PRESENT SCENARIO OF USING FEED ADDITIVES DURING CATTLE FATTENING IN DHAKA DISTRICT OF BANGLADESH

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JUNE, 2019

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A Thesis

Submitted to the Faculty of Animal Science and Veterinary Medicine

Sher-e-Bangla Agricultural University, Dhaka,

in partial fulfillment of the requirements
for the degree of

MASTER OF SCIENCE (MS)
IN
ANIMAL SCIENCE

SEMESTER: JANUARY- JUNE, 2019

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CERTIFICATE

*This is to certify that thesis entitled "**PRESENT SCENARIO OF USING FEED ADDITIVES DURING CATTLE FATTENING IN DHAKA DISTRICT OF BANGLADESH**" submitted to the Department of Animal Production and Management, Faculty of Animal Science & Veterinary Medicine, Sher-e-Bangla Agricultural University, Dhaka-1207, in partial fulfillment of the requirements for the degree of Master of Science(MS) in Animal Science, embodies the result of a piece of bona fide research work carried out by **Md. Uzzal Hossain,** Registration No.:**12-04735** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.*

I further certify that any help or source of information, as has been availed of during the course of this investigation has been duly acknowledged.

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ACKNOWLEDGEMENTS

At the beginning, the author bows the grace and mercy of the "Almighty Allah", the omnipresent, omnipotent and omniscient, who enabled him to complete this research work successfully.

The author with a sense of respect, expresses his heartfelt gratitude to his Supervisor ***Assistant Professor Md. Mahabbat Ali,*** *Department of Animal Production and Management, Sher-e-Bangla Agricultural University, Dhaka for his untiring and painstaking guidance, invaluable suggestions, continuous supervision, timely instructions, inspirations and constructive criticism throughout the tenure of research work.*

Heartfelt gratitude and profound respect are due to his Co-supervisor ***Professor Dr. Md. Jahangir Alam,*** *Department of Animal Production and Management, Sher-e-Bangla Agricultural University, Dhaka for his co-operation, constructive criticism, and valuable suggestions for the modification and improvement of the research work.*

The author is especially grateful to his ***Associate Professor Dr. Md. Saiful Islam,*** *Chairman, Department of Animal Production & Management for his advice and sincere co-operation in the completion of the study.*

The author is deeply grateful to his respected and honorable teachers Professor Dr. Md. Anwarul Haque Beg, Department of Poultry Science for his kind help, advice and co-operation in the completion of the study. Profound thanks and heartiest gratitude to his respected and honorable teachers Assistant Professor Hasan Mohammad Sammy, Department of Agricultural Statistics, Sher-e-Bangla Agricultural University-1207, Dhaka for his valuable advice and help at various steps of this work.

The author is also boundless grateful to all the staffs of the Department of Animal Production and Management, Sher-e-Bangla Agricultural University for their co-operation.

The author express his grateful acknowledgement and indebtedness to his beloved parents, whole family and friends for their love, blessings, prayers, sacrifices, moral support and encouragement a lot in the process of building the academic career which can never repaid.

The Author

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ACRONYMS AND ABBREVIATION

ABBREVIATION	ACRONYMS
ADI	Acceptable Daily Intake
BAU	Bangladesh Agricultural University
BBS	Bangladesh Bureau of Statistics
BDT	Bangladeshi Taka
BLRI	Bangladesh Livestock Research Institute
DEX	Dexamethasone
DES	Diethyl Stillbesterol
DLS	Department of Livestock Services
DM	Dry matter
et al.	et alia (and others)
EU	European Union
FAO	Food and Agricultural Organization
FCE	Functional Capacity Evaluation
FDA	Food and Drug Administration
GDP	Gross Domestic Product
GH	Growth Hormone
gm	Gram (Unit of Measurement)
HGP	Hormone Growth Promotants
JECFA	Joint Expert Advisory Committee on Antibiotic Resistance
Kg	Kilogram
MRL	Maximum Residue Limit
N	Nitrogen
NGO	Non Government Organization
NOAH	National Office of Animal Health
NS	Non Significant
SYN	Synovex
UK	United States
USA	United States of America
UMS	Urea Molasses Straw
%	Percentage

PRESENT SCENARIO OF USING FEED ADDITIVES DURING CATTLE FATTENING IN DHAKA DISTRICT OF BANGLADESH

ABSTRACT

This study was conducted to find out the relationship among different aspects of cattle fattening and use of anabolic steroids and feed additives. The data were collected through an interview schedule from 65 respondents of 4 upazila/ thana (Mohammadpur, Keraniganj, Jatrabari and Mirpur Thana) of Dhaka city who were involved in cattle fattening. Parameters were studied in relation to socio-economic conditions of farmers and use of anabolic steroids and feed additives and their effects on animals and environment. In this study 80.0% farmers' were involved in others occupation, followed by 17.0% in livestock business. About 65.0% respondents had higher education, 20.0% had higher secondary education, 12.0% obtained secondary education and the rest of them were primary education. Irrespective of literacy only 6.0% of the farmer had training on cattle fattening. Results showed that about 92.0% respondents used anabolic steroids for the duration of 3 to 6 months long cattle fattening ($P<0.001$) program. The chi-square value of annual income indicates the higher of annual income that the uses of anabolic steroids have increased. The significant ($P<0.01$) association was observed in case of anabolic steroids and source of money, annual income, number of cattle fattening, breeds, fattening period, starting and finishing age. About 95.0% respondents used feed additives for cattle fattening from own resources ($P<0.001$) and most of cattle fattened for 3 to 6 months ($P<0.01$). The result demonstrated that respondents of high annual income used more anabolic steroid and feed additives as a growth promoter for cattle fattening.

CHAPTER I

INTRODUCTION

Livestock and meat products have been among the best ever increasing components of the global agriculture and food industry. Cattle of Bangladesh are an inalienable and integral part of the agricultural farming and agribusiness system. The livestock section has been contributing a considerable branch to the economy of Bangladesh. About 24.86 million cattle heads are circulated all over the country which is 12th in the world and 3rd in Asian countries (DLS, 2017). The subdivision also acting a important function in the national economy which contributes about 45.0% of the agricultural GDP, 13.62% of the total GDP and has generated an estimated 31% of the total agricultural employment. Even if cattle population per unit land area is high, their output is too low due to insufficient feed supply, poor genetic makeup, insufficient provision of veterinary care, lack of scientific awareness in housing and management. Although the growth of livestock production is the highest among all other sub-sectors of agriculture in Bangladesh (Bangladesh Economic Reviews, 2017), the production and consumption of livestock products is still much lower in comparison with other countries. Among meat utilization pattern of meat of 180 countries in the world that was tabulated by FAO, Bangladesh is in the 18th position in meat consumption the amount of which is about only 44.57 kg/capita/year (DLS, 2018ss) compared to the USA of 124 kg and the global average of 38 kg (Smith *et al.*, 2007). Besides, being a Muslim country, there is a seasonal demand of beef cattle during Eid-ul-Azha. To assure the animal protein necessity, cattle fattening can play a significant role. The Directorate of Livestock Services (DLS) of the Government of Bangladesh has taken beef fattening as an action program to generate income for the rural poor farmer. Cattle are bought by the farmers usually 3-6 months before Eid-ul-Azha (Muslim festival). One of the advantages of the cattle fattening

by the rural farmers is that they use locally available cattle feed resource during the Eid festival. The shortage and high cost of animal feed is the greatest problem of the farmers for rearing cattle. During 1999-2000, large scale cattle fattening farms were started through finance by Sonali Bank, Janata Bank, Agrani Bank and Bangladesh Krishi Bank. Hossain *et al.* (2004); conducted another experiment to know the effect of Urea Molasses Straw (UMS) feeding on feed intake and growth of the young bull at farmer's level. According to Skunmun *et al.* (2002); the increasing trends of beef demand have already been evident in several Southeast Asian countries such as Indonesia, Malaysia, Philippines and Thailand. Though the cattle production per area is high, their productivity is low due to genetic potentiality and lack of scientific knowledge in management strategies (Rahman *et al.*, 2009).

Growth stimulating substances e.g., hormones, steroids, feed additives etc., are lawfully or unlawfully using in Bangladesh for cattle fattening. Some researches in BAU and BLRI have conducted experiments on growth, feeding trial and socio-economic aspects of cattle fattening. According to the National Office of Animal Health (NOAH, 2001), antibiotics and growth promoters are used to help growing animal digest their feed more proficiently, get utmost benefit. Buet *et al.* (2000); reported that antibiotics in sub-therapeutic dose are the safest and most useful growth-promoters with regards to human and animal health and allied bacterial resistance problems. Francois and Michel (1968), reported that the antimicrobial agents that are used as feed additives build up their movement in the digestive tract.

A scientific agreement was also adopted to prohibit the use of stilbenes owing to their potential tumor-inducing effects in human. However, most of these compounds have not gained widespread consumer acceptability and growth-promoting hormones were banned by the EU. As noted by Maghuin-Rogister *et al.* (1991); some consequences are also a disloyal competition between European meat producers themselves or with other countries where anabolic compounds are

legally accepted. The myotropic actions of anabolic steroids result from their ability to increase retention of dietary nitrogen through protein synthesis. Steroids hormones may act in different ways; firstly, via specific cell receptors; secondly, by enhancing endogenous somatotrope hormones and finally, by modulation of other endocrine system like gonadal, thyroid and surrenal axis.

