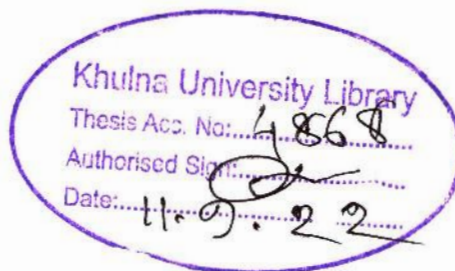


Identification of Hormone Use Pattern in Beef Fattening in Southwest Coastal Regions of Bangladesh

**A Thesis
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DEDICATION

This thesis is dedicated to my parents,
For their endless love, support and encouragement.

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Date: March, 2022

The Author

ABSTRACT

The study was conducted to identify of hormone use pattern in beef fattening program in three upazilas under three different districts of Bangladesh. Data were collected from ninety (90) respondents involved in cattle farming through survey using questionnaire. Socio-economic characteristics of the respondents (cattle farmers) were also studied. The results indicated that, the majority (61.1%) of the respondents was middle aged, 21.1% old aged and 17.8% was young aged. In case of the level of education of the respondents, 46.7% had Secondary level of education, followed by Graduate or above (15.6%), Illiterate (12.2%), Primary (12.2%), higher secondary (11.1%), and 2.2% sing up only. The majority (57.8%) of the respondents belonged to high income group followed by medium (26.7%) and low annual income group (15.6%). About 18.9% of the respondents had marginal farm size, 24.4% small, 8.9% landless, 27.8% medium and 20% had high sized farms. The average farming experience of the respondents of Dumuria upazila was higher than other upazilas under study (about 19.5 years). The average cattle farming experience of the respondents of Tala upazila was higher than other upazilas (about 18 year). About 21.1% of the respondents had no farming experience and 53.3% had long term experience of farming. Majority of the respondents (48.9%) long term experience in cattle farming followed by medium (32.2%) and short-term experience on cattle farming (18.9%). Majority (64.4%) of the respondents belonged to high annual income from cattle rearing group followed by medium annual income group from cattle (23.3%) and low income (10.0%). Average 58.9% of the farmers took no training on beef fattening and 41.1% had taken short-term training on beef fattening. Majority of the respondents (87.8%) had medium knowledge about cattle rearing, 3.3% had low, and 8.9% had high knowledge.

Majority of the respondents (66.7%) showed medium positive attitude and 33.3% described as high positive attitude to beef cattle fattening. Most of the respondents (71.1%) purchased cattle for fattening purpose at any time of the year, 20% purchased occasionally and 8.9% rear their own cattle. About 40% respondents sold their cattle during Eid-ul-Azha, 33.3% round the year and 26.7% sold their cattle both at any time and Eid. About 53.3% respondents practiced fattening for more than 1 year, 38.9% fattened 9-12 month, 5.6% for 3-5 month and rest 2.2% fattened their cattle for the period of 6-8months. Most of the respondents (90%) vaccinated their cattle regularly, 5.6% occasionally and 4.4% didn't vaccinate their fatten cattle. Majority (63.3%) of the farmers rearing or chose crossbred for fattening purpose and rest 36.7% chose indigenous or deshi cattle for fattening. Majority of the respondents (58.9%) purchased their cattle for fattening and rest 41.1% farmers used their own cattle for fattening. The results revealed that 82.2% respondents practiced artificial breeding method, 13% both natural and artificial methods and 4.4% practiced natural method. Majority of the respondents (87.8%) treated sick animals by local doctors and rest 12.2% by veterinarian. Most of the respondents (96.7%) did not keep any records, 3.3% kept records to their cattle. Among the beef cattle farmers under study, 84.4% was male and 15.6% was female cattle farmers. Average 41.1%

respondents visited upazila livestock offices very rarely, 23.3% occasionally, 2.2% visited frequently and 33.3% didn't visit livestock office. Most of the farmers (83.3%) faced moderately problem followed by highly (15.5%) and low problems (1.1%) during cattle farming. Majority of the farmers (63.3%) didn't use any hormones for their fattening purpose and rest 36.7% farmers used growth hormones. Most (87.8%) of the respondents used antibiotics as growth promoter for fattening cattle and 12.2% didn't use it. Majority of the farmers (97.8%) did not feed urea molasses straw (UMS) to their fatten cattle and only 2.2% farmers fed UMS to the fatten cattle. It can be concluded that a moderate number of farmers applied hormones and large number of farmers applied antibiotics for beef cattle fattening purpose in the studied areas which is alarming to the public health.

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Abbreviation

FDA= Food and Drug Administration
FAO= Food and Agricultural Organization
WHO=World Health Organization
MAFF= Ministry of Agriculture, Forestry and Fisheries
DLS=Department of Livestock Service
US= United States
USA= United States of America
EU= European Union
DES=Diethylstilbestrol
IARC=International Agency for Research on Cancer
HGP=Hormonal Growth Promotant
UMS=Urea Molasses Straw
UMB=Urea Molasses Block
BLRI=Bangladesh Livestock Research Institute
UK= United Kingdom
AIS=Agricultural Information Services
BVA=British Veterinary Association
LSU= Louisiana State University
BVJ= British Veterinary Journal
BJAS= Bangladesh Journal of Agricultural Science
SAARC= South Asian Association of Regional Cooperation
BARC= Bangladesh Agricultural Research Council
IJSR= International Journal of Science and Research
SPSS=Statistical Package for the Social Science
JAFE= Journal of Agriculture Food and Environment
IBM= International Business Machine Corporation



SD= Standard deviation

Physio. =Physiological

Bang. = Bangladesh

Res. =Received

Rev. =Review

Int. = International

J. = Journal

Anti. =Antimicrobial

Adv. =Advance

Anim. = Animal

Sci. = Science

et. al, =Associates

Introduction

1.1 Background of the study

Bangladesh is an agricultural country where livestock production is the part of agricultural activity. Beef production is an important part of the national economy with important contribution to local market. Production of beef and buffalo meat was at level of 196,134 thousand tons in 2019, up from 195,333 thousand tones previous years, this is a change of 0.41% (Bangladesh production of beef, 1996-2020). Cattle fattening for beef production has become an important business of the small farmers in Bangladesh. 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. Beef fattening is an emerging sector for employment and income generation for the rural, poor, especially landless, destitute and divorced women (Hossain 1986, Hossain *et al.*, 1996, Huq *et al.*, 1997, Hashem *et al.*, 1999).

The cattle fattening technology was developed in Bangladesh Livestock Research Institute (BLRI) on the basis compensatory growth theory to support the traditional cattle fattening, farmers of this country for employment and income generation (Rashid *et al.*, 2016). In Bangladesh feed additives and growth promoters imported by pharmaceutical industries and overseas marketing agencies and attract farmers to use them in fattening animals. Most of the cattle brought for sale as sacrificial animals during Eid-ul-Azha, are fattened allegedly by unscrupulous cattle traders ignoring the scientific formula prescribed by livestock department for rapid live weight gain and quick profits (Islam *et al.*, 2012). In Bangladesh, locally and globally banned steroid hormone, use of these steroid hormones in animals are prohibited in the country according to Animal Feed Act 2010. A kind of steroid for rapid fattening of the sacrificial animals in short days before the Eid as they are out to earn extra profit from cattle business during the festival, Kidney and liver of the cattle don't function properly if animals are feed with the banned drugs (Shahriar, 2015). Under this unscientific fattening method, an animal if feed with 20 to 25 tablets and it creates abnormal pressure on kidney and other organs as the drug slowly affect the normal circulation of urine, adding that within a few days the cattle look fat (Shahriar, 2015).

In Scientific cattle fattening method, the cattle are to feed right proportion of Urea Molasses and Straw (UMS) daily. Above six months aged cattle can utilize the right quantity of urea properly to accelerate its growth without contamination of meat (Kamal *et al.*, 2019). In the majority of villages in Bangladesh, farmers rear beef cattle for fattening without having any scientific knowledge. Some drugs /steroids are being used for fattening purposes which are prohibited as per feed act of Bangladesh. Farmers are not getting proper training on production and management practices of beef cattle fattening. Farmers need proper knowledge on different contaminations in cattle feed for produce quality and safe beef (Kamal *et al.*, 2019).

1.2 Statement of the Study

Identification means the act of identifying or the state of being identified (Dictionary, 2016). The intention of the study about identification of hormone use pattern in beef cattle fattening is to find out illegal use of hormone. Beef fattening is comparatively easy for the farmers because it requires a less investment. Besides, this it does not require a lot of space (if reared in a small range) so that farmers can conduct beef fattening program in their homestead area. Beef can take feed on themselves in the roadsides and concentrate, so farming of beef cattle fattening is not time consuming and farmers can maintain beef in additional to agricultural work. It may create the opportunity of extra income and play role in improving their socio-economic condition and lifestyle.

The researchers had undertaken research entitled “Identification of Hormone use pattern in Beef Cattle Fattening in southwest coastal Regions of Bangladesh”. This research was formulated to seek answers of the following questions considering beef fattening in southwest coastal regions of Bangladesh.

- What is the scope of beef cattle fattening in coastal region?
- How beef cattle farmers use hormones in beef fattening?
- What are the characteristics and socio-economic conditions of beef cattle farmers?
- Are there any benefactions of beef fattening in improving farmers economic condition?
- What problems may be found during fattening beef cattle?

1.3 Objectives of the study

Particular objectives of the study are given below:

1. To study the use pattern of hormones in beef cattle fattening in southwest regions of Bangladesh.
2. To study the socio-economic conditions of beef cattle farmers in southwest regions of Bangladesh.
3. To identify the problems and prospects of beef cattle fattening program in southwest regions of Bangladesh.

1.4 Justification of the study

For betterment of economic status of beef fattening, our Government and some Non-government organization take on some projects, give loans, training etc. but the outcome of these attempts will be found when the rural jobless, landless people and farmers will be interested in beef fattening program. Accordingly, this research was undertaken to show the present condition of beef fattening program in Bangladesh, especially in the south-west region and to find-out the scopes and problems.

1.5 Scope of the study

The results of the study would provide useful knowledge and data to the personnel, researchers, planners and field workers concerned with beef fattening in southwest region. The finding of the study would helpful to make plan of projects, training and loan opportunity for the jobless, landless or marginal rural farmers and thus there may create an additional income source for them which lead to development of their economic condition.

1.6 Limitation of the study

Most of the respondents in this study area were illiterate, they did not keep any records on cattle fattening. They even don't have knowledge about impact or effects of hormones and antibiotics on human health. Most of the respondents did not vaccinate regularly and did not separate disease infected cattle from other healthy cattle. Some respondents were middle and old aged so they could not deliver right data and information. There are also lack of training facilities and limitations of knowledge about beef fattening. They called unskilled village doctor for treatment of sick cattle. The respondents are used traditional fattening system or unscientific fattening method. They don't know about scientific cattle fattening technology and they even don't familiar to the use of UMS.

CHAPTER II

REVIEW OF LITERATURE

This chapter is designed for critically reviews for comparing past studies about beef fattening to the present study. The literature review would help conduct the research in proper way and it brought about the recent information on this field. Under this chapter i have discussed the findings of different researchers related to my study.

A large number of farmers involved in beef fattening just before 3 or 4 months of Eid-ul-Azha (Muslim festival) when they sell the animals with profit (**Baset *et al.*, 2003**).

In beef cattle producer use variety of steroid hormones to make animals grow faster, convert their food into muscle more efficiently and make their meat leaner. The residues of added hormones in meat could disrupt normal hormone function in humans, especially developing children potentially increasing the risk of problem such as reproductive abnormalities (**FDA, 2021**).

Cattle producer used antibiotic to increase growth rates and improve overall efficiency and product quality (**Mebrate *et al.*, 2020**).

The Technology of feeding Urea Molasses Straw (UMS) to treatment in beef cattle resulted higher body weight, dressing percentage and also in beef carcass quality than of untreated straw. In few areas of Bangladesh has already used Urea Molasses Straw (UMS) in beef production and there had no adverse effect on human health (**Baset *et al.*, 2003**).

2.1 Use of hormones in beef production

Ahmed *et al.* (2010) stated that most of the respondents (79.1%) fattened cattle for 3 to 6 months and rest of them fattened for prolonged period. About 79.5% did not have any training on cattle fattening whereas 20.5% respondents had taken short training on cattle fattening, 63.7% respondents used cattle fattening tablets, 27% respondents used Urea Molasses Straw (UMS) and 51% followed conventional feeding.

Hunter (2010) stated that in cattle, natural and synthetic hormones may be implanted under the skin in the middle third of the back of the animal's ear to improve daily weight gain, feed

conversion and carcass quality. HGP (Hormonal Growth Promotant) commonly used include trenbolone acetate and estradiol benzoate, it has the effect of increasing the rate at which muscle grows by about 10-30% and reducing the time the animal needs to spend on feed before reaching slaughter weight.

Hayes (2002) stated that, in the United States, Canada Australia, and New-Zealand and in some countries in South America, Asia and Africa the natural hormone and the synthesis hormone can be used to promote growth in beef production.

Kamal *et al.* (2019) stated that 64% of the livestock farmers practiced fattening round the year and rest of the respondents followed fattening period of 3 months before Eid-UI-Azha and 59% of the respondent applied steroid as growth promoters in beef cattle fattening. The application of steroid (dexavet, pendnivet, gludex) by the farmers was due to the lack of their knowledge on steroids use in livestock. The study indicated that, the respondents owned to the lack of knowledge on steroids use in livestock over public health and the respondents were influenced by the vendor for quick profit.

Rahman *et al.* (2012) stated that, the most of the respondents fattened cattle for 3 months (44.7%) and rest of them fattened for 6 months or one year. 34.7% farmers used beef fattening tablets and rest of them used anabolic steroid as a growth promoter.

Rahman *et al.* (2013) stated that 44.7% respondents are fattening beef for 3 months. About 57.3% respondents had taken short training on beef fattening whereas 42.7% did not take any training on beef fattening. Average 34.7% respondents used beef fattening tablets, 28.0% Urea Molasses Straw (UMS) and 26.7% used Urea Molasses Block (UMB) in beef fattening.

Sobhan (2014) stated that, the harmful steroids are being used in Bangladesh for cattle fattening. The traders are cutting long process short with the help of harmful drugs. The safe methods are ignored for slow results, 63.7% farmers are using drugs for cattle fattening. If consumed such meat may cause cancer and kidney disease. Fattened beef causes infertility in women.

2.2 Use of antibiotics use in beef production

An antibiotic is an agent that either kills or inhibits the growth of microorganism. Antibiotics also known as antimicrobials, these are medications that fight against bacterial infections.

More than 40% of all antibiotics used in U.S. are given to farm animals. The widespread use of antibiotics can lead to the development of antibiotic-resistant “super-bugs” which are a growing threat to human health (Dorland, 2010).

