattle fattening by the rural respondents is that they used locally available feed resources. Distribution of farmers according to their feeds is available for small scale cattle fattening differ significantly. Family members of the respondents are involved in feed processing and offering feed daily to the cattle.

 No improved feeding technologies, such as urea treatment of straw and Urea Molasses Block (Hossain *et al.,* 1996b) supplements were used by the farmers. Although some farmers were trained but they did not follow this technology because they seemed that it was difficult and time consuming them to follow. Indigenous knowledge on cattle feeding like chopping of straw, mixing of straw with molasses, feeding tree leaves etc (Rahman *et al.,* 1998) practiced by the rural farmers of Comilla was more or less same to the feeding practices of this study. Many respondents had knowledge on some of the feeding technologies and high quality fodder cultivation. In the study area the respondents found using Urea Molasses Straw (UMS) technology to fatten their cattle which only 15% of the total respondents were under study. None of them was found to cultivated fodder crops for this business owing to lack of own land and knowledge.

Out of 100 farmers, 86% farmer dewormed their cattle with broad-spectrum combined anthelmintics 76% used vaccine against infectious disease (like Foot Mouth Disease, Black Quarter) regularly for fattening cattle. The result of this study was closely similar with Begum *et al.,* (2007) where they reported that 83.3% farmers used vaccination for beef fattening.

 Both metabolic stimulant and digestive stimulant used for growth promotion in food-producing animals. Some unscrupulous cattle farmers are used human drugs to fatten up cattle ahead of the holy Eid-ulAzha but it is a cause serious health hazards and even an unusual death of the cattle. They used human drugs of steroid group like 'Decason' tablets of Dexa-methasone for cattle rapid fattening before the Eidul-Azha as earning windfall profit. Cattle traders also used steroid tablets and hormone injection for cattle fattening in order received high profit .It was harmful way of cattle fattening may cause death of the cattle after a certain time and meat consumption of cattle is also hazardous for human health. because farmers are fed cattle about 2 to 4 tablets up to selling and it creates unusual pressure on the kidney and different organs the drug slowly affects the normal circulation of urine of the animal, within few days the cattle looks fat when the urine comes to its whole body (Jeong *et al*., 2010) . In our present study, it also revealed that 24% farmers used steroid for fattening within short times during Eid-ul-Azha. Many farmers use different types of organic and inorganic substances like vitamins and minerals (Stephany, 2010) for better growth of animals. It is closely similar with our study, in our study area farmers use liver tonic, Vitamin-B complex, amio-acid and minerals supplements. Concentrated feeding for cattle fattening commonly practiced throughout the world (Rahman *et al.,* 2004). Concentrated mainly consist of wheat bran, rice bran, oil cakes, pulse bran, molasses, cooked rice and some cases fish meal. In our study revealed that 98% farmer used concentrated feed and 76% farmers used cooked rice for cattle fattening which is closely similar with (Saadullah and Hossain, 2000) study.

The result of this study (Table -3) shows that 92 respondents mentioned that the greatest problem for small scale cattle fattening and mentioned about Price fluctuation of cattle. The result of this study differed from. Ali and Anwar, (1987) and Hossain *et al.,* (1996b) where they found that shortage of animal feed was the greatest problem of the farmers for rearing cattle. Hashem *et al*., (1999) also reported that lack of veterinary service, lack of credit facilities, price variation in different markets, disorganized marketing system were the problems for beef fattening in Bangladesh.

**Limitations**

Number of data (N=100) was not sufficient for an efficient study due to short time. The data were collected only for 3 months (July to September) in the year but it would be better to conduct the study throughout the year. The study area was also a limited range where as it might be better to include all the Upazilla under this district. Data was collected only by using close formed questionnaire for this reasons there was less chance to adjunct additional information. Risk factor analysis was not included in this study during data collection. Finally, the adverse effect of steroid and hormonal drugs upon public health not yet mentioned in this study.

**Conclusion**

This experiment was conducted to find out the existing production system of cattle for beef production. In Bangladesh beef fattening could play a significant role in poverty elevation, in the creation of employment opportunity and animal protein supply. It is essential to supply cheap and nutritionally balanced diet to maximize the growth of beef cattle. Improved feeding technology like urea molasses straw (UMS) and urea molasses block (UMB) should be extended for efficient utilization of fibrous feed. In addition, different types of beneficial drugs like digestive stimulant, metabolic stimulant, liver tonic, vitamin and mineral supplements enhance the rapid growth of food animals with in short time. Conversely, the drugs like antibiotics, steroid and hormones that create potential public health hazard must be avoided in future time and it is essential to establish an act by the government for application of drug in food animals. However, as Muslim country beef cattle enterprise has a great prospect in Bangladesh. Not only in Eid-ul-Azha but also it has good demand throughout the country in any time.

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**Biography**

This is Eaftekhar Ahmed Rana, from Comilla , son of Md, Abdus Satter and Mst. Lipi Akter. I have completed my Secondary School Certificate from Bharashar High School and Higher Secondary Certificate from Sonar Bangla College in 2008 and 2010 respectively with CGPA 5.0 out of 5.0 Scale in both exams under Comilla board. As a successful candidate for DVM degree, I have achieved CGPA 3.93 out of 4.00 in the taught courses/ in-campus study placing myself in the 1st position. Now I am enrolled in the Year long Internship program. In future, my immense of interest is toward the higher study and research in the field of Veterinary Medicine.