Antibiotics, steroids, appetizers, vitamin-mineral premix, mineral premix, enzymes etc are the types of feed additives and growth promoters used by different farmers. Nowadays the consumers have become very concern about food safety, and their fear relating to the use of antibiotic /hormone /drugs in animal feeding has been widely expressed worldwide. Since, 2001 EU before now forbidden the use of growth promoter in cattle production. If the cattle are too weak then they might be given limited dose of vitamin B-12 injections. But high dose steroids injections are often push to cattle body to make them look fat and healthy as unfair traders due to earn extra income.

At present, the government encourages the promising of commercial fattening practices and support establishments of the segment in an investment form in the study area. Hence, it is very significant to look into the overall activities and performance in the segment to drawing suitable technologies for upgrading of beef production.

Observance all these matters in vision, the present study was conducted with the following objectives:

i) To look into the utilize of anabolic steroids and feed additives for cattle fattening in Dhaka city of Bangladesh;

ii) To discover the association among different aspects (human health effect, environmental effect, legalism etc) of cattle fattening and use of anabolic steroids and feed additives;

iii) To make a record of the use of hormones and feed additives in cattle fattening areas;

iv) To monitor public awareness on overall fattening concept.

CHAPTER II

REVIEW OF LITERATURE

The motive of this section is to provide a selective review of previous and recent research works which are related to this work. A few numbers of research works have been done to monitor the availability of growth promoters with their composition and other advantageous property in beef cattle production in Bangladesh. However, some important allied result of research carried out in this country or somewhere else is reviewed in this subdivision. For easy to elucidate the reviews are divided into quite a few sections.

In view of the fact, that the 1950s, the Food and Drug Administration (FDA) has permitted a number of steroid hormone drugs for use in beef cattle and sheep, as well as natural estrogen, progesterone, testosterone and their imitation versions. These drugs boost the animals' growth rate, the competence by which they renovate the feed they eat into meat, and the leanness of their meat. The FDA approves these drugs only after broad studies have revealed that the food from the treated animals is sale for people to eat, and that the drugs do not impairment the treated animal or the environment. The drugs also have to work as intended.

These steroid hormone drugs are formulated as pellets that are placed under the skin on the back side of the animals' ear. The pellets dissolve slowly under the skin and do not require removal. The ears of the treated animal are discarded at slaughter and not used for human food. Using scientific data, FDA establishes the acceptable safe limits for hormones in meat. A safe level for human consumption is a level of drug in the meat that would be expected to have no effect in humans based on extensive scientific study and review.

2.1 Beef cattle production system in Bangladesh

In Bangladesh, livestock normally lives on fibrous and crop by-products indigestible to human beings. Livestock alter low quality feeds into high quality food (meat, milk and eggs) for human utilization. Feed resources for animal are resulting from crop residues, and cereal by-products as well as grasses, tree leaves and aquatic plants. The animals scavenge for grasses or any feeds that may be existing on the non-cultivated areas along with wayside and bunds. The mass of the roughage for livestock feeding consists of rice straw, wheat straw, wayside grasses, agricultural weeds, aquatic plants tree fodder. Water hyacinth, banana leaves and sugarcane tops also make up a green addition with straw based diet as and when presented. Very slight grains are accessible for feeding livestock in the country. About 2 kg of straw is obtainable per head per day and supplementation is inadequate to about 1 kg of green fodder with minor quantities of cereal and oilseed by-products (Saadullah, 1995). Concentrate consists of rice bran; wheat bran, oil cakes, pulse bran, molasses, cotton seed cake and some cases fish meal contribute 6.8% of the total dry matter.

At this time situation temporary basis as per example small scale fattening purpose farmers are using anabolic steroid and feed additives as per recommendation level to get more productivity from fattened animal. Antibiotics are repeatedly used in the food production method as a technique to manage the development of potentially hurtful bacteria. Prospective earnings from the use of antibiotics include the avoidance of diseases; add to food and water uptake, and increase the digestive effectiveness of the animal.

2.2 Naturally occurring hormone

Some of the permitted drugs are naturally produced during life in people and animals, such as estradiol (estrogen), progesterone and testosterone. These natural hormones are needed for usual development, growth and reproduction. People are not at risk from eating food from animal treated with these drugs because the

amount of supplementary hormone following drug conduct is very small compared with the amount of natural hormones that are in general found in the meat of untreated animals and that are naturally produced in the human body.

The preparation procedure comprises incorporation 1 kg straw cut into 2-3 inch pieces with 700 ml water, 225 gm molasses and 30 gm urea. After observance the mixture in a clogged container for eight days it should be dried in the sun to make it prepared for use as fodder. If the cattle traders and farmers follow the procedure recommended by the livestock department, cattle may gain up to one and a half times weight uniformly within six months and consumption of their meat is safe for human health, Shamsul Alam, upazila livestock officer in Jaldhaka.

2.3 Synthetic hormones

Some of the permitted drugs are artificial versions of the natural hormones, such as trenbolone acetate and zeranol. Just like the natural hormone implants, before FDA approved these drugs, FDA requisite widespread toxicological testing in animals to settle on safe levels in the animal products that we eat (edible tissue). Moreover, FDA necessary that the manufacturers reveal that the quantity of hormone left in each edible tissue following dealing is below the proper safe level.

As per the government's livestock department suggestions for fattening cattle, the animals should be dewormed and then fed with 2-25 kg of specially prepared mixture of Urea Molasses and Straw (UMS) daily for a period of six months along with other balanced food, said Rangpur District Livestock Officer Sekender Ali. No steroid hormones are approved for growth purposes in dairy cattle, veal calves, pigs or poultry. All of the steroid hormone growth-promoting drugs are available for over-the-counter purchase in the U.S and are generally given by the livestock producer at specific stages of the animals' growth.

2.4 Feed additives and anabolic steroids

Church and pond (1988), defined feed additives as food ingredients of a non-nutritive character that excite growth or other types of performance, progress the effectiveness of feed consumption, or may be advantageous to the health or metabolism of the animal. Numerous of the compounds scheduled as feed additives would be classified as drugs (a substance used as a medicine). Frequently used feed additives, of which lots of are antimicrobial agents or compounds that comprise antibiotics, antibacterial agents, and antifungal agents. At times hormones are used as growth promoters. Growth stimulators may be feed additives, but may also include such things as some hormones or hormone similar to chemicals that may be administered subcutaneously or intramuscularly relatively than orally.

Song and Choi (2001), described some growth promoters and their effects on beef production. For the improved performance in growth and enhancement of feed effectiveness use of growth promoters by means of implantation or supplementation to the diets has been the schedule practice in beef cattle production in many countries.

W.M. Beeson (1959), described feed additives in relation to definition are not a nutrient. They may spare nutrient or improve the deployment of nutrients, but no evidence is presented to show that additives substitutes for vital energy, protein, vitamins, minerals and anonymous growth factors. Intermittently livestock feeders are inadvertently led to consider that a certain feed additive will substitute many of the sound practices concerned in appropriate nutrition, executive and disease manage. Throughout the last decade, many feed additives were obtainable as antibiotics, enzymes and probiotics, to improve the growth performance, dietary parameters and carcass tarits (El hosseiny, 1999 and Allam *et al.*, 2001). Feed additives are broadly used to facilitate raise body weight increase of farm animals, mainly those species recognized with their slow growth rate. However, variance outcome were obtained.

2.4.1 Feed additives

Pharmaceutical or dietary substances that are not usual feedstuffs are together with made-up and stored feed for diverse purposes, predominantly to control communicable disease or to advance growth. Unseemly use may cause poisoning in the issue animals or detrimental residues in food for human utilization shaped by the animals. The use of additives in this technique is firmly controlled by legislation in most countries. A few of them necessitate a recommendation by a veterinarian to fulfill with local poisons laws.

2.4.2 Growth promoters

A synthetic material or agent that is included to the feed in order to make the most of growth of animals or that is useful to a plant to amend its growth. Antibiotics are used in the cattle industry for remedial purposes where they are used in the treatment of infections, prophylactically for disease avoidance and as growth promoters. The latter means that there is an increased competence of feed use, where growth is stirred with less feed. Eventually, this results in reduced expenses for cattle producers, and for consumers. For artificial fattening, fraudulent traders push 25-30 ampoules of high dose steroid injections like Oradexon and Decason into cattle body within two to three months said several cattle farmers and traders.

2.4.3 Antibiotics as growth promoters

The term “Antibiotics as growth promoters” is used to explain any medication that destroys or inhibits bacteria and is administered at a small, sub-therapeutic dose. The use of Antibiotics for growth promotion has arisen with the strengthening of livestock farming.

Infections agents lessen the yield of farmed food animals and, to manage these, the administration of sub-therapeutic antibiotics and antimicrobial agents has been shown to be efficient. According to National Office of Animal Health (NOAH, 2001), antibiotic growth promoters are used to “help growing animals digest their

food more proficiently, get utmost benefit from it and permit them to widen into strong and healthy individuals". Although the mechanism underpinning their action is unclear, it is believed that the antibiotics restrain responsive populations of bacteria in the intestine. If the microbial population could be better controlled, it is likely that the lost vigor could be diverted to growth.

The endocrine control of growth (here defined as skeletal growth and protein synthesis in muscle) involves the complex interaction of several hormones with nutrient supply, genetic potential and environment. Although many of these interactions are poorly defined, there is little doubt that pituitary growth hormone is essential for the normal growth of young mammals. Since the 1930s, it has been known that hypophysectomy caused rats to stop growing and lose considerable quantities of body protein but it has not until 1964, twenty years after his isolation of pure bovine GH (Li and Evans, 1944), that Tindal and Yokoyama (1961a; 1964b), demonstrated a similar effect in a ruminant.