British Veterinary Association (2019) stated that antibiotics are an important tool to treat animal as well as human disease, safeguard animal health, welfare and support food safety.

Bengtsson and Greko (2014) reported that the use of antibiotics in agriculture must be more carefully scrutinized for both human and animal health reasons. It is unlikely that any new antibiotic classes will be developed in the area of veterinary medicine, with research focusing instead on human health, through encouraging greater care to prevent disease in the first place and in limiting the use of antibiotics to more judicious treatment of infectious disease.

Barton (2000) stated that, the resistance to antibiotics is one of the most serious global medical problems as we enter the 21st century. Medical authorities are already confronted with infection for which no antibiotics are effective because the causative bacteria have acquired resistance to all available antibiotics agents. One of the issues receiving close attention at the moment is the link between use of antibiotics in animals and the development of resistance in human pathogens. There is evidence that resistance in some human enteric pathogens has arisen because of transfer of resistant bacteria or resistance genes from animals to people via the food chain.

Canadian Cattlemen’s Association (2003) reported that Canadian Food Inspection Agency enforces standards which protect consumers by ensuring that food will not contain antibiotics at a level which will cause harm to consumers.

Navarre (2020) regulated that many of the antibiotics used in cattle feed are not important in human medicine banning the use of antibiotics in animal feeds can cause increased suffering in animals and many necessitate the increased use of antibiotics that are important for use in people.

Millen et al. (2011) reported that Brazil is the World’s largest exporter of beef. The government regulates antibiotic use in the cattle production industry.

Kegley et al. (1991) reported that global agricultural antibiotic usage will increase by 67% from 2010 to 2030.

Wierup (2001) reported that Sweden banned all use of antibiotics for the purpose of growth promotion of feed animals.

2.3 Hormone and antibiotics residues in beef

Growth Promoters (hormones, antibiotics) have importance for cattle production; the final consumer can be affected by different adverse effects like- drug resistance, carcinogenic effects and potential pathogens. For this reason, antibiotic and hormone that are also used in human and generally illegal use of a large variety of growth promoters should be terminated or controlled unless and until risk assessments are carried out countries should develop policy on the use of different hormone and antibiotic (**Herago and Agonafir, 2017**).

The hormone residues in meat results into adverse effect on human health such as disrupt in human hormone balance, causing developmental problems, interfering with the reproductive system and can even lead to the development of breast, prostate or colon cancer (**Galbraith, 2002, Ganmaa and Sato, 2005**).

Antibiotic resistance is a global public health crisis. According to the Centers for Disease Control and Prevention (CDC), antibiotic resistance is responsible for 25,000 annual deaths in Europe and 23,000 annual deaths in the U.S. (**Sandoiu Ana, 2018**)

2.4 Antibiotic residues

Antibiotic are illegally used for growth promotion in beef cattle production in many countries. Human health can either be affected directly through residues of an antibiotic in meats, which may cause side effects or indirectly through the selection of antibiotic resistance determinants that may spread to a human pathogen (Barza, 2002).

Bogarard and Stobberingh (2000) stated that, the human health concern is the risk of direct transfer of resistant human pathogens or transfer via the food chain. Antibiotics resistance gens may be transferred from animal pathogens or commensals to human pathogens.

Gassner and Wuethrich (1994) had demonstrated the presence of chloramphenicol metabolites in meat products and limited the presence of these antibiotic residues in meat with the occurrences of aplastic anemia in humans cannot be ruined out.

Kyuchukova (2020) reported that use of antibiotic to feed animals for treatment prophylaxis and as growth promoters results in deposition of their residues in animal products. Consumption of these residues through animal products may cause development of antimicrobial drug resistance, hypercreativity reaction, carcinogenicity, mutagenicity, teratogenicity, bone marrow depression and disruption of normal intestinal flora.

Lee *et al.* (2001) reported that there are two adverse effects from the presence of residues of antibiotics in food of animal origin in terms of human health. The first hypersensitive (immunological, allergic) reaction, immunological reaction may range from a weak reaction such as rash to direct life-threatening as anaphylactic shock. The second type of negative impact is the development of antibiotic resistance.

Nisha (2008) reported that the adverse consequences of the presence of antimicrobial (antibiotics) residues on the consumer that is transfer of antibiotic resistant bacteria to the human immune pathological effects, autoimmunity, carcinogenicity, mutagenicity, nephropathy, hepatotoxicity, reproductive disorders, bone marrow toxicity and allergy.

Swann (1969) stated that the adverse effects of using antibiotics to human health were first received worldwide.

WHO (1998), MAFF (1998) reported that the probable hazards to human health's are from feeding low therapeutic levels of antibiotics to food producing animals. The committee recommended that antibiotics for growth promotion used should be restricted to compounds, not used therapeutically in man or animals and which did not select for resistance to such compounds.

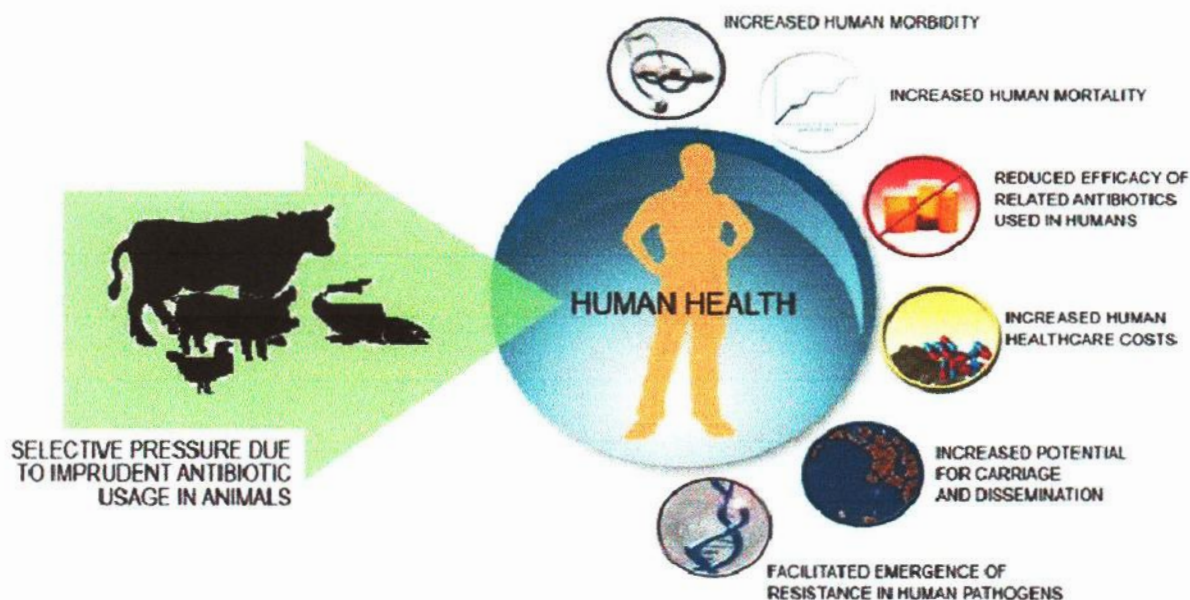


Figure: 2.1 Human healths Impact of antibiotics

2.5 Effects of hormones residues on human health

Al- Dobaid (2009) reported that residue of hormones in meat and meat products of treated animals may pose a risk to the consumer. The adverse effects of hormones include developmental, neurological and carcinogenic effects.

Anonymous (2014) reported that steroids are known immune-suppressor which reduces natural defense mechanism of the body. The residual hormones are linked to an increased risk of breast, colon, prostate and lung cancer in human.

Barry (1999) reported that European Union Scientific Committee show that a growth hormone used in U.S. cattle production is a complete carcinogen and warned that other hormones could cause a variety of health problems.

Colborn *et al.* (1996) stated that there is clear evidence that the hormones originating outside the body can interfere with our own hormone. For example- estrogen classified by the (IARC) as group 1 human carcinogen.

Grandjean *et al.* (2008) stated that fetuses, infants and children are thought to be more vulnerable, to the hormone- disrupting effect of hormone. A recent consensus reviewed the robust and growing body of science that exposure to environmental chemical especially in utero, can disrupt normal hormone function and alter child development, fetal programming and the risks for hormone related cancer or other chronic disease later in life.

Galbraith (2002) reported that the adverse effect of hormones residues in meat to potential for interference with growth, development and physiological function of the consumers.

Hohls and Stan (1978) reported that a hormone implants and their potential toxicity and concluded that elevated levels of hormones in meat from implanted cattle might present a hazard particularly to children.

Keeffe (1984) reported that beef in Ireland also demonstrated that residues levels of Zeranol and Trenbolone were <0.05 mcg/kg in all sample.

Wayne (2013) reported that the potential increase in the risk of getting cancer, synthetic hormones has also been linked to various other conditions. Several occurrences of the early onset of puberty, males growing breast and reproductive problems have all been traced back to synthetic hormones in beef.

Passantino (2012) reported that the many countries around the world such as – Italy, Denmark and Germany who has completely banned the use of hormones in meat production starting in the early 1960.

Smith (1994) reported that chemical residues in beef from cattle slaughtered in the U.S.A in 1990 and Zeranol Nor-trebolone was present in detectable levels.

Swan *et al.* (2007) stated that sperm concentration of male offspring was found to be inversely related to their mothers self-reported beef consumption while pregnant.

Tasci (2014) stated that diethylstilbestrol (DES) has been banned in several countries such as USA in 1979 and EU in 1981.

WHO (1997) reported that hormone residues can adversely affect the immune system and can lead to an increase in certain common cancer. It also affects many aspects of human development and reproduction.

Yang *et al.* (2014) reported that DES (diethylstilbestrol) has mutagenic, carcinogenic and erotogenic properties, which have raised widespread public health concern.

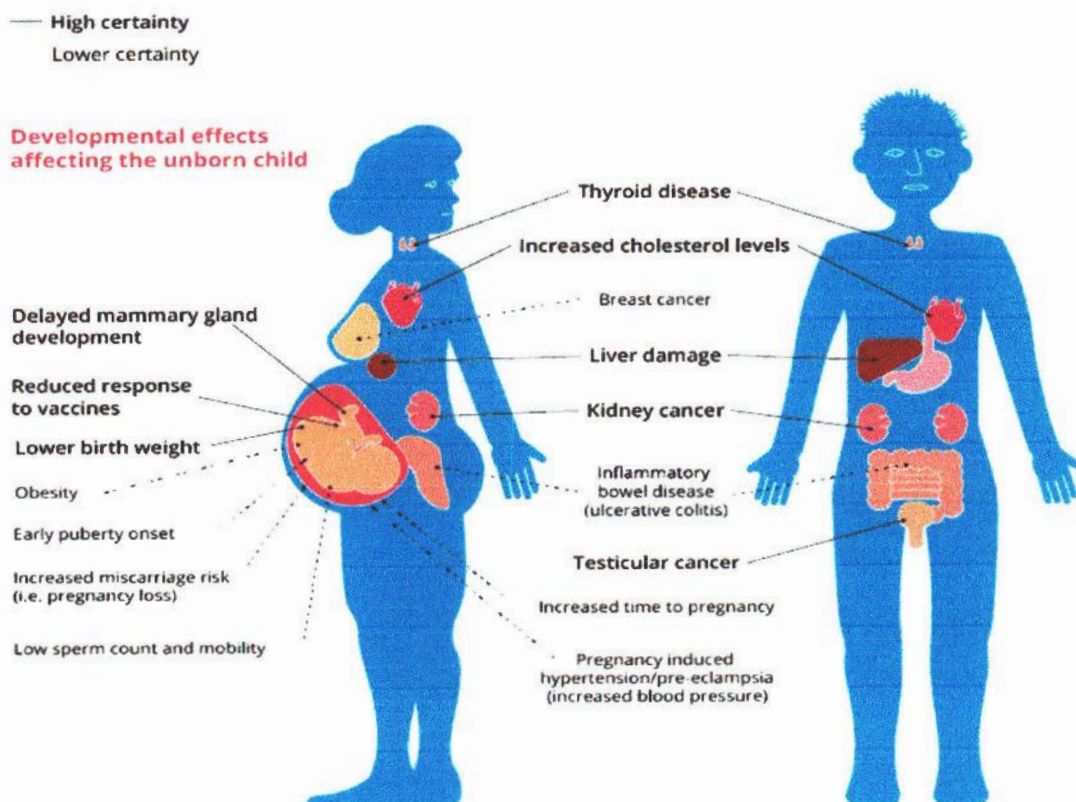


Figure: 2.2 Effect of hormone in human health



CHAPTER III

METHODOLOGY

Methodology of research is the specific techniques that used to identify, process and analysis information about a specific topic. Methodology may be understood as sign of studying how research is done (Kothari, 1990).

The present study was a field survey on “Identification of Hormone Use Pattern in Southwestern Costal Region of Bangladesh”. The data was collected according to a pre-tested interview schedule from the cattle farmers. The interview schedule was prepared very carefully to meet the objectives of the study. All the methods and procedures which were followed in this research are discussed in this chapter.

3.1 Design of the study

The present study was done by face-to-face interviewing of the respondents and collection of data from them. It was designed to study hormone use pattern in southwestern costal region of Bangladesh.

3.2 Sampling of the respondents

The study was conducted at some selected areas that had large number of cattle farmers which helped complete the survey successfully. Thirty (30) farmers who were associated with beef fattening and ready or available to provide information were selected randomly from each upazila and total ninety farmers were interviewed.

Table 3.1: Sampling of the respondents

Sl. No.	Name of Upazila	No. of Farmers (Respondents)
1	Dumuria, Khulna	30
2	Tala, Satkhira	30
3	Fakirhat, Bagerhat	30
Total		90

3.3 Location of the study

The study was conducted in three upazilas of southwestern coastal region of Bangladesh. These were Dumuria of Khulna, Fakirhat of Bagerhat and Tala of Satkhira districts which were selected randomly.