2.4.4 Antimicrobials as growth promoters

Francois and Michel (1968), reported that the antimicrobial agents that are used as feed additives extend their activity in the digestive tract. They control competitively undesired microorganisms that activate nutrients and produce injurious or noxious substances. The consequence is the finest environment for the intestinal mucosa, which allows a proficient nutrient absorption. Consequently, nutrient consumption, feed conversion ratio and growth rate are in the majority cases enhanced. Additionally, the health statues of animals that are reared beneath sub-optimal circumstances become healthier. The outcome of antibiotics is well-known in young rising animals predominantly beneath antagonistic climatic and management conditions. When animals get older, the beneficial effect is reduced and can often not be observed in the finishing period.

2.4.5 Hormones as growth promoters

Hunter (2010), reported that the use of hormones as growth promoters to increase growth rates is a widespread practice in the Australian beef cattle industry with around half of both grain-feed (feedlot) cattle and northern Australia pasture-fed cattle implanted. Grain feeding cattle in feedlots in combination with the use of Hormone Growth Promotants (HGP) is considered in efficient way of producing beef of consistent taste, tenderness and color to suit customer demand. Pasture fed cattle in northern Australia may be given HGP to ensure that steers meet the high value beef market specifications before pasture quality decreases and this market access is lost.

Thomke and Elwinger (1998), hypothesized that cytokines released during the immune response may also stimulate the release of catabolic hormones, which would reduce muscle mass. Therefore a reduction in gastrointestinal infections would result in the subsequent increase in muscle weight. The mechanism of actions and the result of the use of hormones as growth promoters is an improvement in daily growth rates between 1 and 10% resulting in meat of a better quality, with less fat and increased protein content. There can be no doubt that growth promoters are effective. On the other hand, Gaughan (2005), suggested that cattle with just an oestrogen implant could be adversely affected by hot climatic conditions, takes an additional significance, managing heat load in feedlot cattle is crucial to their welfare and, in hot climates, the use of such implants should be carefully considered. Furthermore, frequent, long-term doses of dexamethasone have caused a semi-permanent state of insulin resistance; administration of dexamethasone over long periods of time also generates other adverse side-effects commonly associated with glucocorticoids, such as compromised immunity, increased blood pressure and lowered threshold for seizure (Binnert *et al.*, 2004). The use of intramuscular injections in beef cattle at several intervals prior to slaughtering and the result found improvements of the

number of cattle as per grading choice. The research provided an additional model for studying ways to manipulate intramuscular fat in beef cattle (Brethour, 1972).

On the other hand, the 32nd JECFA (Joint Expert Advisory Committee on Antibiotic Resistance) report (1988), on which the codex standards are based, concluded that residues arising from the use of testosterone and oestradiol- 17 as a growth promoter in accordance with good animal husbandry practice are unlikely to pose a hazard to human health and that the amount of exogenous progesterone ingested in meat from treated animals would not be capable of exerting an hormonal effect, and therefore, any toxic effect, in human beings. Since, according to JECFA, the potential toxic effect of residues of these hormones is directly related to their hormonal effect, the report concluded that the additional residue levels in treated animals are not capable of exerting any toxic effect. On the basis of this safety assessment and the difficulty of determining the levels of residues of these hormones for growth promoting purposes in cattle JECFA (Joint Expert Advisory Committee on Antibiotic resistance) concluded that it was "unnecessary" to establish an ADI (Acceptable Daily Intake) or MRL (Maximum Residue Limit) for these hormones.

In cattle the use of hormones is limited to veal calves and beef cattle. Veal calves are produced mainly in continental Europe, to an extent of about 8 million per year. Research has demonstrated that hormone treatment improves growth rate, nitrogen retention and FCE during the 5-6 weeks period before slaughter. Beef cattle, including steers as well as heifers, were treated in large numbers, especially in the USA and the UK, with DES or hexoestrol, administrated orally, until the use of these compounds was restricted. During the last several years, practice has changed dramatically in the direction of increased use of implants of natural steroids, synthetic steroids and the phyto-oestrozenzeranol.

According to the European Union's Scientific Committee on Veterinary Measures Relating to Pi Health, the use of six natural and artificial growth hormones in beef

production poses a potential risk to human health. These six hormones include three which are naturally occuring- Oestradiol, Progesterone and Testosterone and three which are synthetic- Zeranol, Trenbolone and Melengestrol.

So far, almost all concern about the use of hormones has focused on whether trace residues of these hormones in the meat have human health consequences. But there's another way that these powerful agents can be find their way into people and other animals. A substantial portion of the hormones literally passes through the cattle into their feces and ends up in the environment, where it can get into other food and drinking water. Since 1988, concerns about the potential health risks of drug residues have lead the EU to ban importation of the meat of hormone treated animals. The United States and Canada, which produce such meat, have vigorously fought the ban through both punitive tariffs on various imports from Europe and appeals to the World Trade Organization. The EU has expressed hope that new research will provide scientific grounds to rebut these challenges to its ban.

2.4.6 Steroids as growth promoters

Steroids cause buildup of much fluid in animal body, making them appear fatter. But as this fluid spread all over the body, the animals' immune system is affected and they become susceptible to tedious diseases. According to K. Becker steroids (also called prednisone, cortisone or the nondescript "allergy shot") are the least optimal treatment choices, as they work suppressing your pet's immune system. Steroids really turn the immune system off, which improves the symptoms astonishingly fast but doesn't talk to the root issue of why your pet's immune system is in excess of reacting in the first place. Not only can steroids have a negative effect on your pet's liver, adrenal glands and kidney, but suppressing your pet's immune system with steroids also allows for opportunistic yeast and bacteria to develop on your pet's skin, from time to time growing the probability that antibiotics may be prescribed. Shawn Messonnier described corticosteroids

(steroids) such as prednisone and prednisolone are recurrently used when treating allergic dogs and cats. Chronic steroid use has many adverse effects that can injure your pet and low doses for short periods can be done carefully devoid of impairment to Molly. On the other hand, the natural alternatives would be improved choices to help manage her itchy skin.

M. Richold (1988), reported that Trenbolone, a synthetic androgen is used as a growth promotant in animal husbandry. Because of its steroidal configuration and properties it has been lengthily evaluated in a series of in vitro and in vivo assays to evaluate its genotoxic and initiating properties. Both the close relative molecule 1 7-beta-hydroxy-trenbolone and its metabolic 1 7-alpha-hydroxy-trenbolone, formed only in cattle, have been tested, 1 7-beta-hydroxy-trenbolone was not genotoxic.

Won Mo *et al.* (1998); in an experiment rooted growth promoters (zeranol 36 mg or progesterone 200 mg+ oestradiol benzoate 20 mg) at 8, 11 and 14 months of age in Hanwoo steers. Daily feed intake in growth promoter treatments was higher (6.2 and 6.4) than in the control (5.7) throughout the finishing period. On the other hand Rumsey et al. (1999a) found that DM intake for SYN-implanted steers was higher ($p<0.01$) than for steers not implanted (9.2 and 8.5 kg/day) irrespective of the diet supplemented with roasted soybean or soybean meal.

RBR (1987), reported that Hereford steers shows a positive response in increasing growth rate which were implanted with Synovex-S (oestradiol plus progesterone). Keane (1988), conducted an experiment on evolution of Implix BM and Revalor as anabolic agents for finishing beef steers. Friesian steers were implanted twice at an interval of 70 days with 20 mg oestrdiol plus 200 mg progesterone (Implix BM), 20 mg oestradiol plus 200 mg progesterone (Synovex-S), Implix BM plus BM plus Finaplix, Synovex-S plus Finaplix, or 20 mg oestradiol plus 140 mg trenbolone acetate (Revalor). Compared with the control group, treatments increased body weight gain by an average of 4.0, 55.2, 66.9, 58.9 and 61.8 kg respectively. Smith *et al.* (1999); seven sequences of growth promotant implants

in special fed intact male Holstein veal calves and concluded that the implants increased growth rate of the bull calves by approximately 50% as observed in beef type steers or heifers.

Rumsey *et al.* (1999b); conducted an experiment on beef steer, evaluated to study the influence of implanting with the oestrogenic growth promoter, Synovex-S (SYN, 20 mg oestradiol benzoate and 200 mg progesterone). Final live weight averaged 480.4, 498.5 and 500.7 kg greater ($P<0.01$), for SYN-implanted steers than for steers not implanted. Lopez and Vazquez (1983), stated that crossbred zebu steers, were implanted with 24 mg oestradiol-17beta. Steers were grazed, and given supplements of minerals and bone meal. Daily gains during the 210days experimental period averaged 530 gm for treated steers and 460 gm for controls, the difference between the groups being significant. Groenwegan *et al.* (1990); observed that male Holstein calves were injected were Bovine Somatotropin(BST) at 0.1 mg/kg body weight, feed conversion efficiency was similar in treated and control calves.Hunter *et al.* (2001); in their study, steers were allocated to one of 12 treatment groups; 2 implant strategies x 3 live weights at slaughters x 2 nutritional finishing strategies. The implant strategy resulted significantly ($P<0.05$) heavier weights. Carcass composition was not considerably customized by treatment with oestradiol.