Figure 3.1 Map of Khulna District



Figure 3.2 Map of Dumuria Upazila

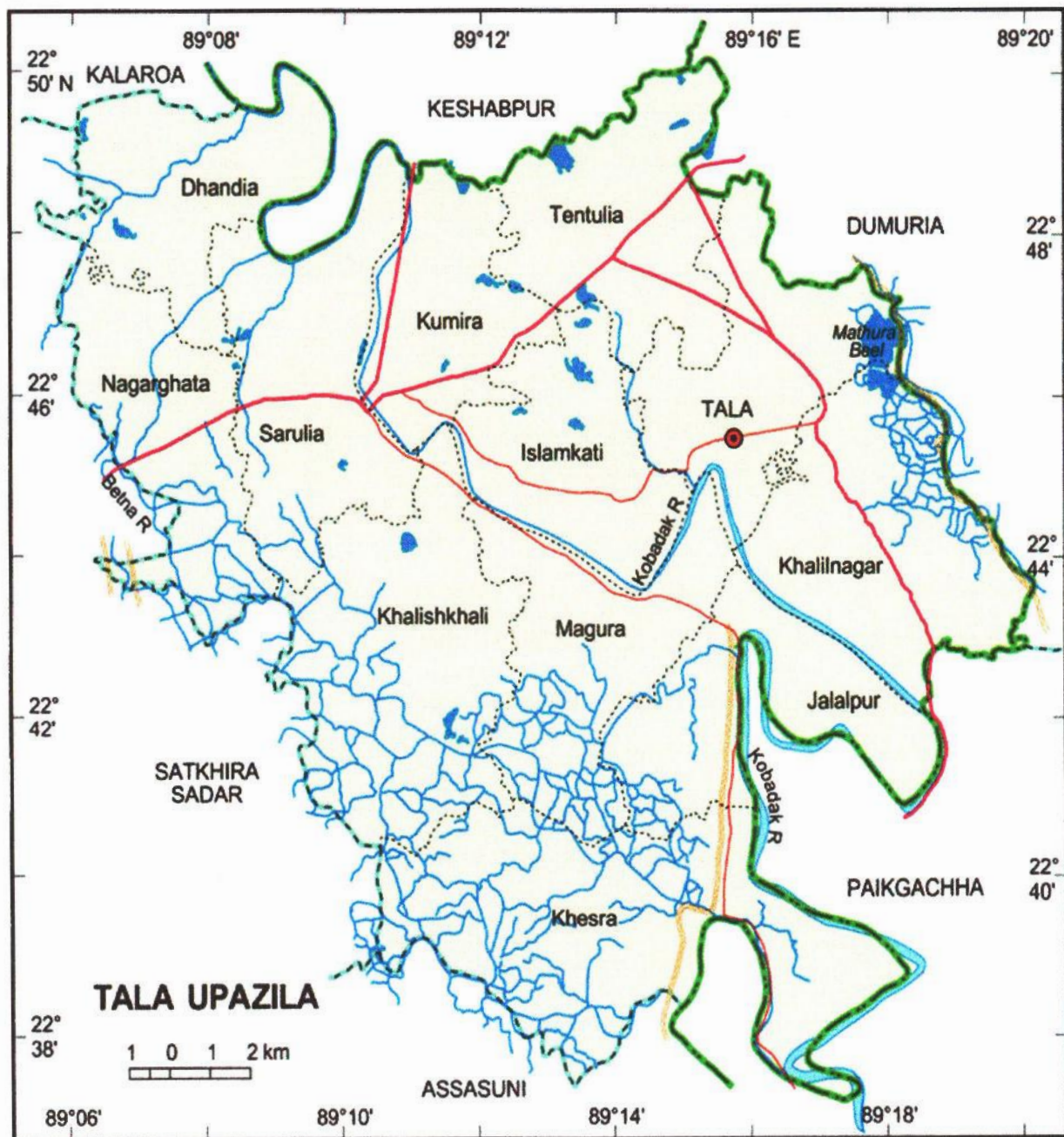


Figure 3.3 Map of Tala Upazila

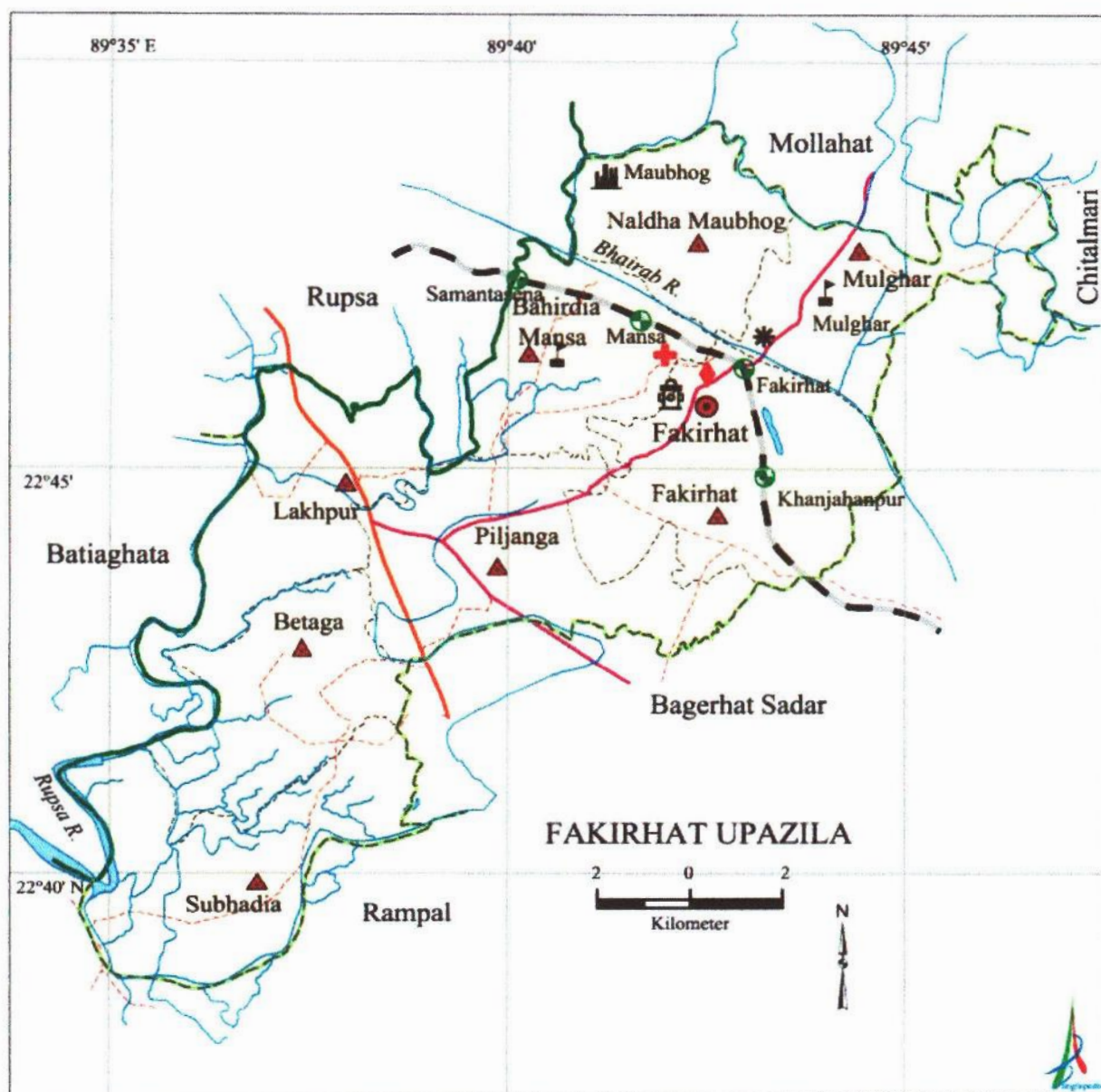


Figure 3.4 Map of Fakirhat Upazila

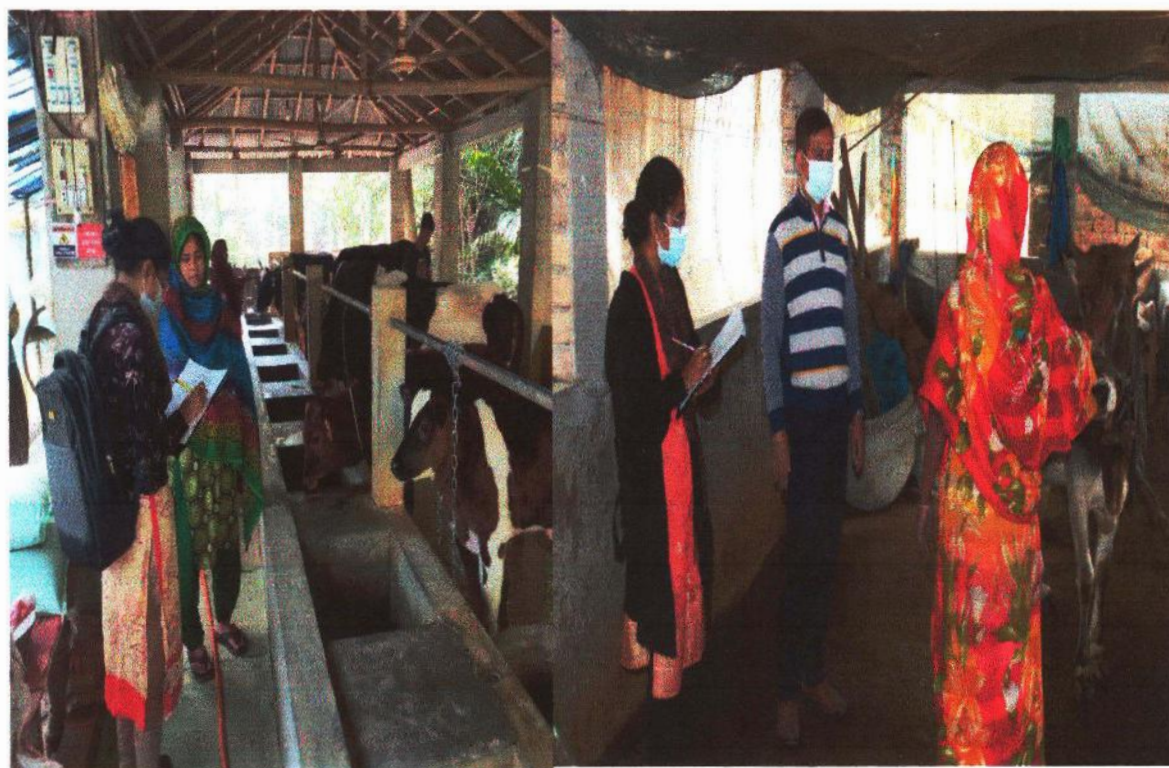
3.4 Preparation of interview schedule

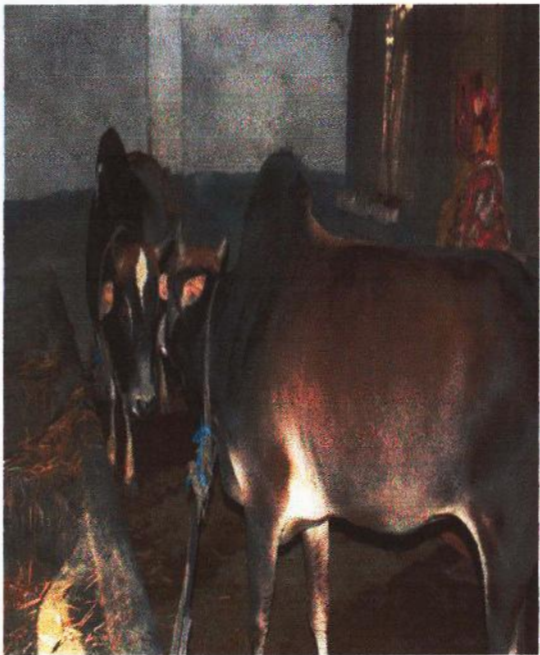
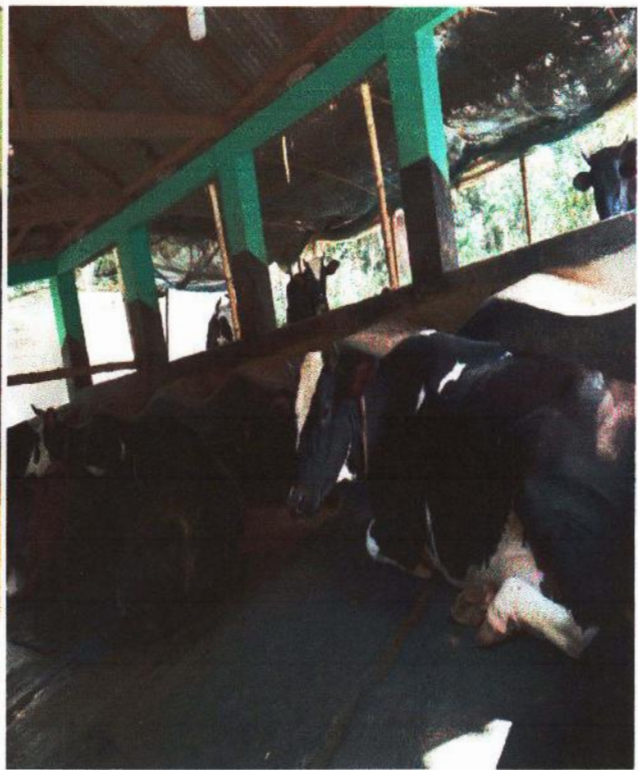
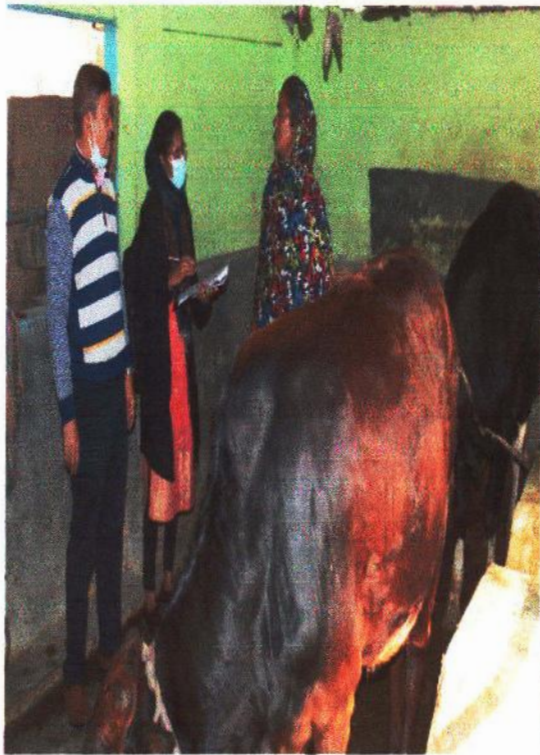
Interview schedule was prepared to collect the topic related and useful information from the respondents. The questions were easy so that the respondents could easily understand the question and could provide accurate information. After preparation of interview schedule was pretested with some beef cattle farmers. Pre-testing involves series of activities designed to evaluate a survey instruments capacity to collect the desired data the interview schedule was then multiplied in its final for collection of data. The corrected and final interview schedule was presented in the Appendix-1.

3.5 Collection of the data

The data for this study were collected by face-to-face interviewing of the respondents according to the interview schedule during January to March 2021. Before asking any question to the respondents, the purposes of the study were explained to them and requested to cooperate that they could provide the true and accurate information. The questions were explained and clarified whenever any respondents they could not understand or felt any hesitation about the question. All the information was collected without any bias. As the respondents had not any written document, they were replying from their own memory. The data sheets were checked and verified after every interview to be sure that the responses of the respondents were recorded properly. After completion of each interview, the respondent was thanked accordingly.