2.4.7 Vitamin-mineral premix as growth promoters

Jame Parish and Justin Rhinehart declared vitamins and minerals give a reason for a very minute part of on a daily basis dry mater intake in beef cattle feeding and can occasionally be overlooked in a herd nutritional course. Although vitamins and minerals are essential as a very small quantity of dietary nutrients, they are tremendously momentous in beef cattle nutritional line up for appropriate animal function such as bone development, immune function, muscle contraction and nervous system function. Cattle growth and reproductive performance can be compromised if a superior mineral program is not in place.

CHAPTER III

MATERIALS AND METHODS

3.1Methods of data collection

The data were collected on the basis of purposive discussion involving 65 respondents of Mohammadpur (Beribadh), Keraniganj, Jatrabari and Mirpur area of Dhaka District in Bangladesh. These farmers were involved in beef cattle fattening program.

3.2 Study area

The proposed research was carried out for 90 days during 3rd May, 2018 to 1st August, 2018, in Dhaka City, Bangladesh.

Table 1. Name of the district, upazila and number of the respondents who were involved in experimental area

	Upazila/ Thana	**No. of Farmers**
Dhaka	Mohammadpur	30
	Keraniganj	9
	Jatrabari	16
	Mirpur	10

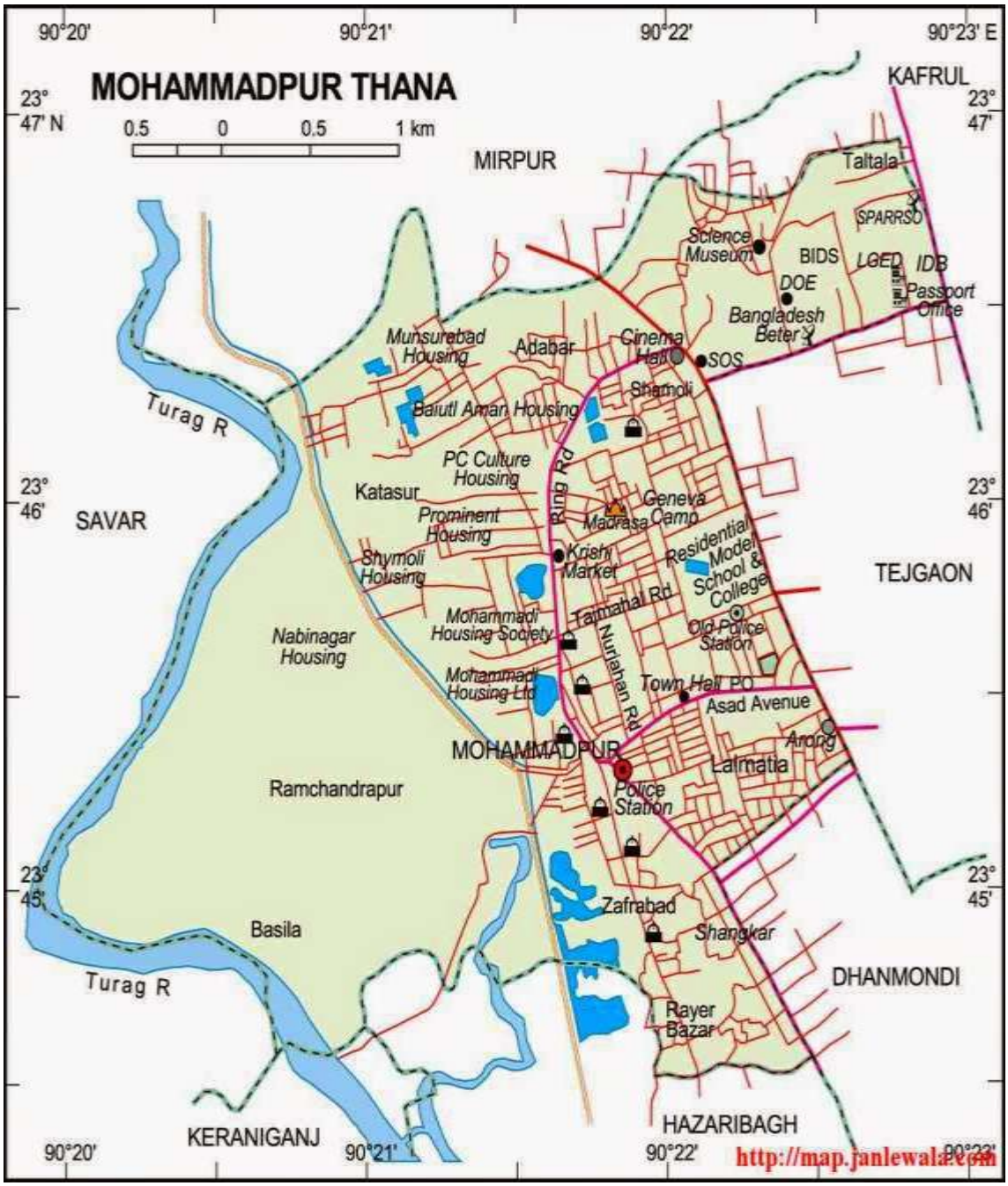

Figure 1. Map of the study area in Mohammadpur Thana.

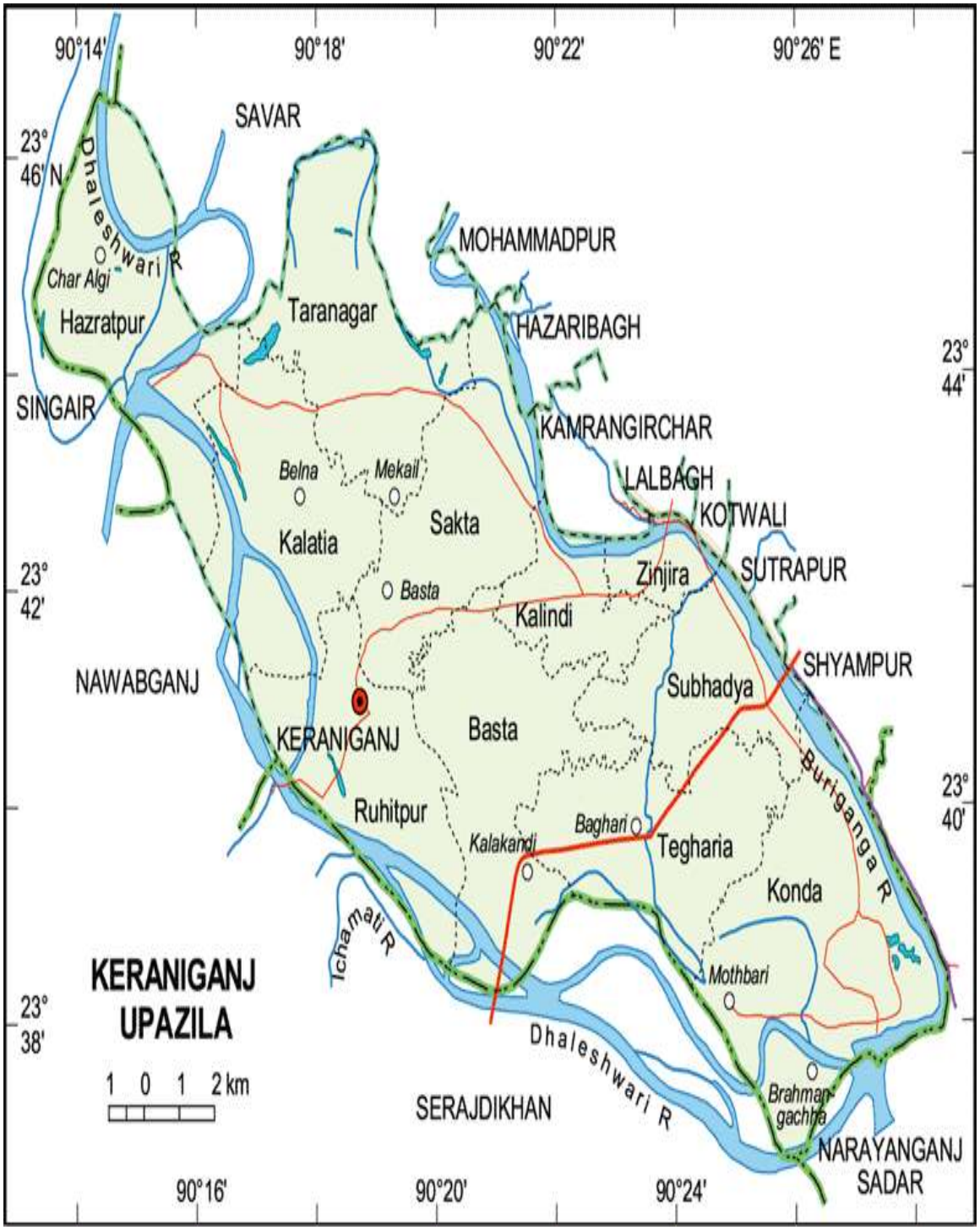

Figure 2. Map of the study area in Keraniganj Upazila.

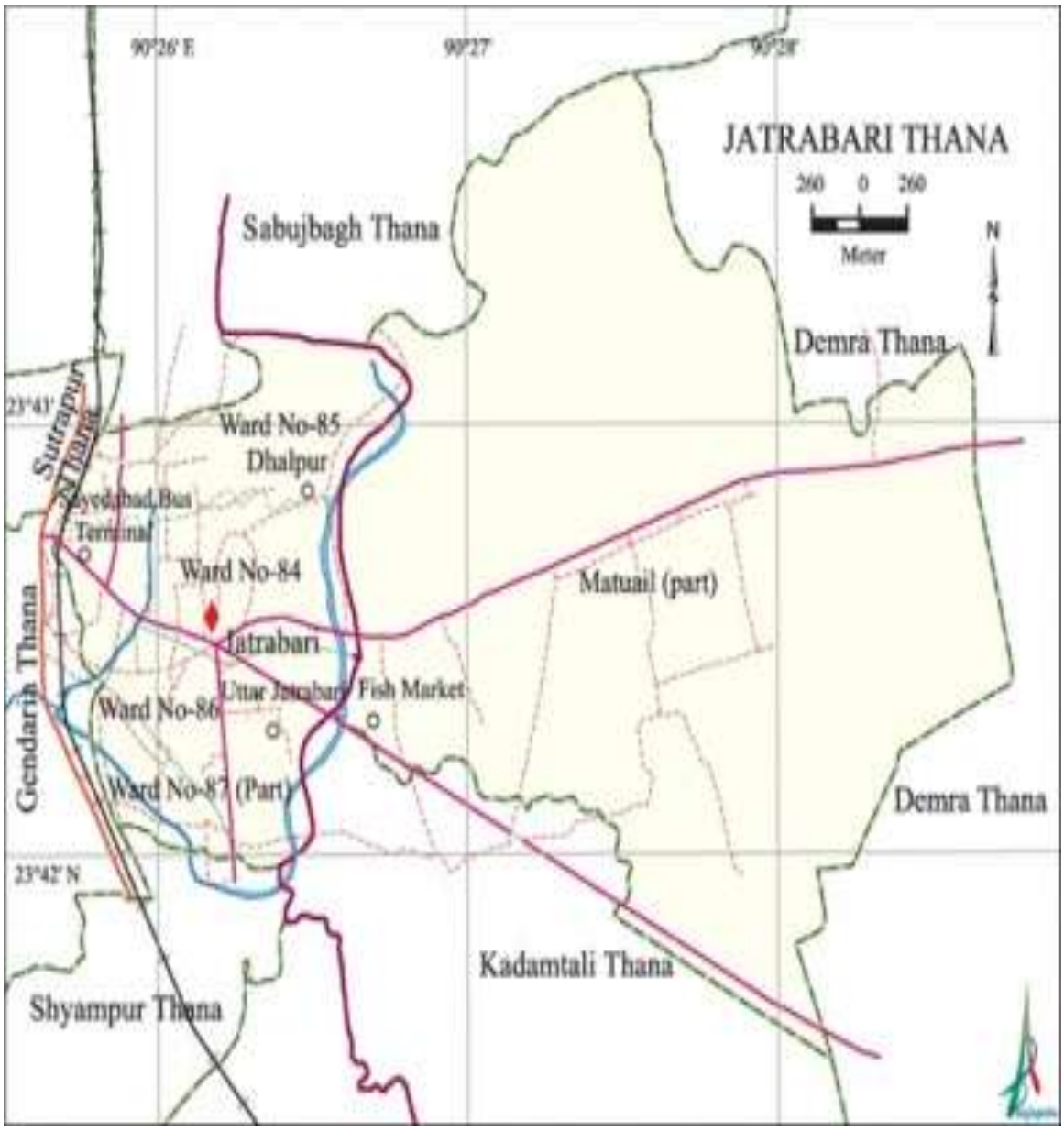

Figure 3. Map of the study area in Jatrabari Thana.

Figure 4. Map of the study area in Mirpur Thana.

3.3 Experimental animal

Male sexed cattle (2-3 years) were the experimental animal.

3.4 Selection of farmers

The 65 respondents were chosen to interview who rear cattle or bought cattle for fattening program. The respondents were interviewed to monitor the socio-economic condition. There are numerous interrelated and ingredient attributes that exemplify an individual and form an essential constituent in the development of one's etiquette and uniqueness. In this study major 4 characteristics of the respondents were chosen to find out the socio-economic condition of the farmers. The selected characteristics included main occupation, level of education, annual income (BDT), sources of money. Respondents those who are used anabolic steroid and feed additives for cattle fattening purpose were haphazardly selected for collecting data to deal with the goals.

3.5 Preparation of the interview schedule

The interview schedule was prepared based on the purposes of the study. It contains both open and closed form questions. The planned interview scheduled was planned to collect information from the respondents on the uses of anabolic steroid and feed additives. A draft agenda was developed before preparing the final schedule. The schedule was developed in a simple way to keep away from misconception and to get accurate result. In the long run it was finalized in relation to the incident gathered in the prelude field analysis.

3.6 Collection of data

Data were collected through the direct interviews and making frequent individual visits. Before initiate the actual interview, the aims of the study were explained clearly to the farmers. Then the questions were asked in a very simple approach with details wherever require. Interviews were usually conducted in the farm or in

respondent house during free time. While starting interview with any respondent, the researcher took all possible care to establish rapport with them. When even, any respondents felt complexity in appreciative any question, the researcher took almost care to make clear and elucidate them appropriately. Admirable assistance and co-ordination was obtained from all respondents, field extension staffs of DLS and different companies' personnel during data collection. Data collection was carried out for 90 days during 3rd May, 2018 to 1st August, 2018. Secondary data were collected at different times from drug pharmacy, upazila livestock officer, veterinary doctor, journals, BBS, various published articles and reports.

3.7 Parameters studied

The interview survey enclosed the major items of information. General information were the beef cattle fattening owners, livestock population, management of fattening cattle, indigenous knowledge on rearing cattle production system and marketing of cattle, feed resources and feeding method, availability, practice of anabolic steroid and feed additives. The use of anabolic steroid and feed additives negative perception and possible suggestions for controlling were also identified.

3.8 Research design

The research plan in the present study will be ex-post as the researcher has no control or could not manipulate the variables as the appeared. Personal surveillance and conversation with the farmers and companies, personal exchange of ideas with extension workers, review of text and opinions of others researchers in home will help the researcher to fulfill the objectives.

3.9 Compilation of data and statistical analysis

The survey on different parameters in this study were illustrative descriptive. Consequently, data were compiled, tabulated and analyzed with simple statistical method to fulfill objectives of the study. The collected data were first transferred to MS-Excel spread sheet and compiled to facilitate the needed tabulation. Analysis was mainly done through tabular and graphical presentation. Tabular method was applied for the analyses of data using simple statistical tool like average and percentage as well as Chi-square (x^2) value, and level of significance through SPSS Statistics 23.0 software for quantitative and qualitative data.

CHAPTER IV

RESULTS AND DISCUSSION

4.1 Socio-economic conditions of the respondents

Number and percentage distribution of respondents according to their main occupation, level of education, annual income (BDT), sources of money and training on cattle fattening are shown in Table 2.

Table 2. Distribution of farmers according to respondent's main occupation, level of education, annual income (BDT), sources of money and training on cattle fattening (n = 65)

Parameters	Categories	No. of farmers	% of farmers
Main Occupation	Agriculture	2	3
	Livestock	11	17
	Others Business	52	80
Level of Education	Can sign only	0	0
	Primary education	2	3
	Secondary education	8	12
	Higher secondary education	13	20
	Others	42	65
Annual Income (BDT)	2, 00, 000- 5, 00, 000	2	3
	5, 00, 000- 8, 00, 000	5	8
	8, 00, 000- 10, 00, 000	10	15
	More than 10, 00, 000	48	74
Sources of money	Own	5	8
	Bank Loan	44	68

	NGO Loan	4	6
	Loan from Mahazan	6	9
	Others	6	9
Training on cattle fattening	Have	4	6
	Have Not	61	94

In this study that out of 65 respondents the majority (80.0%) of the respondents were involved chiefly in others business, followed by 17.0% in livestock business and the rests of the 3.0% were engaged in agriculture. From the table 2 it is indicated that the levels of education of selected respondents were 65.0% others education level, followed by 20.0% completed higher secondary level, 12.0% completed secondary level and 3.0% of them were able to complete their primary level education respectively. Annual income of the respondents were ranked into 4 which was ranged BDT more than 10, 00, 000 were 74.0% and BDT 8, 00, 000- 10, 00, 000 were 15.0% and BDT 5, 00, 000- 8, 00, 000 were 8.0% and the left behind of them which were very insignificant more than BDT 2, 00, 000- 5, 00, 000 were 3.0%. In case of sources of money, 68.0% of the farmers initiate their cattle fattening business by using loan from bank at high interest rate, 8.0% from own sources of money, 6.0% from NGO loan, loan from mahazan 9.0% and 9.0% loan from other sources. Further 65 respondents only 6.0% respondents had cattle fattening training and 94.0% respondents whom had not any guidance on beef cattle fattening course. Information on similar studies is also accessible from different authors. Hashem *et al.* (1999); conducted a survey work on cattle fattening by rural farmers in different districts of Bangladesh and reported that 51.2% having primary education and 28.0% had no education. In addition Rahman *et al.* (2009); conducted an experiment on cattle fattening in Mymensingh district, and reported that about 22.0% farmers were trained and 78.0% were not trained. Ahmed *et al.* (2010); found that 20.5% farmers were trained and 79.5% were not trained. Besides Ali M.A. *et al.* (2011); reported that 56.0% had primary

education, 20.0% had secondary education and 6.0% had higher secondary education and rest of them graduate and post- graduates 16.0% and 2.0% respectively and 52.0% farmers received training and rest of them were not trained.

4.2 Factors related with cattle fattening

Factors linked with cattle fattening according to farm type, number of cattle fattening, breed of cattle, pattern of the program, fattening period, sex of animal, starting and finishing age of cattle fattening, practice of anabolic steroid and feed additives.