Photographs are given below which were taken during survey data collection.





3.6 The variables included in the study

Independent variables

A. Personal information

- Age of the respondents
- Educational qualification
- Family type and size
- Main occupation
- Experience in farming
- Experience in cattle farming

B. Economic

- Annual family income
- Income from cattle farming

C. Social information

- Organizational participation
- Training
- Media contact

D. Psychological

- Knowledge on beef cattle rearing
- Attitude towards beef cattle farming (positive and negative)

E. Beef Cattle related information

- Number of total cattle
- Number of fatten cattle
- Breeds of fatten cattle
- Purchase time
- Selling time
- Age at beginning of fattening
- Duration of fattening program
- Weight at marketing
- Area keeps for beef cattle rearing
- Housing of Beef Cattle

- Farming system
- Performances of Cattle
- Bull/Semen availability
- Vaccination
- Treatment procedure
- Feeding of Beef Cattle

Dependent variables

A. Prospect

- Relative advantages
- Poverty reduction
- Income generation

B. Problem faced

- Breed related problems
- Feed and fodder related problems
- Health related problems
- Other problems

C. Hormone related information

- Use of hormones as synthetic growth promoter
- Recommended hormones as synthetic growth promoter
- When application hormone
- Application pattern of hormones
- Adverse effect of applying hormones in beef fattening
- Negative impacts of using hormones in beef fattening

D. Antibiotics related information

- Use antibiotic as growth promoter
- Recommended antibiotic as growth promoter
- When applies antibiotics
- Application pattern of antibiotics
- Adverse effect of applying antibiotics in beef fattening
- Negative impacts of using antibiotics in beef fattening on human health

E. Urea Molasses Straw (UMS) related information

- Know about Urea Molasses Straw (UMS)
- Feed UMS to fatten cattle
- How much feed UMS to fatten cattle per day

Attitude about UMS

- Positive statement
- Negative statement

3.6.1 Measurement of variables

3.6.1.1 Age of the respondents

The age of the respondents was measured in terms of actual years from his/her birth to the time of interview on the basis of his/her statement.

Table 3.2 Categories of respondents according to their age

Age category	Score (Years)
Young age	≤ 35
Middle age	36-50
Old age	≥ 50

3.6.1.2 Level of education

The level of education was measured by the number of years of schooling. The educational status of a respondent who was illiterate was assigned a score 0. Based on level of education, the respondents were grouped into different categories as presented in Table 3.3.

Table 3.3 Categories of respondents according to their educational qualifications

Education category	Score (years of schooling)
Illiterate	0
Primary	1-5
Secondary	6-10
Higher secondary	11-12
Above	>12

3.6.1.3 Family types

The family type of the respondents was measured by total number of his/her family members including himself/herself and other dependents who were eating and staying together accordingly as nuclear, joint and extended family. Family type has been shown in the question number 3 of the interview schedule.

Table 3.4 Categories of respondents according to their family types

Family Type	Score
Nuclear	1
Joined (Horizontal)	2
Extended (Vertical)	3

3.6.1.4 Family size

The family size of a respondent was determined on the basis of numbers of members in his /her family including himself, his wife, children and those who are dependents. The total number of family members was considered as the family size score of a respondent.

Table 3.5 Categories of respondents according to their family size

Categories	Score
Small	1-4
Medium	5-6
Large	> 6

3.6.1.5 The main occupation of the respondents

A respondent might be involved more than one profession in such case the respondents indicated his primary/major profession. Based on the occupation, the respondents were grouped into different categories as presented in table 3.6.

Table 3.6 Categories of respondents according to their occupation

Main occupation	Score
Agriculture	1
Livestock	2
Fisheries	3
Mixed agriculture	4
Business	5
Service	6
Day labor	7
Agriculture + Livestock	8
Agriculture + Day laborer + Livestock	9
Agriculture + Business + Livestock	10
Business + Livestock	11
Livestock + Fisheries	12
Day laborer + Livestock	13
Livestock + Service	14
Mixed agriculture + Business	15
Mixed agriculture + Service	16
Livestock + Fisheries + Business	17

3.6.1.6 Farming Experience

The farming experience of the respondent was measured by the length covered from his/her starting years in farming to the time of interview on the basis of his/her statement. A score of one was assigned for each year of experience.

Table 3.7 Categories of the respondents according to Farming experience

Categories	Score (years)
No experience	0
Short-term experience	1-5
Medium experience	6-10
Long-term experience	>10

3.6.1.7 Experience of beef fattening

The beef fattening experience of the respondents was measured by the length covered from his starting years in beef cattle farming to the time of interview on the basis of his statement. Based on farming and beef fattening experience, the respondents were grouped into 3 categories as presented in Table 3.8.

Table 3.8 Categories of the respondents according to beef fattening experience

Categories	Score (years)
Short-term experience	1-5
Medium experience	6-10
Long-term experience	>10

3.6.1.8 Farm size

The farm size was measured in terms of decimal considering the total land area under the possession of a respondent. According to farm size the respondents divided into five groups which are as presented in Table 3.9.

Table 3.9 Categories of the respondents according to farm size

Categories	Score(decimal)
Landless farmer	<10
Marginal farmer	10-50
Small farmer	51-100
Medium farmer	101-200
Large farmer	>200

3.6.1.9 Annual income

The annual income referred to the income of a respondent on the basis of his/her total yearly earnings from different sources like- agriculture, cattle, business and others by the respondent himself/herself and other family members.

Table 3.10 Categories of the respondents according to family income (Annual)

Categories	Amount of taka
Low Income	<100,000.00
Medium Income	100,000.00-150,000.00
High Income	>150,000.00

3.6.1.10 Annual Income from Cattle

The annual income referred to the income of a respondent on the basis of his total yearly earnings from Cattle.

Table 3.11 Categories of the respondents according to the annual income from cattle rearing

Annual income from cattle	Amount of taka
Low Income	<Tk. 30,000.00
Medium income	Tk. 30,000.00 to 50,000.00
High Income	>Tk. 50,000.00
No income	0

3.6.1.11 Organization participation

The organization exposure was determined by the number of any organization involved by the respondents.

Table 3.12 Categories of the respondents according to Organization Participation

Organizational participation	Score
Participated	1
Not participated	2

3.6.1.12 Training exposure

The training exposure was determined by the number of trainings participated by the respondents.

Table 3.13 Categories of the respondents according to their training exposure

Training Experience	Score
Yes	1
No	2

3.6.1.13 Knowledge on beef fattening

Beef fattening knowledge of the respondents was measured by asking 10 selected questions and a score of 2 was assigned to each question.

Table 3.14 Categories of the respondents according to their knowledge on beef fattening

Knowledge Categories	Score
Low knowledge	1-7
Medium knowledge	8-14
High knowledge	15-20

3.6.1.14 Positive and negative attitude on cattle farming

The positive and negative attitude on cattle fattening was measured by asking questions and a score was assigned to each question.

Table 3.15 Categories of the respondents according to their Positive & Negative Attitude on cattle farming

Positive & Negative Attitude on cattle farming	Score
Low	Up to 10
Medium	(11-20)
High	(21-30)

3.6.1.15 Breed of cattle

Different cattle breeds were assigned by different scores presented in Table 3.16.

Table 3.16 Categories of the respondents according to the breed of cattle

Breed of cattle	Score
Holstein Friesian	1
Deshi/indigenous	2
Crossbred	3
Sahiwal	4
Jersey	5

3.6.1.16 Purchase time of Cattle

The respondents were purchased their cattle any time, occasionally or around the year.

Table 3.17 Categories of the respondents according to Purchase time

Purchase time	Score
Any time	1
Occasionally	2
Own	3

3.6.1.17 Selling time of cattle

Most of the respondents were sold their cattle during Eid-ul-Azha or Muslim festival time, some of the respondents sold their cattle at both times.

Table 3.18 Categories of the respondents according to selling time

Selling time	Score
Round the year	1
During Eid	2
Both time (Round the year and During Eid)	3

3.6.1.18 Age of cattle at the time of purchase

Based on purchase months the respondents were classified into different categories as shown in table 3.19

Table 3.19 Categories of the respondents according to Age at Purchase

Categories	Score (Months)
Very Recently	Upto 12 months
Recently	12-24 months
Early	25-36 months
Very Early	37 to Upto 42 months

3.6.1.19 Duration of cattle fattening

The duration of cattle rearing was scored as shown in Table 3.20.

Table 3.20 Categories of the respondents according to the duration of cattle fattening

Categories	Duration
Short duration	3-5 month
Medium duration	6-12 month
Long duration	More than 1 year

3.6.1.20 Marketing weights

Marketing weight is an important issue for fatten cattle. The marketing weight means live weight of fatten cattle. Different scores were given for different categories of age as shown in Table 3.21.

Table 3.21 Categories of the respondents according to marketing weight

Categories	weight (kg)
Low weight	150-250 kg
Medium weight	251-350 kg
Heavy weight	351-500 kg

3.6.1.21 Housing of cattle

House of cattle was categorized on the basis of its structure which is shown in Table 3.22.

Table 3.22 Categories of cattle house

Categories	Score
Permanent	4
Semi-permanent	3
All bamboo	2
Kacha	1

3.6.1.22 Availability of bull

Availability expresses in number and the respondents was classified into different categories as shown in table 3.23.

Table 3.23 Categories of the respondents according to Availability of bull

Availability of bull	Number
High	1
Moderate	2
Less available	3

3.6.1.23 Vaccination

A vaccine is a biological preparation that improves immunity to a particular disease. Different vaccines are provided to the cattle at specific age throughout their lives against various diseases. The most commonly used vaccines against Anthrax, Calf Scours, Black Quarter, Hemorrhagic Septicemia etc.

Table 3.24 Categories of the respondents according to Vaccination

Vaccination	Score
Regularly	3
Occasionally	2
Don't vaccinate	1

3.6.1.24 Type of fatten cattle

Types of cattle mean whether the farmers are fattening either indigenous or crossbred cattle (Table 3.25).

Table 3.25 Categories of the respondents according to Type of fatten cattle

Type of fatten cattle	Citation
Crossbred	2
Indigenous	1

3.6.1.25 Source of cattle

Source of cattle was meant by where the farmers got their cattle for fattening purpose. It may from either purchase or own sources (Table 3.26).

Table 3.26 Categories of the respondents according to Source of cattle

Source of cattle	Citation
Purchase	2
Own cow	1

3.6.1.26 Breeding methods

There are two types of breeding method, natural or artificial. The breeding method was scored as shown in Table 3.27.

Table 3.27 Categories of the respondents according to breeding method

Breeding method	Citation
Natural breeding	3
Artificial breeding	2
Both	1

3.6.1.2 Types of feed for fatten cattle

Feed used for raising bovine animals such as cows, bull and bullocks. In Bangladesh, feed resources for ruminants are derived two types- Roughages and concentrates.

3.6.1.27.1 Roughages

Crops residues, cereal by- products, fodder trees, hay, pasture grasses, silage, and straw fodder.

Table 3.28 Categories of the respondents according to roughage

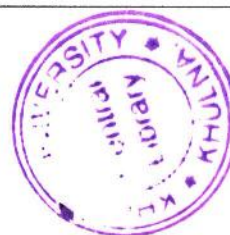
Roughage	Citation
Roadside grass	2
Cultivated fodder	1

3.6.1.27.2 Concentrate

Concentrates are low-fiber, high energy feeds when compared to forages and they can vary considerably in their protein contents. There are two types of feed- compound feed and mixed feed.

Table 3.29 Categories of the respondents according to Concentrate

Concentrate	Citation
Compound feed	2
Mixed feed	1



3.6.1.28 Source of feed

The respondent was purchased their cattle feed, readymade, homemade or both.

Table 3.30 Categories of the respondents according to Source of feed

Source of feed	Citation
Purchase/Readymade	3
Homemade	2
Both	1

3.6.1.29 Treatment procedures

Treatments are applied when cattle are affected by different diseases. Farmers treated their cattle by local doctor, veterinarian and own.

Table 3.31 Categories of the respondents according to Treatment procedure

Treatment procedure	Citation
Local doctor	3
Veterinarian	2
No treatment	1

3.6.1.30 Record keeping status

The responded was keeping record on cattle measuring Height, weight, number of cattle and death of cattle etc.

Table 3.32 Categories of the respondents according to keeping records

Keeping records	Citation
Yes	2
No	1

3.6.1.31 Caretaker of Cattle farm

The respondent of cattle farmer, the caretaker of cattle farmer was male and female.

3.6.1.34 Prospect of beef cattle fattening

The respondents were asked some questions which were incorporated in the questionnaire and related to relative advantages, poverty reduction, employment and income generation. Based on prospect scores the respondents were classified into the following categories as shown in table 3.36.

Table 3.36 Categories of the respondents on the basis of their statement regarding the prospects (relative advantages) of beef fattening

Prospect (relative advantages)	Score
Low	1-13
Medium	14-26
High	27-39

Table 3.37 Categories of the respondents on the basis of their statement regarding the prospects (poverty reduction) of beef fattening

Prospect (poverty reduction)	Score
Low	1-6
Medium	7-12
High	13-18

3.6.1.35 Appoint of labor for fattening

The respondent was sometimes appointed labors for their cattle farms. Scores are shown in Table 3.38.

Table 3.38 Categories of the respondents according to appoint of labor for fattening

Appoint labor	Score
Yes	1
No	2

3.6.1.36 Problems faced during beef cattle fattening

The respondents were asked about the problems faced in beef fattening. A number of 19 problems were incorporated in the interview schedule. The problems were categorized into high moderate and less, not at all a problem. A score of 3, 2, 1 and 0 was assigned to the scale respectively. Based on problem scores the respondents were classified into the following categories as shown in Table 3.39.

Table 3.39 Categories of the respondents on the basis of problem severity faced during beef cattle fattening

Problem's Categories	Score
Less	<20
Moderate	20-39
High	≥40

3.7 Processing of the primary data

After completing collection, all the data were compiled, coded and then tabulated for the processing. Local units were converted into standard units. For analyzing the data was transferred into a master sheet and finally they were analyzed.

3.8 Data tabulation and analysis

Simple statistical method was used for analyzing the data so that the objectives can be fulfilled easily and accurately. Different statistical methods were used like number, mean, SD, minimum, maximum and percentage to explain the variables. To analyze the data, the IBM SPSS statistics was used. Collected data was analyzed to interpret the results using Statistical Package for Social Science (SPSS, 1999) and Microsoft Excel.

CHAPTER IV

RESULTS AND DISCUSSION

The study was conducted at Dumuria upazila under Khulna district, Fokirhat under Bagerhat District and Tala under Satkhira District. In this chapter the findings of the research are presented and are discussed.