Table 3. Factors associated with cattle fattening (n = 65)

Parameters	Categories	No. of farmers	% of farmers
Farm type	Beef type	59	91
	Dairy type	1	1
	Beef + Dairy	5	8
No. of cattle fattening	2-5	4	6
	6-9	6	9
	>10	55	85
Breed of cattle	Indigenous	6	9
	Cross	59	91
Pattern of the program	Just before Eid-ul-Azha	39	60
	Round the year	26	40
Fattening period	3 months or less	3	5
	3 to 6 months	47	72
	6 months to 1 year	15	23
Sex of animal	Castrated male	13	20

	Uncastrated male	52	80
Anabolic steroid	Practiced	52	80
	Non-practiced	13	20
Feed additives	Practiced	61	94
	Non-practiced	4	6

Factors associated with cattle fattening by the Dhaka City respondents are shown in the Table 3. From the table it exposed that 91.0% of farmer's select beef type cattle for fattening purpose and rest of them decide on beef+dairy type farm. Among 65 respondents, 85.0% respondent's farmer had more than 10 cattle for fattening at a time, 9.0% farmer's had 6-9 cattle and more than 2 cattle fattening were done by only 6.0% farmers. About 9.0% farmers select native breed while 91.0% farmer's choice cross breed for fattening purpose. The outline of the cattle fattening from the present study specify that 60.0% fattening practiced only before Eid-ul-Azha and the rest of the 40.0% farmers practiced fattening round the year. Out of 65 respondents 5.0% farmers done fattening 3 months or less and 72.0% farmers done their fattening period 3 to 6 months and maximum number farmers 23.0% farmers fattening period was 6 months to 1 year. Sex is the fundamental point for fattening for this cause 80.0% of them selected uncastrated male and rest of them fattened castrated male. Starting age of cattle fattening also differ farmer to farmer. Among the respondents 80.0% farmers practiced using anabolic steroid as a growth hormone and rest of them did not use any kinds of growth hormone at the period of fattening. Out of total respondents 94.0% farmers practiced feed additives for the purpose of cattle fattening and 6.0% those did not practiced feed additives. The survey indicated that most farmers fattened their cattle for the duration of 3-6 months and round the year, respectively.

4.3 Use of feed additives and anabolic steroids

Table 4 and 5 revealed that the majority of the farmers used anabolic steroid and feed additives as a growth supporter for cattle fattening and they have a preference in powder form. About 37.50% respondents used Acivit- DB, 25.0% Adivit-DB, 8.0% Biomix-DB, 5.0% Ranmix, 6.0%% DB-Vitamin, 7.0% Nutrimix-DB, 8.5% Chemovet-DB, 3.0% Curenal are used in the form of powder as fattening agent.

Table 4. Use of feed additives in Dhaka City (n = 65)

Powder	**% used**	**Injection**	**% used**	**Tablet**	**% used**
Acivit- DB (Vitamin, Mineral premix)	37.5	A-sol (Butaphosphan,Vit B_{12})	23.0	Anora (Iron, Vitamin)	32.0
Adivit-DB (Vitamin, Mineral premix)	25.0	Tocol (Vitamin E,Vit B_{12})	19.5	Roxivet (Vit B_{12}, iron)	21.0
Biomix-DB (Vitamin, Mineral premix)	8.0	Stresol (Vit B_{12})	16.66	Anaron (Iron, Vit B1,Vit B_{12})	13.0
Ranmix (Vitamin, mineral premix)	5.0	Buphos Vet (Butaphosphan,Vit B_{12})	3.34	Biolact Bolus (Enzyme)	15.0
DB-Vitamin (Vitamin A, D)	6.0	Catopen Vet (Butaphosphan,Vit B_{12})	2.5		
Nutrimix-DB (Methionine, Lysine)	7.0	Vitaphos(Toldimphos, Vit B_{12})	5.5		
Chemovet-DB (Vitamin, Minerals)	8.5	Acitol (Vit B_{12})	2.5		
Curenal (FerusSulphate, Vit B_1)	3.0				

About 23.0% respondents prefer A-sol, 19.5% Tocol, 16.66% Stresol, 3.34% Buphos-Vet, 2.5% Catopen, 5.5% Vitaphos, 2.5% Acitol, 7.0% Orasone, 5.0% Dexone, 8.0% Predalone and 7.0% Tredexanol are used as fattening agent in the

Table 5. Use of anabolic steroids in Dhaka City (n = 65)

Injection	%used	Tablet	%used
Orasone(Glucocorticoid steroid)	7.0	Deltasone (Steroids)	19.0
Dexone (Glucocorticoid steroid)	5.0		
Predalone (Synthetic steroid)	8.0		
Tredexanol (Synthetic steroid)	7.0		

form of injection. About 32.0% Anora, 21.0% Roxivet, 13.0% Anaron, 15.0% Biolact Bolus and 19.0% Deltasone are used in the form of tablet as fattening agent. This result differed from the findings of Ali *et al.* (2011); who reported that 8% farmers used Pednivet and 78% used vitamin mineral premix as feed additives.

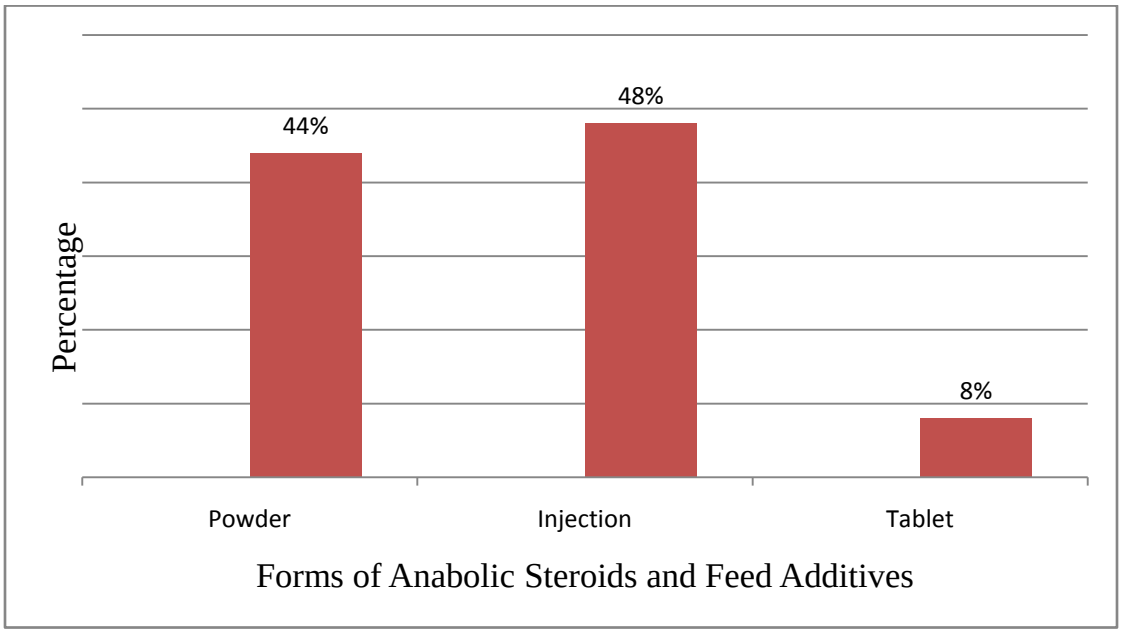

Figure 5. Forms of anabolic steroids and feed additives.

In figure 5 shows that the forms of anabolic steroids and feed additives about 44.0% powder, 48.0% injection and 8.0% tablet forms were used by the respondents as fattening agents.

Table 6. Use of anabolic steroids (n = 65)

Parameter	**Categories**	**Practiced**	**Not-practiced**	**Total**	**% Practiced**	**X2 - value**	**Level of sig.**
Dhaka City	Beribadh, Mohammadpur,	27	3	30	90.0	9.378	P<0.05
	Keraniganj	6	3	9	66.66		
	Jatrabari	9	7	16	56.25		
	Mirpur	5	5	10	50.0		
Main Occupation	Agriculture	1	0	2	50.0	2.281	NS
	Liv. Business	9	3	11	81.81		
	Others	47	5	52	90.38		
Annual Income (BDT	2, 00, 000 – 5, 00, 000	1	1	2	50.0	11.093	P<0.05
	5, 00, 000 – 8, 00, 000	3	2	5	60.0		
	8, 00, 000 – 10,00,000	9	1	10	90.0		
	Above 10, 00, 000	46	2	48	95.83		
Source of money	Own	4	1	5	80.0	12.51	P<0.05
	Bank Loan	43	1	44	97.72		
	NGO Loan	3	1	4	75.0		
	Loan From Mahajan	4	2	6	66.66		
	Others	5	1	6	83.33		
% of income from fattening	<30%	15	2	17	88.23	0.218	NS
	30 to 60%	35	3	38	92.10		
	>60%	9	1	10	90.0		

business							
Farm type	Beef	56	3	59	94.91	1.842	NS
	Dairy	0	1	1	0.00		
	Beef +Dairy	4	1	5	80.0		
No. of cattle fattening	2-5	3	1	4	75.0	6.732	P<0.05
	6-9	5	1	6	83.33		
	>10	54	1	55	98.18		
Breeds of cattle	Indigenous	5	1	6	83.33	4.093	P<0.05
	Cross	58	1	59	98.30		
Pattern of fattening	Eid-ul-Azha	35	4	39	89.74	1.053	NS
	Round the year	21	5	26	80.76		
Fattening Period	3 m or less	2	1	3	66.66	6.360	P<0.05
	3 to 6 m	45	2	47	95.74		
	6 m to 1yrs	14	1	15	93.33		
Form of anabolic steroid	Powder	23	3	28	82.14	1.718	NS
	Injection	24	1	25	96.0		
	Tablet	10	2	12	83.33		
Source of anabolic steroid	Pharmacy	54	5	59	91.52	0.436	NS
	NGO worker	5	1	6	83.33		

NS, Non-significant (P>0.05); P<0.05 and P<0.01

Table 6 revealed that anabolic steroid were practiced 90% in Mohammadpur, Beribadh and has a significant difference from others three areas of Dhaka City. Among the respondents occupation as others was around 90%. The result

demonstrated that respondents of high income used more anabolic steroid. The respondent source of bank loan used about 97.0% of anabolic steroids and has a significant difference from others source of money. About 30 to 60% incoming family used more anabolic steroids of about 92.0% and has a significant difference than others source of income. About 95.0% respondents used anabolic steroid for the period of 3 to 6 months cattle fattening ($p<0.05$).While working with the farmers in rural areas of Bangladesh, Hossain (1986), and Hossain *et al.* (1996), reported cattle fattening periods of 4-5 months and 5-7 months, respectively.