Socio-economic status of the beef cattle farmers

Table 4.1 Socioeconomic condition of beef farmers of selected areas

Socioeconomic factors of the Cattle farmers						
Characters	Categories	Frequency	Percent	Valid Percent	Cumulative Percent	Mean $\pm$ SD
Age	Long age <30years	16	17.8	17.8	17.8	41.46 $\pm$ 12.734
	Medium age 30-50years	55	61.1	61.1	78.9	
	Old age 51-80years	19	21.1	21.1	100.0	
	Total	90	100.0	100.0		
Education	Illiterate	11	12.2	12.2	12.2	8.81 $\pm$ 5.088
	Primary (1-5)	11	12.2	12.2	24.4	
	Secondary (6-10)	42	46.7	46.7	71.1	
	Higher secondary (11-12)	10	11.1	11.1	82.2	
	Graduate and above	14	15.6	15.6	97.8	
	Sign up only	2	2.2	2.2	100.0	
	Total	90	100.0	100.0		
Family size	Small (1-4)	39	43.3	43.3	43.3	5.16 $\pm$ 2.044
	Medium (5-7)	39	43.3	43.3	86.7	
	Large (>7)	12	13.3	13.3	100.0	
	Total	90	100.0	100.0		
Farm size	Landless (<10 decimal)	8	8.9	8.9	8.9	113.11 $\pm$ 92.180
	Marginal (10 to 50 decimal)	17	18.9	18.9	27.8	
	Small (51 to 100 decimal)	22	24.4	24.4	52.2	
	Medium (101 to 200 decimal)	25	27.8	27.8	80.0	
	Large (>200 decimal)	18	20.0	20.0	100.0	
	Total	90	100.0	100.0		

Annual Income	Low Income (<Tk. 100,000.00)	14	15.6	15.6	15.6	232333.33±184385.1 00
	Medium income (Tk. 100,000.00 to 150,000.00)	24	26.7	26.7	42.2	
	High Income (>Tk. 150,000.00)	52	57.8	57.8	100.0	
	Total	90	100.0	100.0		

Data of the Table 4.1 show that the majority (61.1%) of the respondents were middle aged followed by old aged (21.1%) and young aged (17.8%). The average age of the respondents in the studied area was 41.46 years with standard deviation of 12.734. The result of this study was inconsistent with that of Ahmed *et al.* (2010) where they reported that 50.2 % respondents were in the middle-aged category, 22.3 % and 24.4 % of the respondents were in the young and old aged category, respectively. Similarly, Rashid *et al.* (2016) reported that, age does not have any role in keeping livestock in the studied areas.

Data of the Table 4.1 indicate that majority (46.7%) of the respondents had Secondary level of education followed by graduate or above (15.6%), illiterate (12.2%), Primary (12.2%), Higher Secondary (11.1%), and sin up only (2.2%) level of education. The average schooling year was 8.81 with standard deviation 5.09. Rashid *et al.* (2016) stated that 52 % of the respondents had Primary education, (27%) had Secondary, (14%) Higher Secondary and the rest were Graduates and Post-graduates (7%), respectively.

Data of the Table 4.1 also indicate that majority (57.8%) of the respondents belonged to high annual income group, 15.6% belonged to low annual income group and 26.7% belonged to medium annual income group. The average income of the respondents was 2,32,333.33tk/year with standard deviation 1,84,385.10. The findings of the study were almost similar with Islam *et al.* (2012), where they observed that majority (47%) of the respondent belonged to low annual income group followed by 26% medium and 20% high income group.

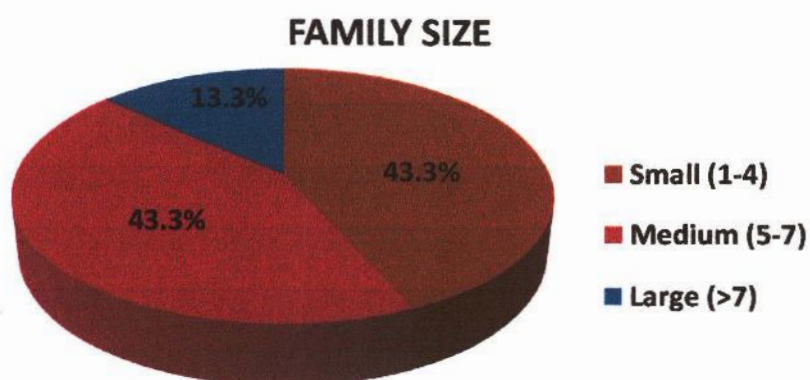


Fig.4.1 Farmers' category according to the family size

Data of the table 4.1 also indicated that both small and medium family size were 43.3% while large family was 13.3%. The average number of family member was 5.16 with standard deviation 2.04. Whereas, Ahmed *et al.* (2010) found that 60.2% of the respondents belong to large sized family, 39.5% medium and rest of them had small sized family.

Table 4.2 Main occupations of the respondents

Occupations	Frequency	Percent	Valid Percent	Cumulative Percent
Livestock rearing	8	8.9	8.9	8.9
Mixed agriculture	27	30.0	30.0	38.9
Agriculture + livestock	30	33.3	33.3	72.2
Agriculture +Day laborer +livestock	1	1.1	1.1	73.3
Agriculture + Business + livestock	6	6.7	6.7	80.0
Business + livestock	9	10.0	10.0	90.0
Day laborer +Livestock	3	3.3	3.3	93.3
Livestock +Service	2	2.2	2.2	95.6
Mixed agriculture +Business	1	1.1	1.1	96.7
Mixed agriculture +Service	1	1.1	1.1	97.8
Livestock +Fisheries +Business	2	2.2	2.2	100.0
Total	90	100.0	100.0	

It was found that the occupation of 33.3% respondents was agriculture + livestock followed by mixed agriculture (30.0%), business+ livestock (10.0%), livestock rearing (8.9%), agriculture+ business+ livestock (6.7%), day laborer + livestock (3.3%), livestock+ service (2.2%), livestock + fisheries + business (2.2%) and others occupation (1.11%). Kamal *et al.*, (2019) reported that, 63.8% of the respondents had main occupation as agriculture, 27.5% were related in the livestock business. Similarly, Ahmed *et al.* (2010) reported that 70.2% of respondents involved in agriculture, 11.2% in business, 8.4 % in teaching, 6.5 % in service and 3.3% doctor.

Table 4.3 Family types of the respondents

Family Types	Frequency	Percent	Valid Percent
Nuclear	30	33.3	33.3
Joined	60	66.7	66.7
Total	90	100.0	100.0

Data of the Table 4.3 indicate that majority (66.7%) of the respondents belonged to joined family and 33.3% of the respondents had nuclear family.

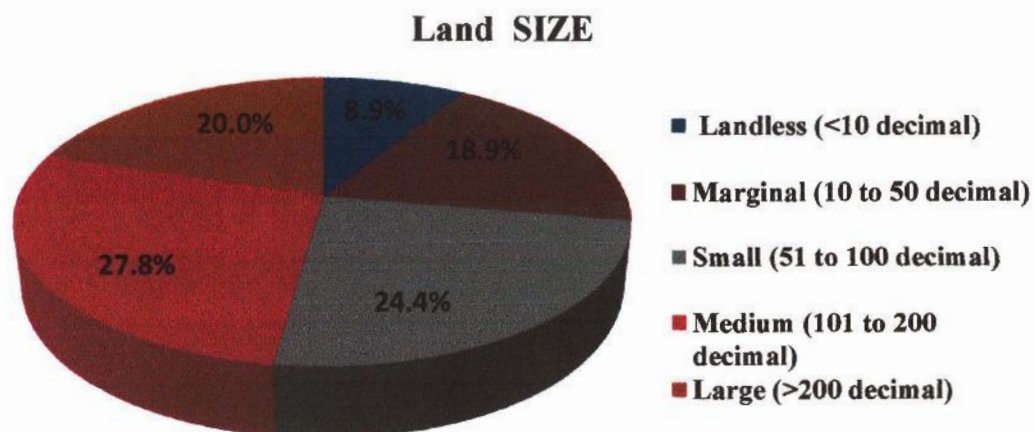


Fig 4.2 Farmers' category according to the land size

The results of the study also indicate that majority of the respondents (27.8%) had medium sized farms followed by small (24.4%), large (20.0%), marginal (18.9%) and landless (8.9%). The

respondents had average 113.11ha of land with standard deviation 92.18. The results of this study were not consistent with Mamun *et al.* (2018), who reported that, 34.3% respondents belonged to landless, while 30% small sized land, 28.3% marginal and only 3.3% belonged to medium sized farm.

Table 4.4 Agricultural and cattle farming experiences of the respondents according to the location of the study

Location of the study		Experience of agriculture farming (years)	Experience of cattle farming (years)
Dumuria	N	30	30
	Mean	19.57	11
	Std. Deviation	9.20	6.13
Tala	N	30	30
	Mean	13.57	18.1
	Std. Deviation	16.92	11.35
Fakirhat	N	30	30
	Mean	13.5	14.7
	Std. Deviation	11.94	10.74
Total	N	90	90
	Mean	15.54	14.6
	Std. Deviation	13.25	10.01
	F-value	2.128	4.03
	Level of Significance	0.125	0.021*

Data presented in Table 4.4 reveal that the average agricultural farming experiences of the cattle farmers of Dumuria upazila was about 19.5 years, cattle farmers of Tala upazila was 13.5 years and the cattle farmers of Fakirhat upazila was 13.5 years. The average agricultural farming experience of the studied area was about 15.5 years. The findings also show that the average highest cattle farming experience of the respondents of Tala upazila was about 18 years followed by Fakirhat upazila (14.5 years) and Dumuria upazila (about 11 years). The average cattle farming experience of the studied area was about 14.5 years. The F value of agriculture farming experience was 2.13 and average cattle farming experience 4.03.

Table 4.5 Categories of farming experience of the respondents

Categories of farming experience	Frequency	Percent	Valid Percent	Cumulative Percent	Mean $\pm$ SD
No experience	19	21.1	21.1	21.1	15.54 $\pm$ 13.25
Short term (1-5yrs)	10	11.1	11.1	32.2	
Medium(6-10 yrs)	13	14.4	14.4	46.7	
Long term (>10 yrs)	48	53.3	53.3	100.0	
Total	90	100.0	100.0		

Data of the Table 4.6 show that 53.3% of the respondents had long term experience in farming followed by of the respondents had no experience (21.1%), medium experience (14.4%) and short-term experience (11.1%). The respondents had average 15.54 years of farming experience with standard deviation 13.45. The result of the study was inconsistent with that of Mamun *et al.* (2018), who reported that 41.7% of the farmers had 5-10 years of experience, 35% had 1-5 years of experience, 15% had 16-20 years, 3.3% had 21-25years, 3.3% had 26-30 years and only 1.7% farmers had 11-15 years of experience.

Table 4.6 Experience of cattle farming of the respondents

Categories	Frequency	Percent	Valid Percent	Mean $\pm$ SD
Short-term (1-5 yrs)	17	18.9	18.9	14.60 $\pm$ 10.01
Medium (6-10 yrs)	29	32.2	32.2	
Long-term (>10 yrs)	44	48.9	48.9	
Total	90	100.0	100.0	

Data of the Table 4.7 show that about 18.9% of the respondents had short term experience in cattle farming, 32.2% had medium experience and 48.9% had long term experience in cattle farming. The respondents had average 14.60 years of cattle farming experience with standard deviation 10.01. Similarly, Sarma *et al.* (2014) found that that 14% of the respondents had below 5 years of experience; the highest percentage of farmers (47%) had experiences of 5-10 years in farming.

Number of cattle per household

Table 4.7 Total number of cattle per household according to three locations of the study

Location of the study		Number of cattle	Number of fatten cattle
Dumuria	N	30	30
	Mean	2.8	1.73
	Std. Deviation	2.83	0.78
Tala	N	30	30
	Mean	3.57	2.37
	Std. Deviation	3.87	2.09
Fakirhat	N	30	30
	Mean	5.1	2.17
	Std. Deviation	3.71	2.60
Total	N	90	90
	Mean	3.82	2.09
	Std. Deviation	3.59	1.98
	F-value	3.36	0.80
	Level of Significance	0.039*	0.45

Data contained in the Table 4.5 indicate that the average of total number of cattle per household in Dumuria upazila was 2.8 where average number of fatten cattle was 1.73. In case of Tala upazila the average total number of cattle was 3.57 where average number of fatten cattle was 2.37 per household. In case of Fakirhat upazila the average of total number of cattle was about 5 where number of average fatten cattle was 2.2 per households. It was clear from the study that the highest total number of cattle was found in Fakirhat upazila and the highest average number of fatten cattle were found in Tala upazila. The mean difference between the average total numbers of cattle in three upazila was found significant. The F-value for total number of cattle was 3.36 and for number of fatten cattle was 0.80.

Table 4.8 Annual incomes from cattle rearing

Categories of annual income group	Frequency	Percent	Mean $\pm$ SD
Low Income (<Tk. 30,000)	9	10.0	99,722.22 $\pm$ 86216.87
Medium income (Tk. 30,000 to 50,000)	21	23.3	
High Income (>Tk. 50,000)	58	64.4	
No income	2	2.2	
Total	90	100.0	

Data of the Table 4.8 also indicate that majority of the respondents (64.4%) belonged to high income, followed by medium annual income (23.3%) and low (10.0%) income from cattle group. The average income from cattle rearing of the respondents was 99,722.22 tk/year with standard deviation 86216.87. Similarly, Islam *et al.* (2012) stated that, 26% of the respondents belong to medium income, 47% low income and 26% of the respondents belonged to high income from cattle.

Table 4.9 Organizational participation of beef cattle farmers

Respondents Participation	Frequency	Percent
Participated	12	13.3
Not participated	78	86.7
Total	90	100.0

The study shows that about 86.7% of the respondents had not participate any organization on beef fattening. However, 13.3% of the respondents were participated organizations on beef fattening.

Table 4.10 Training experience of beef cattle farmers

Training experience	Frequency	Percent
Yes	37	41.1
No	53	58.9
Total	90	100.0

The study shows that about 58.9% of the respondents had no training on beef fattening. However, 41.1% of the respondents had short training on beef fattening. Mamun *et al.* (2018) observed that, 93.3% of the respondents didn't get any training whereas various levels of experiences were observed among the respondents. Ahmed *et al.* (2010) observed that majority (79.3%) of the respondents had no training on cattle farming followed by 16.7% low training, 3.3% medium training and 0.7% of the respondents received high level of training. Kamal *et al.* (2019) found that, 76.3% of the respondents did not have any training on cattle fattening whereas about 23.8% respondents got short training on cattle fattening.

Table 4.11 Knowledge categories of the respondents on cattle rearing

Knowledge categories	Frequency	Percent
Low knowledge (1-7)	3	3.3
Medium knowledge (8-14)	79	87.8
High knowledge (15-20)	8	8.9
Total	90	100.0

The findings revealed that 87.8% of the respondents had medium knowledge about cattle rearing followed by high knowledge (8.9%) and low knowledge (3.3%). Islam *et al.* (2012) found that, only 30% of the respondents had knowledge about cattle rearing and health hazard effect of steroid.

Table 4.12 Positive attitude of the respondents on cattle farming

Positive attitude	Frequency	Percent
Medium (10-20)	60	66.7
High (21-30)	30	33.3
Total	90	100.0

The results of the study show that two-third (66.7%) of the respondents described medium positive attitude on cattle farming and 33.3% cases it was described as high positive attitude. Nobody stated cattle farming as low or no attitude in south western coastal region of Bangladesh.

Positive attitudes of the respondents on cattle rearing

SI. No.	Statement	Score	Percentage (%)	Ranking
1	Beef cattle farming is easier	330	73.33	4 th
2	Diseases are lesser than other animals	369	82.00	3 rd
3	Beef cattle farming is profitable than other farming	396	88.00	1 st
4	Demand for beef in the market is high	396	88.00	1 st
5	Required minimum feed	245	54.44	5 th

Among different statements, “Beef cattle farming is profitable than other farming” and “Demand for beef in the market is high” were ranked 1st.

Table 4.13 Negative attitude of the respondents on cattle farming

Negative Attitude	Frequency	Percent
Low (>10)	1	1.1
Medium (10-20)	81	90.0
High (21-30)	8	8.9
Total	90	100.0

The study revealed that highest 90.0% of the respondents had medium negative attitude about cattle rearing followed by high (8.9%) and low (1.1%) negative attitude.

Attitude (negative) of the respondents on cattle rearing

SI. No.	Statement	Score	Percentage (%)	Ranking
1	Beef cattle maintenance is very hard	275	61.11	3 rd
2	Mortality rate of beef cattle is very high	368	81.78	2 nd
3	Demand of beef (meat) is low	393	87.33	1 st
4	Beef cattle are dirty	261	58.00	4 th
5	Quality of local beef cattle is poor	241	53.56	5 th

From the study it was found that the statements about the negative attitudes on cattle farming by the respondents of “demand of beef meat is low”, “the mortality rate of cattle is high” and “cattle maintenance is very hard” ranked 1st, 2nd and 3rd position, respectively.

Table 4.14 Breeds of cattle reared by the respondents

Breed of cattle	Frequency	Percent
Holstein Friesian	33	36.7
Deshi/Indigenous	34	37.8
Crossbred	14	15.6
Shahiwal	8	8.9
Jersey	1	1.1
Total	90	100.0

Data of the Table 4.14 indicate that the majority (37.8%) of the respondents reared indigenous (deshi) breed of cattle followed by Holstein Friesian (36.7%), crossbred (15.6%), shahiwal (8.9%) and jersey (1.1%) breed of cattle. Similarly, Rahman *et al.* (2012) reported that about 60% of the respondents used deshi and crossbred cattle for fattening, 28% deshi and 12% crossbred.

Table 4.15 Types of cattle housing

Types of cattle housing	Frequency	Percent
Permanent structure	16	17.8
Semi-permanent	68	75.6
Bamboo structure	3	3.3
Kacha	3	3.3
Total	90	100.0

Data of the Table 4.15 also indicate that the majority (75.6%) of the respondents provided semi-permanent housing, 17.8% respondents provided permanent, 3.3% provided bamboo structure and 3.3% provided kacha houses for their cattle. Mamun *et al.* (2018) found that, about 36.7% farmers provided permanent housing, 36.7% farmer's semi-permanent, 23.3% farmers tin shade and bamboo structure and 3.3% farmers provided earthen wall houses for their beef cattle.

Table 4.16 Purchase time of cattle for fattening

Purchase time	Frequency	Percent
Any time in the year	64	71.1
Occasionally	18	20.0
Own	8	8.9
Total	90	100.0

Data of the Table 4.16 indicate that the majority (71.1%) of the respondents purchased their cattle at any time in the year, 20.0% occasionally and 8.9% of the respondent reared their own cattle. Mamun *et al.* (2018) stated that, 63.3% of the respondents purchased cattle at any time of the year and 36.7% respondents purchased cattle occasionally.

Table 4.17 Selling time of fatten cattle

Selling time	Frequency	Percent
Round the year	30	33.3
During Eid	36	40.0
Both time (Round the year and During Eid)	24	26.7
Total	90	100.0

Data of the Table 4.17 indicate that the majority (40.0%) of the respondents sold their cattle during Eid ul-Azha (muslim festival), 33.3% round the year and (26.7%) of the respondent sold their cattle both time (Round the year and During Eid). Mamun *et al.* (2018) stated that, 90% of the respondents sold their cattle occasionally and rest 10% sold during Eid or any time in the year.

Table 4.18 Age of cattle at purchase time

Age at purchase	Frequency	Percent
Upto 12 months	47	52.2
12-24 months	39	43.3
25-36 months	3	3.3
37 to Upto 42 months	1	1.1
Total	90	100.0

Data of the Table 4.18 show that about 52.2% of the respondents purchased their cattle at the age of Upto 12 months, 43.3% farmers purchased cattle at the age from 12-24 months, 3.3% between 25-36 months and only 1.1% 37 to Upto 42 months during purchase for fattening.

Table 4.19 Duration of cattle fattening

Duration of cattle fattening	Frequency	Percent
3-5 month	5	5.6
6-8 month	2	2.2
9-12 months	35	38.9
More than 1 year	48	53.3
Total	90	100.0

Fattening period was the most important factor because it measured profit percentage of the respondents. Data of the table 4.19 indicate that the majority (53.3%) of the respondents reared for fattening more than 1 year followed by 38.9% fattened 9-12 months, 5.6% practiced 3-5 months and rest 2.2 % fatten their cattle for 6-8 months.

Similarly, Kamal *et al.* (2019) found that 16.3% of the respondents practiced fattening for 3 months or less and maximum numbers of respondents (35%) fatten for 3-6 months and 31.3% respondents fattened their cattle for 6 months to 1 years and the rest above 1 year. Ahmed *et al.* (2010) observed that, 79.1% of the respondents found that the suitable fattening period of cattle was 3-6 months before Eid-ul-Azha, 4.7% reared for 6-12 months and 16.3% respondents fattening their cattle for above 1 year.

Table 4.20 Marketing weights of fatten cattle

Marketing weight (kg)	Frequency	Percent
150-200 kg	13	14.4
201-250 kg	42	46.7
251-300 kg	15	16.7
301-350 kg	5	5.6
351-400 kg	9	10.0
401-500 kg	6	6.7
Total	90	100.0

Data of the Table 4.20 show that in 46.7% cases, marketing weight/live weight of cattle ranged from 201-250 kg (low weight), 16.7% cases it was between 251-300 kg (medium weight), 14.4% were between 150-200 kg (low weight), 10.0% were between 351-400 kg (heavy weight), 6.7% were between 401-500 kg (heavy weight) and 5.6% were between 301-400 kg of marketing weight.

Table 4.21 Availability of bulls for breeding purpose

Availability of bull	Frequency	Percent
Highly available	42	46.7
Moderately available	48	53.3
Total	90	100.0

Data of the Table 4.21 show that about 53.3% respondents stated moderately availability of breeding bulls and 46.7% respondents stated that the breeding bull were highly available.

Table 4.22 Vaccination pattern of fatten cattle

Vaccination	Frequency	Percent
Regularly	81	90.0
Occasionally	5	5.6
No vaccination	4	4.4
Total	90	100.0

The results of the study show that 90% of the respondents gave vaccines regularly to their cattle to protect from the diseases, 5.6% of the respondents gave vaccine occasionally and 4.4% said that they did not give any vaccination to their cattle (Table 4.22). Ahmed *et al.* (2010) reported that, 72.6% respondents vaccinated cattle against infectious disease regularly and 27.4% provided vaccines irregularly. Mamun *et al.* (2018) also reported that 26.7% of the respondents practiced vaccination and 73.3% respondents didn't practice vaccination.

Table 4.23 Types of feed for fatten cattle

Types of feed	Frequency	Percent	Valid Percent
Rice straw +green grass +concentrates	90	100.0	100.0

The results of the study showed that all (100%) of the respondents fed rice straw, green grass and concentrated feed to their cattle (Table 4.23). Mamun *et al.* (2018) reported that majority (58.3%) of the respondents provided cultivated fodder and compound feed, while 5% fed roadside grass and cultivated fodder, 10% cultivated fodder and mixed feed, 23.3% fed roadside grass, cultivated fodder and compound feed and rest 1.7% of the respondents fed roadside grass to the beef cattle.

Table 4.24 Types of fatten cattle

Types of fatten cattle	Frequency	Percent
Crossbred	57	63.3
Indigenous	33	36.7
Total	90	100.0

Data of the Table 4.24 indicate that majority (63.3%) of the respondents reared crossbred cattle for fattening purpose and 36.7% reared indigenous or deshi cattle. Islam *et al.* (2012) reported that, 42.7% of the respondents selected indigenous while 57.3% selected crossbreed for fattening purpose. Similarly, Kamal *et al.* (2019) also reported that 26.3% of the respondents selected indigenous and 32.5% selected crossbreed and 41.3% select both crossbreed and local for fattening purposes.

Table 4.25 Source of cattle for fattening purpose

Source of cattle	Frequency	Percent
Purchase	53	58.9
Own cow	37	41.1
Total	90	100.0

The results of the study showed that 58.9% of the respondents purchased their fatten cattle from local market and 41.1% of the respondents fattening their own cattle. Mamun *et al.* (2018) reported that 53.3% of the respondents fatten cattle from their own source, 40% respondents purchased their fatten cattle and 6.7% of the respondents fatten cattle from both sources.

Table 4.26 Breeding methods for beef cattle

Breeding methods	Frequency	Percent
Natural breeding	4	4.4
Artificial breeding	74	82.2
Both (Natural and Artificial)	12	13.3
Total	90	100.0

The results of the study stated that 82.2% of the respondents practiced artificial breeding method followed by 13.3% of the respondents practiced both natural and artificial methods and only 4.4% followed natural breeding method in for fatten cattle. Mamun *et al.* (2018) reported that 46.7% of the respondents practiced artificial insemination, 40% practiced natural method and rest 13.3% of the respondents practiced both methods.

Table 4.27 Types of green roughages

Green roughages	Frequency	Percent
Roadside grass	67	74.4
Cultivated fodder	23	25.6
Total	90	100.0

The results of the study showed that 74.4% of the respondents fed roadside grass and rest 25.6% fed cultivated fodders to their fatten cattle.

Table 4.28 Types of concentrate feed

Types of concentrate feed	Frequency	Percent
Compound feed	36	40.0
Mixed feed	54	60.0
Total	90	100.0

The results of the study show that majority (60.0%) of the respondents fed mixed feed and 40.0% fed compound feed to their fatten cattle.

Table 4.29 Sources of concentrate feeds

Sources of concentrate feeds	Frequency	Percent
Purchase/Readymade	76	84.4
Homemade	9	10.0
Both	5	5.6
Total	90	100.0

Data of the Table 4.29 indicate that majority (84.4%) of the respondents used Purchase/Readymade feed, 10.0% fed homemade feed and 5.6% feed both types of concentrate feed.

Table 4.30 Treatment procedures of sick animals

Treatment procedures	Frequency	Percent
Local doctors	79	87.8
Veterinarian	11	12.2
Total	90	100.0

Data of the Table 4.30 stated that 87.8% of the respondents called local doctors for treatments of sick animals and 12.2% called veterinarian. Ahmed *et al.* (2010) reported that 76.3% of the respondents took help from veterinary surgeon for treatment of their sick cattle and 23.7% took help from local doctor/ village doctor. Mamun *et al.* (2018) reported that 90% called local doctors for treatment and 10% of the respondents took help from veterinarian for treatment of their cattle.

Table 4.31 Status of keeping farm records

Status of record keeping	Frequency	Percent
Yes	3	3.3
No	87	96.7
Total	90	100.0

The results of the study show that 96.7% of the respondents did not keep any farm records and 3.3% of the respondents kept records of their farms. Similarly, Mamun *et al.* (2018) reported that 96.7% of the respondents did not keep any records of their cattle and only 3.3% of the respondents used to keep records regularly

Table 4.32 Caretaker of cattle farms

Caretaker	Frequency	Percent
Male	76	84.4
Female	14	15.6
Total	90	100.0

The results of the study revealed that 84.4% of the cases males were the caretaker of cattle farms and 15.6% of the cases females were the caretaker. Rashid *et al.* (2016) reported that 90% of the respondents were male cattle farmers and rest 10% of the respondents was female cattle farmers.

Table 4.33 Sources of capital

Source of capital	Frequency	Percent
Bank loan	15	16.7
NGO loan	5	5.6
Others	1	1.1
Own	69	76.7
Total	90	100.0

Data of the Table 4.33 indicate that majority (76.7%) of the respondents start their cattle fattening using own money, 16.7% got a bank loan 5.6% of the respondent goat loan from NGOs and 1.1% from other sources. Kamal *et al.* (2019) reported that 51.3% of the respondents run their cattle fattening business by own money, 20% from NGO loan, 23.8% bank loan and 5% took loan from mohajon. Ahmed *et al.* (2010) reported that 90.2% of the respondents used own capital for cattle fattening, 2.3% bank loan, 4.2% NGO loan and 3.3% respondents took lending for cattle fattening.

Table 4.34 Frequency of visiting of upazila Livestock offices

Frequency	Frequency	Percent
Frequently	2	2.2
Occasionally	21	23.3
Very rare	37	41.1
Never	30	33.3
Total	90	100.0

The results of the study showed that 41.1% of the respondents visited upazila livestock office very rare, 23.3% of the respondents occasionally and 33.3% said that they did not visit livestock offices and 2.2% of the respondent frequently visited upazila livestock offices (Table 4.34). Mamun *et al.* (2018) reported that majority 63.3% of the respondents never went to upazila livestock offices for getting information about beef cattle production and rest 36.7% visited upazila livestock offices frequently.

Rank order of prospect of beef fattening

Table 4.35 Rank order of different statements of relative advantages

SI. No.	Statement	Score	Percentage (%)	Ranking
1	Short period of rearing	160	59.26	6 th
2	Demand of beef than other meats	249	92.22	2 nd
3	Special market during Eid-ulAzha	254	94.07	1 st
4	Medicine requirement	171	63.33	5 th
5	Mortality of beef cattle than other animals	108	40.00	11 th
6	Investment in beef cattle farming than other farming	234	86.67	3 rd
7	Feed requirement than other farming	211	78.15	4 th
8	Cost of housing for beef cattle	122	45.19	9 th
9	Labour requirement	106	39.26	12 th
10	Sensitivity to the diseases	135	50.00	7 th
11	Need of skilled person	118	43.70	10 th
12	Need of especial training	132	48.89	8 th

From the results it found that the statements of “Special market during Eid-ulAzha”, “Demand of beef meat”, and “Investment in beef cattle farming than other farming” were ranked 1st, 2nd and 3rd, respectively. Other advantages of beef fattening described by the farmers are ranked according to their merits (Table 4.35). Similarly, Hashem *et al.* (1999) reported that lack of training, lack of credit facilitated, price variation in different markets, disorganized marketing system were the problem for cattle fattening of Bangladesh.