Table 6 revealed the different parameters such as different areas, occupation, annual income, source of money, % of family income from fattening business, farm type, breed type and number of cattle fattened, fattening period etc. are considered which may influence to practice anabolic steroid in cattle fattening business.

Table 7. Use of feed additives (n = 65)

Parameter	**Categories**	**Practiced**	**Not-practiced**	**Total**	**% Practiced**	**X2 - value**	**Level of sig.**
Thana/ Ward/ Area	Beribadh, Mohammadpur	30	0	30	100.0	9.060	P<0.05
	Keraniganj	6	3	9	66.66		
	Jattrabari	13	3	16	81.25		
	Mirpur	8	2	10	80.0		
Main Occupation	Agriculture	1	1	2	50.0	0.667	NS
	Liv. Business	10	1	11	90.90		
	Others	50	2	52	96.15		
Annual Income	2, 00, 000-5, 00,000	1	1	2	50.0		
	5, 00,000- 8, 00,000	4	1	5	80.0		

(BDT)	8, 00,000- 10,00, 000	9	1	10	90.0	1.019	NS
	Above 10,00, 000	46	2	48	95.83		
Source of money	Own	4	1	5	80.0	15.940	P<0.01
	Bank Loan	43	1	44	97.72		
	NGO Loan	3	1	4	75.0		
	Loan From Mahajan	5	1	6	83.33		
	Others	3	3	6	50.0		
% of income from fattening business	<30%	9	1	10	90.0	0.311	NS
	30 to 60%	36	2	38	94.73		
	>60%	15	2	17	88.23		
Farm type	Beef	57	2	59	96.61	0.210	NS
	Dairy	0	1	1	0.0		
	Beef +Dairy	4	1	5	80.0		
No. of cattle fattening	2-5	3	1	4	75	2.293	NS
	6-9	5	1	6	83.33		
	>10	53	2	55	96.36		
Breeds of cattle	Indigenous	5	1	6	83.33	0.210	NS
	Cross	57	2	59	96.61		
Pattern of fattening	Eid-ul-Azha	38	1	39	97.43	0.677	NS
	Round the year	24	2	26	92.30		
Fattening Period	3 m or less	2	1	3	66.66	10.196	NS
	3 to 6 m	45	2	47	95.74		
	6 m to 1yrs	10	5	15	66.66		
Sex of Animal	Castrated Male	12	1	13	92.30	0.349	NS
	Uncastrated Male	50	2	52	96.15		

Table 7 revealed that feed additives was used by all of respondents in Mohammadpur, Beribadh in Dhaka City and has a significant ($p<0.01$) difference from others areas of Dhaka City (Keraniganj, Jattrabari and Mirpur). About 96.0% of the respondent occupations were others. The result demonstrated that respondents of high annual income used more feed additives and in that case 30-60% of incoming family used more feed additives than others source of income. About 97.0% respondents used feed additives whose source of money from bank loan with the significant difference from others source of money. Table 7 revealed the different parameters such as different areas, occupation, annual income, source of money, % of family income from fattening business, farm type, breed type and sex of animal, fattening period etc. are considered which may influence to practice feed additives in cattle fattening business.

Beeson (1959) stated that there is no doubt that feed additives have made a great contribution to improve the performance and general health of livestock. Rick Stock and Mander (1984) stated that one of the best methods to reduce feed costs is through the use of feed additives.

4.4 Different feed additives and sources (n = 65)

Based on the sources of feed additives, the figure 6 shows that about 45.0% respondents used vitamin mineral premix, 22.0% enzyme, 10.0% antibiotics and 23.0% anabolic steroids for cattle fattening. The sources of feed additives differs farmers to farmers. In figure 7 shows that most 45.0% of the farmers knew about the use of feed additives from neighbor farmers, 31.0% from livestock officer, 5.0% from NGO workers and the rest 19.0% from veterinary representative. This result differed from the report of Ali *et al.* (2011); who found that 90% farmers used feed additives, 8% used vitamin-minerals premix and only 4% used anabolic steroids.

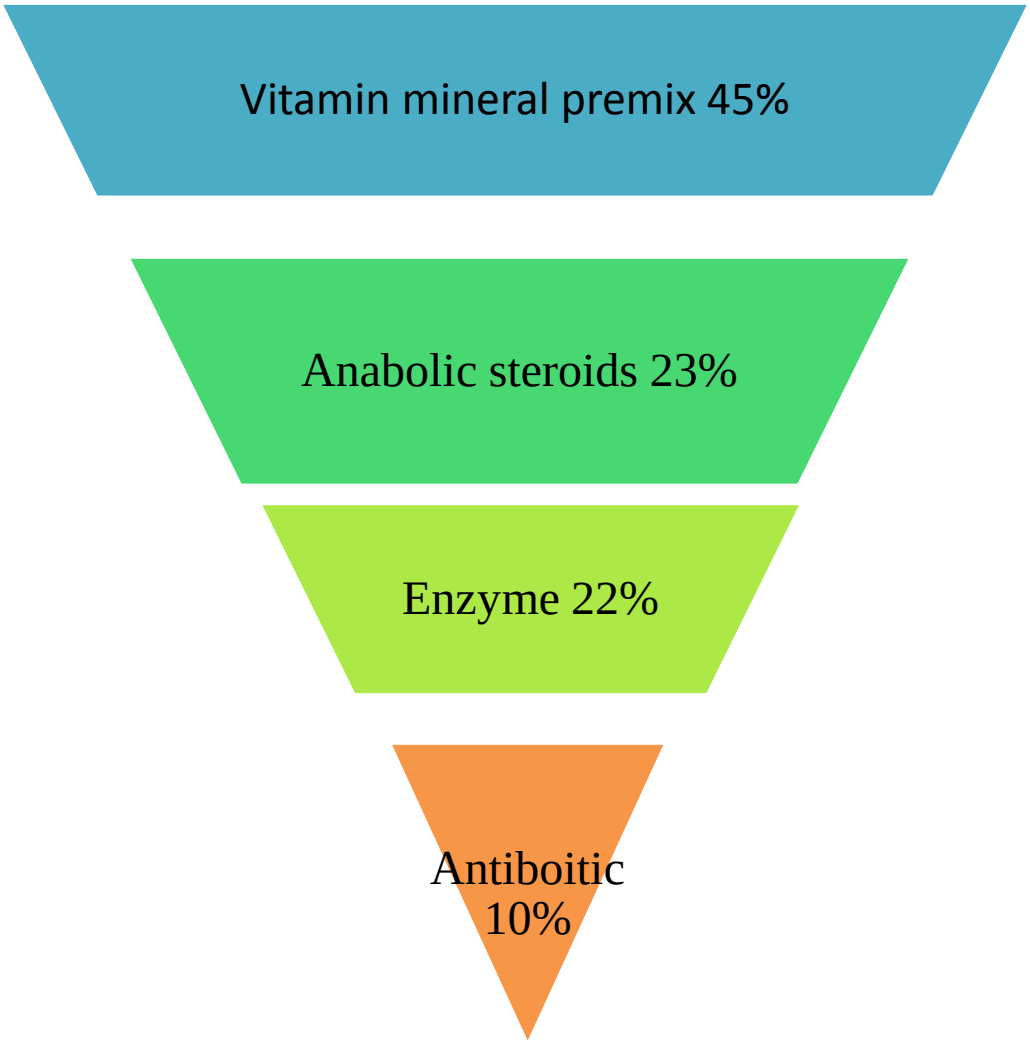

Figure 6. Different feed additives.