Table 4.36 Poverty reduction

SI. No.	Statements	Score	Percentage (%)	Ranking
1	How was your economic condition before beef cattle farming?	86	31.85	6 th
2	How is your economic condition after beef cattle farming?	223	82.59	1 st
3	How does beef cattle farming help to change the infrastructure of your house?	177	65.55	2 nd
4	How does beef cattle's farming contribute to the education of your children?	120	44.44	3 rd
5	How does beef cattle's farming contribute to your clothing?	95	35.18	4 th
6	How does beef cattle farming help to get proper medical treatment of your family members?	86	31.85	5 th

Different aspects of poverty reduction by beef cattle fattening are ranked in Table 4.36. Most of the respondents' economic condition was developed after starting beef cattle farming business. Due to the improvement of the economic conditions of the respondents, condition of their own houses, their clothing, education, treatment facilities, etc were also improved. Karim *et al.* (2020) stated that cattle fattening could be the most suitable way to increase the socio-economic status of the poor farmers.

Table 4.37 Appointing of labors for beef cattle fattening

Appointing labors	Frequency	Percent
Yes	5	5.6
No	85	94.4
Total	90	100.0

The results of the study showed that 94.4% of the respondents didn't get appoint any labor for their cattle farming and only 5.6% of the respondents appointed labor hiring on day basis or permanently for their cattle farming. Kamal *et al.* (2012) reported that 89.3% of the respondents used their own labors, 7.3% dependents on hired labor and rest 3.3% get labor from both sources.



Ahmed *et al.* (2010) reported that almost all the respondents reported that one or more of their family members were involved in beef cattle rearing program. Not a single respondent is reported to hired labor for this purpose.

Table 4.38 Income increase

Income increase	Frequency	Percent	Valid Percent
Yes	90	100.0	100.0

All (100%) of the respondents were reported to increased their income by beef cattle fattening. Similarly, Karim *et al.* (2020) stated that 31.39% of the respondents increased their family income by beef cattle fattening.

Table 4.39 Categories of problems for cattle farming

Problem's categories	Frequency	Percent
Less (≤ 20)	1	1.1
Moderate (21-40)	75	83.3
High (> 40)	14	15.6
Total	90	100.0

The findings showed that 83.3% of the respondents faced moderate problems followed by 15.5% high problem and 1.1% fewer problems faced during cattle farming (Table 4.39). Mamun *et al.* (2018) reported that majority 73.3% of the respondents had less problem confrontation while 26.6% of the respondents had medium problem confrontation and none of them had high problem confrontation.

Table 4.40 Rank orders of the problems faced by the respondents during beef cattle fattening

SI. No.	Statement	Score	Percentage (%)	Ranking
A.	Breed related problems			
1	High price of good breed	247	91.48	3 rd
2	Lack of quality breed in time	201	74.44	7 th
3	Lack of breeding bulls/semen	181	67.04	11 th
B.	Feeds & fodder related problems			
4	High price of feeds and fodder	248	91.85	2 nd
5	Unavailability of quality feeds and fodder	186	68.89	10 th
6	Lack of knowledge of feed production	214	79.26	5 th
7	Lack of grazing land	266	98.52	1 st
C.	Health related problems			
8	High mortality rate	85	31.48	17 th
9	Unavailability of Vaccine and medicines	127	47.04	15 th
10	High prices of vaccine and medicines	240	88.89	4 th
11	Lack of veterinary surgeons	135	50.00	14 th
12	Disease susceptibility	112	41.48	16 th
D.	Other problems			
13	Lack of artificial insemination facilities	150	55.56	13 th
14	Lack of capital and loan facilities	208	77.04	6 th
15	Lack of marketing facilities	180	66.67	12 th
16	Lack of Govt. support	190	70.37	9 th
17	Lack of training facilities	191	70.74	8 th

Research findings stated that the most severe problem faced by the respondents (98.52%) was lack of grazing land. After that some other problems were found of which 91.85% was high price of feeds and fodder, 91.48% high price of good breed, 88.89% was high price of vaccines and medicines, 79.26% lack of knowledge of feed production, 77.04% lack of capital and loan

facilities, 74.44% lack of quality breed in time, 70.74% lack of training facilities, 70.37% lack of Govt. support and rest of them was show different percentage and ranking of problems.

This result was also in agreement with the findings of Islam *et al.* (2012), who ranked the problems statements and described that 34% was the high price of concentrate feed, 27.33% was lack of knowledge, and 20% was appropriate breed and capital problem, 8.7% lack of knowledge about feed additives and anabolic steroids, 36% of the respondents suggested that selection of breed, 25.3% good feeding and management 18.7% was deworming, 13.3% reduction of concentrate feed cost and 6.7% availability of training facilities for cattle fattening.

Table 4.41 Use of hormone

Use of hormone	Frequency	Percent
Yes	33	36.7
No	57	63.3
Total	90	100.0

The results of the study showed that the majority (63.3%) of the respondents did not use any hormones for their fatten cattle, (36.7%) of the respondents use growth hormone for their cattle fattening (Table 4.41). Mamun *et al.* (2018) reported that, no respondents in the studied area used growth hormones in the fattening program. Islam *et al.* (2012) found that 70.6% of the respondents used anabolic steroid as growth hormones and rest of them did not use any kind of growth hormones.

USE OF HORMONE

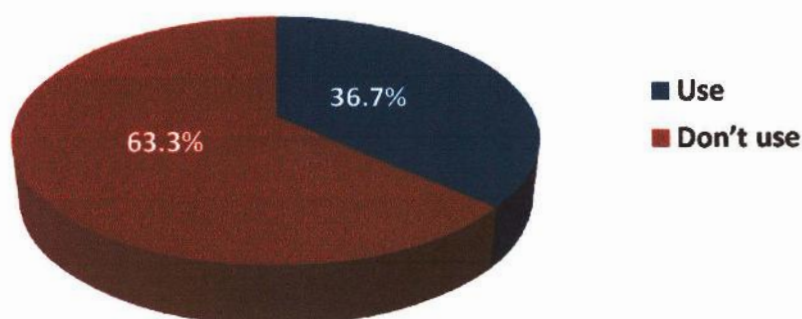


Fig 4.3 Farmers' category according to the use of hormone

Data of the Table 4.45 also indicate that majority (63.3%) of the respondents stated that antibiotics were recommended by local doctors for use in beef cattle fattening and 23.3% cases by the veterinarian and 13.3% by the medical company representative for use antibiotics for cattle fattening.

Table 4.46 Use pattern of antibiotics in beef cattle fattening

Use pattern	Frequency	Percent	Valid Percent
At regular interval	68	75.6	86.1
Immediate before marketing	11	12.2	13.9
Total	79	87.8	100.0
Missing	11	12.2	
Total	90	100.0	

The results of the study showed that, majority the (86.1%) of the respondents applied antibiotics at a regular interval, 13.9% applied antibiotics immediately before marketing for cattle fattening (Table 4.46).

Table 4.47 Feeding pattern of urea molasses straw (UMS)

Feeding pattern	Frequency	Percent	Valid Percent
Yes	2	2.2	2.2
No	88	97.8	97.8
Total	90	100.0	100.0

The results of the study show that majority (97.8%) of the respondents didn't feed UMS and 2.2% of the respondents fed UMS to the fatten cattle (Table 4.47). Similarly, Ahmed *et al.* (2010) reported that 27% of the respondents fed UMS and 51% respondents did not feed UMS to the fatten cattle.

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

Bangladesh is a Muslim country, so there is a festival demand for beef cattle during Eid-ul-Azha. About 1.8 million cattle were sacrificed at this time each year (Sujan *et al.*, 2011). Cattle have become an inseparable and integral part of the agricultural farming and agribusiness system in southwestern region of Bangladesh. Cattle fattening for beef production has become an important business of the small holder farmers in Bangladesh. Cattle fattening is an effective tool for poverty alleviation for the rural poor (Karim *et al.*, 2020). By taking this under consideration, the researchers conducted this study entitled “Identification of Hormone Use Pattern in Beef Fattening in Southwest Coastal Regions of Bangladesh”. Beef cattle farmers were the target beneficiaries. They were selected purposively from 3 target upazila like Dumuria upazila of Khulna, Fakirhat upazila of Bagerhat and Tala upazila of Satkhira districts. Total 90 farmers (30 from each upazila) were selected and provide them technical supports by arranging trainings and visiting their farms at a regular interval.

Socio-economic characteristics of the respondent's cattle farmers were studied. The results indicated that the majority (61.1%) of the respondents was middle aged, 21.1% old aged and 17.8% was young aged. The average age of the respondents in the studied area was 41.46 ± 12.734 . In case of the level of education of the respondents, 46.7% had Secondary level of education followed by Graduate or above (15.6%), Primary (12.2%), Illiterate (12.2%), Higher secondary (11.1%) and 2.2% can sing up only. The majority (66.7%) of the respondents belonged to joined family and 33.3% of the respondents had nuclear family. It was found that only 8.9% of the respondents belong to livestock rearing, 30% mixed agriculture, 33.3% had agriculture and livestock, 10% business and livestock, 6.7% agriculture and business or livestock, 3.3% had day laborer and livestock, 2.2% livestock farmers and service and 2.2% had integrated occupation of livestock, fisheries and business and rest 1.1% belong to others occupations. The majority (57.8%) of the respondents belonged to high income group followed by medium (26.7%) and low annual income group (15.6%). The average annual income of the respondents was BD Tk. 2, 32,333.33 $\pm$ 1, 84,385.10. About 18.9% of the respondents had marginal farm size, 24.4% small, 8.9% landless, 27.8% medium and 20% had large sized farms.

The respondents had average farm size of 113.11 ± 92.18 decimal. The average farming experience of the respondents of Dumuria upazila was higher than other upazilas under study (about 19.5 years). The average cattle farming experience of the respondents of Tala upazila was higher than other upazilas (about 18 year). About 21.1% of the respondents had no farming experience and 53.3% had long term experience of farming. Majority of the respondents (48.9%) had long term experience in cattle farming followed by medium (32.2%) and short-term experience on cattle farming (18.9%). The respondents had average 14.60 ± 10.013 years of cattle farming experience. Majority (64.4%) of the respondents belonged to high annual income from cattle rearing group followed by medium annual income group from cattle (23.3%) and low income (10.0%). The average annual income from cattle rearing was BD Tk. $99,722.22 \pm 86,216.872$. Most of the farmers (86.7%) did not participate any organization on beef fattening and rest 13.3% was participated. Average 58.9% of the farmers received no training on beef fattening and 41.1% had taken short-term training on beef fattening. Majority of the respondents (87.8%) had medium knowledge about cattle rearing, 3.3% had low and 8.9% had high knowledge. Majority of the respondents (66.7%) showed medium positive attitude and 33.3% described as high positive attitude to beef cattle fattening. Most of the respondents (71.1%) purchased cattle for fattening purpose at any time of the year, 20% purchased occasionally and 8.9% reared their own cattle. About 40% respondents sold their cattle during Eid-ul-Azha, 33.3% any time of the year and 26.7% sold their cattle both at any time and Eid. The majority (75.6%) of the respondents provided semi-permanent house for their cattle, 17.8% provided permanent housing system, 3.3% provided bamboo structure and rest 3.3% provided kacha housing system. About 53.3% respondents practiced fattening for more than 1 year, 38.9% fattened for 9-12 months, 5.6% for 3-5 months and rest 2.2% fattened their cattle for the period of 6-8 months. Most of the respondents (90%) vaccinated their cattle regularly, 5.6% occasionally and 4.4% didn't vaccinate their fatten cattle. Majority (63.3%) of the farmers rearing or chose crossbred for fattening purpose and rest 36.7% chose indigenous or deshi cattle for fattening. Majority of the respondents (58.9%) purchased their cattle for fattening and rest 41.1% farmers used their own cattle for fattening. The results revealed that 82.2% respondents practiced artificial breeding method, 13% both natural and artificial methods and 4.4% practiced natural method. Majority of the respondents (87.8%) treated sick animals by local doctors and rest 12.2% by veterinarian. Most of the respondents (96.7%) did not keep any records and

rest 3.3% kept records to their cattle. Among the beef cattle farmers under study, 84.4% was male and 15.6% was female cattle farmers. The majority (76.7%) of the respondents started their cattle fattening business using own money, 16.7% took a bank loan, 5.6% from NGO loan and 1.1% from others sources. Average 41.1% respondents visited upazila livestock offices very rarely, 23.3% occasionally, 2.2% visited frequently and 33.3% didn't visit livestock office. The results of the study showed that 94.4% didn't get appoint any labor and 5.6% appointed labor for their cattle farms. Most of the farmers (83.3%) faced moderately severe problems followed by highly severe (15.5%) and less severe problems (1.1%) during cattle farming. Majority of the farmers (63.3%) didn't use any hormones for their fattening purpose and rest 36.7% farmers used growth hormones. Most (87.8%) of the respondents used antibiotics as growth promoter for fattening cattle and 12.2% didn't use it. Majority of the farmers (97.8%) did not feed urea molasses straw (UMS) to their fatten cattle and only 2.2% farmers fed UMS to the fatten cattle.

5.2 Conclusion

Beef fattening could be the most suitable way to increase the socio-economic status of the poor farmers in terms of their net income. However, proper solutions to the problems mentioned by the farmers can accelerate the development of their socio-economic status. The indiscriminate use of hormones and antibiotics in beef fattening is worrisome as it can accumulate their residue in beef. Continued consumption of beef contaminated by hormones and antibiotics can be a threat to public health.

5.3 Recommendations

Based on the outcome of the study the followings are recommended:

5.3.1 General Recommendations

- I. Scientific cattle fattening method or technology related training program is needed to the cattle farmers.
- II. Farmers need to know about the adverse effect of using hormones and antibiotics in beef fattening on human health.
- III. Proper implementation of Animal Feed Act 2010 is urgent to control of indiscriminate use of hormones and antibiotics in beef cattle fattening.

- IV. District or Upazila offices and organizations concerned about livestock farming or beef fattening should take steps to conduct extension activities properly related to cattle rearing.
- V. Besides, Government, the NGOs should also take initiatives to arrange training programs, provide loan facilities and awareness building.
- VI. High feed cost affects the whole fattening process and profit as well, lowering feed price could play vital role in livelihood development through cattle fattening in southwest coastal area.

5.3.2 Recommendation for Further Research

1. The present research was conducted in only three sub districts of southwestern coastal regions of Bangladesh. Therefore, further researches can be conducted in other coastal and also non-coastal regions of Bangladesh.

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Appendix I

**Agrotechnology Discipline
Khulna University, Khulna**

**Project Title: Promotion of Safe Beef Cattle Fattening Excluding Hormone Application in
South-west regions of Bangladesh**

Project No.: BS 273

**Ministry of Science and Technology
Government of the People's Republic of Bangladesh**

Survey on

Identification of Hormone Use Pattern in Beef Fattening in South-west Coastal Regions of Bangladesh

(Confidentiality will be maintained and all information will be used only for study purpose)

Respondent No.:

Name: Father's/Husband name:

Village: Union:

Upazila: District:

Contact Number:

Independent Variables

A) Personal Information

1) Age of the respondents: Years

2) Educational qualification:

Please mention your educational qualification

- Cannot read and write/illiterate
-Class passed.

3) Family type: a) Nuclear b) Joint (horizontal) c) Extended (vertical)

Family size: Number of family members:

Please mention the number of your family members: a) Male..... b) Female.....

4) Main Occupation:(put ✓)

i. Agriculture/Crop	ii. Livestock (cattle, sheep, goat poultry etc.)	iii. Fisheries	iv. Mixed agriculture (crop + livestock + fisheries)
v. Business	vi. Service	vii. Day laborer	viii. Others (specify, if any)

5) Experience in agricultural farming:years**6) Experience in beef cattle farming/rearing:years****B) Economic information****1) Farm size: Actual total amount of land (ha)**

Please furnish information about your lands according to use

Sl. No.	Use of land	Area of land	
		Local unit	Hectare
1	Homestead		
2	Land under cultivation (please consider the lands given to other and taken from others too)		
3	Total land		

2) Annual family income

Please furnish information about your family income (annual) from different sources.

Sl. No.	Source of income	Amount of Taka
1	Crop farming	
2	Livestock rearing	
3	Fisheries	
4	Business	
5	Service	
6	Day laborer	
7	Others	
	Total	

3) Income from beef cattle farming (Tk. /year): C) Social information

1) Organization participation:

Are you involved in any organization? (put√) a) Yes b) No

If yes, please mention the nature/position and duration of your participation in the following organizations.

Sl. No.	Name of organizations	Nature of participation (with duration)				
		Executive committee officer (3)	Executive committee member (2)	Ordinary member (1)	Not involved (0)	Duration (years)
1	Farmers' committee					
2	School/ Madrashah committee					
3	Mosque/Temple/Church/Pagoda committee					
4	NGO committee					
5	Union council					
6	Youth club					
7	Cricket/Football club					
8	Others					

2) Training:

Have you received any training? a) Yes b) No

If yes, please mention the name of the training with duration you have received from different organizations

Sl. No.	Title of training	Duration	Organization	Venue of training
1				
2				
3				
4				

C) Psychological

1) Knowledge on beef cattle rearing

SL. No.	Questions	Total Marks	Marks Obtained
1	Mention two good breeds of cattle for fattening	2	
2	Mention two rearing problems	2	
3	Mention two diseases of cattle	2	
4	Mention usual time of disease outbreak	2	
5	Mention two medicines for any disease of cattle	2	
6	Mention two vaccines for cattle	2	
7	What is the appropriate time of vaccination	2	
8	What is the main cause of less production of beef cattle	2	
9	Mention two feeds for cattle	2	
10	What type of house is required for cattle rearing	2	
	Total	20	

2) Attitude

a) Positive

Statement	Strongly agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly disagree (1)
Beef cattle farming is easier					
Diseases are lesser than other animals					
Beef cattle farming is profitable than other farming					
Demand for beef in the market is high					
Required minimum feed					

a) Negative

Statement	Strongly agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly disagree (5)
Beef cattle maintenance is very hard					
Mortality rate of beef cattle is very high					
Demand of beef (meat) is low					
Beef cattle are very dirty					
Quality of local beef cattle is poor					

D) Beef cattle related information

1. Number of total cattle:

2. Number of fatten cattle:

3. Breed(s) of fatten cattle:

4. Purchase time: ☐ Any time of the year ☐ Occasionally

5. Selling time: ☐ Any time of the year ☐ During Eid-ul-Azha ☐ Occasionally

6. Age at purchase/beginning of fattening (put √)

☐ 12-18 months ☐ 19-24 months ☐ 25-30 months ☐ 31-36 months ☐ 37-42 months ☐ >42 months

7. Sex of fatten cattle (put √) ☐ Male ☐ Female

8. Duration of the beef cattle fattening program? (put √)

☐ 3-5 months ☐ 6-8 months ☐ 9-12 months ☐ More than 1 year

9. Weight at marketing (put √)

☐ 150 -200kg ☐ 201-250kg ☐ 251 -300kg ☐ 301 -350kg ☐ 351 -400kg

10. Area keep for beef cattle rearing:.....Hectare

11. Housing for beef cattle: Please furnish information of your beef cattle shed

Types of shed	No of sheds
Permanent structure	
Semi-permanent structure	
All bamboo structure	
Kacha	

12. Farming System :(put √)

- Crop
- Livestock
- Poultry
- Fish
- Agroforestry
- Others (specify).....

13. Performance & information about cattle

Sl. No.	Parameters	Value	Comment
1	Age at puberty (days)		
2	Age at first calving (days)		
3	Calving interval (days)		
4	Mortality (%)		
5	Milk yield (kg/d)		
6	Lactation length (days)		
7	No. of services per conception		
8	Post-partum heat (days)		
9	Gestation length (days)		
10	Duration of fattening program (d)		
11	Initial live weight (kg/animal)		
12	Marketing live weight (kg/animal)		
13	Growth rate (g/d)		

14. Information about the availability of bull/semen for breeding of the cattle: (put ✓)

☐ Highly available ☐ Moderately available ☐ Not available

15. Vaccination: (put ✓) ☐ Regularly ☐ Occasionally ☐ Don't vaccinate

16. Feeding:

a) Types of feed(put ✓)

- i. Rice straw
- ii. Urea molasses straw (UMS)
- iii. Green grass
- iv. Leaves
- v. Concentrates
- vi. Others (specify).....

b. Grazing place (put ✓)

- i. Ail
- ii. Pasture land
- iii. Play ground
- iv. Roadside
- v. Fellow lands
- vi. Others (specify).....

c) Grazing hours(put ✓)

- i. 0-4
- ii. 5-8
- iii. 9-12
- iv. >12

17.Type of the fatten cattle: (put ✓) ☐ Crossbred

☐ Indigenous

18. Source of the cattle: put ✓ ☐ Purchase

☐ Own cow

Purchased from:

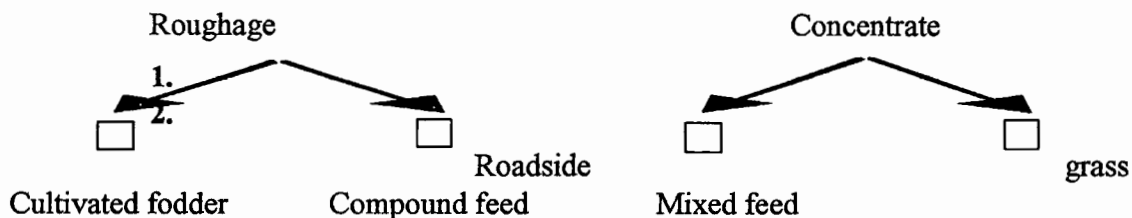
19. Which breeding method do you use? (put ✓)

☐ Natural breeding

☐ Artificial insemination

☐ Both

20. Which type of food do you use?



21. Source of feed: ☐ Purchase

☐ Produce

☐ Both

22. Diseases

Sl. No.	Name of the disease	Time	Comments
1.	Anthrax		
2.	Foot and Mouth Disease (FMD)		
3.	Diarrhea		
4.	Hemorrhagic septicemia (HS)		
5.	Black Quarter (BQ)		
6.	Calf Scours		
7.			
8.			

23. Provide treatments by:

☐ Local doctor ☐ Veterinarian ☐ Others ☐ No treatment

24. Which surgical practice do you use?

☐ Castration ☐ Dehorning ☐ Tail docking ☐ Others

25. Do you keep records regularly?(put√) ☐ Yes ☐ No

26. Caretaker of the beef cattle: ☐ Male ☐ Female ☐ Children

27. What is the source of the capital for purchasing cattle? (put√)

☐ Bank loan ☐ NGO loan ☐ Lending ☐ Others

28. How often do you use to visit Upazila Livestock Office? (put√)

☐ Frequently ☐ Occasionally ☐ Very rare ☐ Never

29. Estimated profit per head:Tk

Dependent Variables

A) Prospect of beef cattle farming

1. Relative advantages

Sl.	Statement	High (3)	Moderate (2)	Less (1)
1.	Short period of rearing			
2.	Demand of beef than other meats			
3.	Special market during Eid-ulAzha			
4.	Medicine requirement			
5.	Mortality of beef cattle than other animal			
6.	Investment in beef cattle farming than other farming			
7.	Feed requirement than other farming			
8.	Cost of housing for beef cattle			
9.	Labor requirement			
10.	Sensitivity to the diseases			
11.	Need of skilled person			
12.	Need of especial training			

2. Poverty reduction

Sl. No	Statement	Highly improved (3)	Moderately improved (2)	Slightly improved (1)	No improvement (0)
1.	How was your economic condition before beef cattle farming?				
2.	How is your economic condition after beef cattle farming?				
3.	How does beef cattle farming help to change the infrastructure of your house?				
4.	How does a beef cattle farming contribute to the education of your children?				
5.	How does a beef cattle farming contribute to your clothing?				
6.	How does beef cattle farming helps to get proper medical treatment of your family members?				

3. Employment generation

Do you appoint any laborer for your farm? a) Yes b) No

If yes

- i. How many laborer do you appoint?
- ii. What types of laborer do you appoint? a) Self b) Hired (temporary) c) Hired (permanent)

4. Income generation

Does your income increase after beef cattle farming? a) Yes b) No

If yes, How much you earn from your farm? per month

If no, Why are you continuing beef cattle farming?

B) Problem faced

Sl. No.	Type of problem	Extent of problem			
		Highly Severe (3)	Moderately Severe (2)	Less Severe (1)	Not at all (0)
A	Breed related problems				
1	High price of good breed				
2	Lack of quality breed in time				
3	Lack of breeding bulls/semen				
B	Feeds & fodder related problems				
5	High price of feeds and fodder				
6	Unavailability of quality feeds and fodder				
7	Lack of knowledge of feed production				
8	Lack of grazing land				
C	Health related problem				
9	High mortality rate				
10	Unavailability of vaccine and medicines				
11	High prices of vaccine and medicines				
12	Lack of veterinary surgeons				
13	Disease susceptibility				
D	Other problems				
14	Lack of artificial insemination facilities				
15	Lack of capital and loan facilities				
16	Lack of marketing facilities				
17	Lack of Govt. support				
18	Lack of training facilities				

C. Hormone related information

1. Do you use growth hormone or any synthetic growth promoter? ☐ Yes ☐ No

2. Who has recommended you to use synthetic growth promoter?

☐ Local doctor ☐ Veterinarian ☐ Medicine company representatives ☐ Others

3. When do you apply hormones?

☐ At a regular interval ☐ Immediate before marketing ☐ Occasionally ☐ Don't use

4. Application pattern of hormone

Name of hormone used	Generic name	Dose of hormone used	Frequency of application	Form of hormone (injection/tablet/powder/liquid)	Age of cattle	Application procedures (with feed/water/orally/injection)
1. Decason						
2. Oradexon						
3. Prednisolon						
4. Betnenal						
5. Cortan						
6. Steron						
7. Adam-33						
8. Perinatin Vita						
9.						
10.						
11.						
12.						

5. Is there any adverse effect of applying hormones in beef fattening? ☐ Yes ☐ No

6. What kinds of negative impacts of using hormones in beef fattening?

☐ No negative impact ☐ Obesity ☐ Carcinogenic ☐ Breast cancer ☐ Early child maturity

- ☐ Affect liver and kidney ☐ High blood cholesterol ☐ Psychological malfunction
☐ Others..... ☐ Don't know

D. Antibiotics related information:

1. Do you use antibiotics as growth promoter? ☐ Yes ☐ No

2. Who has recommended you to use antibiotic growth promoter?

☐ Local doctor ☐ Veterinarian ☐ Medicine company representatives ☐ Others

3. When do you apply antibiotics?

☐ At a regular interval ☐ Immediate before marketing

4. Application pattern of antibiotics

Name of antibiotics used	Generic name	Dose of antibiotics used	Type of antibiotics application (injection/tablet/powder/liquid)	Age of cattle	Application procedures (with feed/water/orally/injection)
1. Trimamide, Sulfa-3 etc	Sulfapynicline, Sulfadimidine, Sulfadiazom				
2. Steptosalfa, Strinacine etc	Do with Steptomycin				
3. Diadin	Sulfadimidin				
4. Ciprocine vet	Ciprofloxacin				
5. Cotrim vet	Sulfamethaxazole				
6. Marbo vet	Marbofloxacin				
7. Renamycin Inj.	Oxitetracycline				
8. Dexa-SP	Procaine penicillin, Dihydrostreptomycin, Dexamethasone				
9. Gentaren, Genacyn, Getabac etc	Gentamycin				
10. Fimox DS vet	Amoxicillin				
11. Steptopen vet	Procaine benzylpenicillin, Benzyl penicillin, Steptomycin				

12. Dimi-vet	Sulphadimidine				
13.					
14.					
15.					

5. Is there any adverse effect of applying antibiotics in beef fattening? ☐ Yes ☐ No

6. What kinds of negative impacts of using antibiotics in beef fattening on human health?

☐ No negative impact ☐ Drug resistance ☐ Failure of antibiotic therapy in clinical situations ☐ Carcinogenic ☐ Toxicity in human ☐ Early child maturity
☐ Others..... ☐ Don't know

E. Urea molasses straw (UMS) related information:

1. Do you know about urea molasses straw (UMS)? ☐ Yes ☐ No

2. Do you feed UMS to fatten cattle? ☐ Yes ☐ No

3. How much UMS do you feed per cattle per day?kg

4. Attitude about UMS

a) Positive

Sl	Statement	Highly agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Highly disagree (1)
1.	UMS feed is a suitable technology for beef fattening					
2.	UMS preparation is easier					
3.	Ingredients for UMS preparation are cheap and available					
4.	Cattle prefer it to eat					
5.	UMS is economic to feed beef cattle					
6.	UMS enhance growth of beef cattle					
7.	No side effect of UMS feeding					