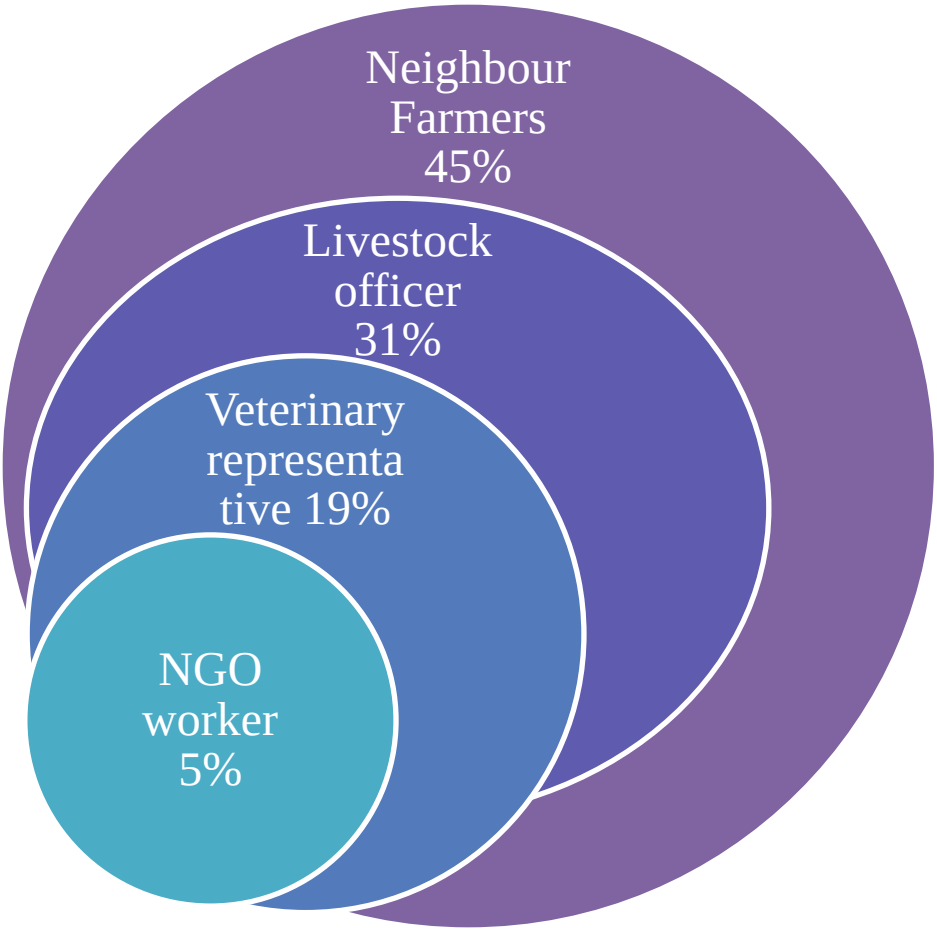

Figure 7. Source of different feed additives.

4.5 Problems and suggestions to improve cattle fattening

Table 8 shows that the most important problem faced by the respondents (55.0%) was the high price of concentrate feed. followed by lack of knowledge (17.0%) for the selection of appropriate breed, capital problem (13.0%), disease problem (6.0%) and lack of knowledge about feed additives and anabolic steroids (9.0%). The report show that lack of training, credit facilities, feed price hiking, disorganized marketing system were also problems related to cattle fattening in Bangladesh.

Table 8. Problems related to cattle fattening (n = 65)

Problems related to cattle fattening	**No. of farmers**	**% of farmers**
High price of concentrated feed	36	55
Lack of knowledge about the selection of appropriate breed	11	17
Capital problem	8	13
Disease(s) problem	4	6
Lack of knowledge about feed additives and anabolic steroids	6	9

Table 9. Suggestions to improve cattle fattening program (n= 65)

Suggestions related to cattle fattening	**No. of farmers**	**% of farmers**
Selection of animal on the basis of breed, color, age, skin, sex and eye	7	11
Good feeding and management	28	43
Deworming for regular basis	5	7
Reduced cost of concentrates feed	20	31
Availability of training facilities on cattle fattening	5	8

Table 9 also shows that 43.0% respondents suggested that good feeding and management is the first key to cattle fattening, followed selection of breed (11.0%), deworming (7.0%), reduction of concentrate feed cost (31.0%) and availability of training facilities for cattle fattening (8.0%). The result of this study differed from Rahman *et al.* (2001); reported 65% suggested supplying the adequate feed at subsidized price, 20% suggested selecting appropriate breed for fattening.

CHAPTER V

SUMMARY AND CONCLUSION

The study was conducted to formulate a record on using anabolic steroids and feed additives in cattle fattening in the country. To attain the objectives of the study, a purposive appraisal was carried out among the farmers in Dhaka city of Bangladesh, who were concerned in cattle fattening activities before Eid-ul-Azha (2018). A total of 65cattle fattening farmers were chosen for interview from the 3 areas of Dhaka city that were eager to make available information about cattle fattening practices. The data were collected from each farmer through direct interviewing technique and scrutiny of facts from their family circle. In addition to above, a total of 8 pharmaceutical companies, who imported and manufactured growth promoters (antibiotics, steroids, vitamin minerals premixes, probiotics and mineral premix) and sold huge amount of their products, were chosen on the basis of the information from Department of Livestock Services (DLS) to know the obtainable market situation in the country. All data were collected through interview schedule. The interview schedule for farmers for contained the major items of information such as farmer's information, feed sources and availability and type and cost of growth promoters used and the interview schedule for pharmaceutical companies contained the major items of information, such as company identification, product information and specification and market volume of product. The researcher conducted farm to farm survey efficiently. All possible efforts were made to explain the purpose of the study to the respondents in order to get valid and patient information. Significant association was observed on the use of anabolic steroids with different areas of Dhaka city, annual income, source of money, number of cattle fattening, breeds of cattle, fattening period. The X^2 value of annual income was 11.09 indicating that with increase of annual income was associated was increased of anabolic steroids and >10 numbers of cattle are

highly fattened by using growth promoters ($p<0.05$). Most of the respondents used bank loan for using anabolic steroids and feed additives ($p<0.05$).

Anabolic steroids and feed additives used as a growth promotant for the increased feed efficiency, growth rate, carcass quality and maximum economic benefit in cattle fattening in Dhaka city. To develop a sustainable beef cattle production system in Bangladesh which starts at the farmer's level for production and ending at consumer's level for consumption. So it is necessary to find out the existing beef cattle production system, marketing, processing systems and consumers perception. There is a great opportunity to develop suitable small scale cattle fattening both for satisfying animal protein requirement and production of quality beef. For further study investment on meat processing and beef cattle production sectors should be encouraged.

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APPENDIX I

Pictures of fattened cattle in Dhaka city (Mohammadpur, Keraniganj, Jatrabari and Mirpur areas) before Eid-ul-Azha.

Figure: Fattened cattle in Mirpur areas of Dhaka city.






Figure: Fattened cattle in Mohammadpur areas Dhaka city.

Figure: Fattened cattle in Jatrabari areas of Dhaka city.






Figure: Fattened cattle in Keraniganj areas of Dhaka city.

APPENDIX II

English Version of the Interview Schedule

Department of Animal Production and Management

Sher-e-Bangla Agricultural University, Dhaka-1207

Interview schedule for data collection for the research on

"PRESENT SCENARIO OF USING ANABOLIC STEROIDS AND FEED ADDITIVES DURING CATTLE FATTENING IN DHAKA CITY"

Serial No.:

Name of the respondent: **Age:**

Sex: **Occupation:**

Area:

1. **What is your education level?**

Can sign only	
Primary education	
Secondary education	
Higher secondary education	
Others	

2. **Annual income:**

2,00,000-5,00,000 lacs	
5,00,001-8,00,000 lacs	
8,00,001-10,00,000 lacs	
More than 10,00,000 lacs	

3. **Farm type:**

Beef type	
Dairy type	
Both type	

4. **Breeds of cattle:**

Indigenous breed	
Exotic breed	
Both type	

5. **Number of cattle use for fattening:**

2- 5	
5- 10	
Above 10	

6. **Source of money for cattle fattening:**

Own	
Bank loan	
Loan from mahazan	
NGO loan	
Others	

7. **Pattern of the program:**

Just before Eid-ul-Azha	
Round the year	
Seasonal	

8. Fattening periods:

≤3 months	
3-6 months	
6 months to 1 year	

9. Sex of animal

Castrated male	
Uncastrated male	

10. Training on cattle fattening

Have	
Have not	

11. Do you use anabolic steroids?

If yes, please mention the following:

Name of the anabolic steroids	
Type/ Form	
Route of administration	

12. How did you informed about anabolic steroids?

Neighbors	
Livestock officer	
Veterinary representative	
NGO worker	

13. Does anabolic steroid have impact on growth?

If yes, what's the growth rate per week:

14. When will you stop the use of anabolic steroids?

One month before marketing	
One week before marketing	
One day before slaughtering	

15. Do you have any knowledge about health hazards of excess use of anabolic steroids?

Yes	
No	

16. Do you have any knowledge about environmental hazards of excess use of anabolic steroids?

Yes	
No	

17. Do you agree to know about the consumers who are consuming anabolic steroids products?

Yes	
No	

18. Do you use any feed additives?

If yes, please mention the following:

Name of the feed additives	**Use**	**Type/ Form**	**Route of administration**
Antibiotic			
Steroids			
Enzyme			
Hormones			

Vitamin premix			

19. How did you informed about feed additives?

Neighbours and middle man	
Livestock officer	
Veterinary representative	
NGO worker	

20. Does a feed additive have impact on growth?

If yes, what's the growth rate per week:

21. When will you stop the use of feed additives?

One month before marketing	
One week before marketing	
One day before slaughtering	

22. Do you have any knowledge about health hazards of excess use of feed additives?

Yes	
No	

23. Do you have any knowledge about environmental hazards of excess use of feed additives?

Yes	
No	

24. **Any extension worker or marketing officers visited your farm.**

    If yes, who:

25. **Problem regarding about cattle fattening:**

    a.

    b.

    c.

26. **Do you get any financial benefit by using feed additives and anabolic steroids:**

Yes	
No	

27. **Suggestion to improve cattle fattening program:**

    a.

    b.

    c.