Chapter –I

INTRODUCTION

Beef fattening is the intensified feeding of cattle to obtain the greatest quantity of high quality meat **(shmakov *et al.*, 1969)**. It can increase the income of the farmer. It can also compensate the deficiency of protein of the cattle which promote weight gain. In cattle raising several types of fattening are used to obtain dietetic veal, regular veal, baby beef, and beef **(shmakov *et al.*, 1969).** Like other agro-based developing countries Bangladesh also has to depend mainly on agriculture. About 80% people dependent on agriculture. Livestock play a great role in this agriculture dependent country **(FAO, 1998).** The livestock sector contributes 3 percent to the Gross Domestic Product (GDP) **(BBS, 1989).** Feeds and strategy of feeding are the important factors for livestock development. The feeding practice of livestock of Bangladesh is very much traditional and conventional **(Tareque, 1991).**

The cattle population Bangladesh very commonly suffers in malnutrition as well as beef fattening we need energetic diet. Cattle need minimum of 16% CP (crude protein) in their ration for their optimum growth, production, and reproduction (NRC, 1990). But through the conventional feeds and feeding systems they get a very lower amount of CP (Khalek *et al.,* 2004). The true protein (TP) feeds are very much expensive and so farmers can't offer their livestock the high protein source feeds. On the other hand urea is a NPN (non-protein nitrogen) substance which provides 16% CP to the ruminant animals. So incorporation of urea into the ruminant diet along with a higher carbohydrate (CHO) source can provide adequate protein as well as energy requirement of the ruminants which subsequently positively affect the growth, production, and reproduction of the ruminants **(Mathur and Sharma, 1985)** such type of material can be used as beef fattening.

Green grass from arable and non-arable land and some concentrates are also available at a sub-normal amount. Due to inadequate production of green grasses, rice straw has become the major feed resource for the livestock production of Bangladesh (Molla *et*

al., 2009). To overcome this shortage of feed and to provide adequate nutrition to the existing animals the conventional rice straw can be fed to the animal by somewhat modern feeding system. Modifying or treating this rice straw by other feed supplements like is an effective program for local cattle development. One of these processes is urea treatment of the straw. It is very much effective in cattle growth and also fattening. Cattle fattening for beef production has become an important business of the small farmers in Bangladesh (DLS, 2000). The Department of Livestock Services (DLS) has taken beef fattening as an action program to generate income for the rural poor farmers. There is little information available on cattle fattening by the rural farmers (Hossain, 1986). However worked on management system of cattle regarding feeding, housing, disease prevention and marketing in the Comilla district. (Hossain *et al.,* 1996) conducted a study on beef fattening in the Manikganj district. They all trialed on beef fattening by urea feeding.

Stress causes cortisol to be released into the bloodstream, which can impair the immune response, cause loss of appetite, increase susceptibility to disease and reduce growth rate. Butaphosphan can be an important adjunct in hastening recovery and minimizing the effects of nutrient deficiencies related to poor feed intake.

As indicated earlier the information related to cattle fattening in Bangladesh is very sporadic. Detailed study is needed covering different districts of Bangladesh to recommend cattle fattening programs for the rural poor farmers as an income generating activity. Therefore, the present study was undertaken to investigate the following objectives of beef fattening at kalaroa upazilla.

OBJECTIVES:

- To know the effect of feed and metabolic drugs on beef fattening.
- To evaluate the cost effective methods of beef fattening.
- To fulfil the demand of protein.
- To create employment opportunity.
- To earn more profit.

CHAPTER-II

MATERIALS AND METHODS

2.1. Placement + Duration of the study

The placement of study was carried out in daluipur village at Kalaroa upazila of Satkhira district for a period of 8 weeks from February to March, 2018.

2.2. Selection of animal for beef fattening

Nine healthy indigenous young calves of almost 1.5 to 2.5 years of age (average body weight of 64 kg) were selected from the backyard system inhibiting under Daluipur village at Kalaroa Upazilla, under Satkhira district of Bangladesh. The character of selected animal are presented in table-1

Table-1: Age, Body weight and Id. number of group of animal

Group of animal	Id number	Age(years)	Body weight(kg)
A	A_1	1.9	61.2
	A_2	1.8	54
	A_3	1.8	57
B	B_1	1.5	58
	B_2	2.2	69
	B_3	1.8	63
C	C_1	2.6	74
	C_2	2	64
	C_3	1.9	68

2.3 **Anthelmintics:** Prior to fattening in each animal with Endex (novertis)1bolas@41-70kg body wt. sufficient amount of water was supplied during this period for better metabolism of drugs.

2.4: Experimental design and different treatment

In the present study following three types of diets and injection are offered to three different groups.

Group	**Feed items**
G-A	Urea+ rice straw+ green grass + concentrate mixture
G-B	Urea molasses straw with kitchen by products+green grass + rice polish with metabolic injection
G-C	Rice straw +green grass+concentrate mixture + metabolic injection

Animals of group-A were supplied urea, rice straw, green grass, concentrate mixture. Animals of group-B were supplied with urea molasses straw with kitchen by product, green grass, 250 gm rice polish with metabolic injection. Animals of group-C were supplied with rice straw, green grass, concentrate mixture and metabolic drug

The ingredients composition and nutritive value of the experimental diet-B are shown in the table-2

Table 2: Ingredient composition and nutritive values of the experimental diets and injection

Particulars	**Dietary group A (gm/ day)**	**Dietary group B (gm/day)**	**Dietary group C (gm/ day)**
Rice straw	3550 gm	2000 gm	3550 gm
Green grass	Adlibitum	Adlibitum	Adlibitum
Kitchen waste	0 gm	1000 gm	0 gm
Rice polish	0 gm	250gm	0 gm
Urea	20gm	20gm	0 gm
Molasses	0 gm	300gm	0 gm
Salt	3 gm	3 gm	3 gm
Catophos (inj.)	0 gm	.57 gm	.57 gm
Total	3573gm	3573gm	3553gm
Nutritive value (calculated)			
DM%	71.7%	71.7%	69%
CP%	7%	7%	4.6%
DCP%	2.3%	2.3%	2.3%
TDN%	45.5%	45.5%	45.5%

2.5: Methods of feeding

Firstly, all the ingredients were measured using manual balance and then the 20 gm urea was mixed with 4 liter of water and finally the molasses mixed homogenously. Then the urea-molasses solution was sprinkled over the rice straw. During sprinkling the rice straw was stirred for several times. The prepared treated straw stored with polythene and fed to the animals to a special bamboo made feeder. The prepared treated straw was fed to the animals at first week @ 1 kg treated straw + 1 kg untreated straw and then the following weeks @ 2 kg treated straw to each animal. The rice polish and salt measured everyday and fed to each animals by mixing with water twice a day (at morning and afternoon). The residue of treated rice straw of previous day was mixed

with the treated rice straw of the next day. Green grass offered adlibitum. .Urea treated straw supplied to the group A and group B.

In case of diet-C , the rice straw was offered untreated and concentrated mixture was offered excluding urea. Everyday 3.5 kg rice straw was measured and offered to each animal. The residue of the rice straw of the previous day was offered by mixing with the next day diet. Green grass offered adlibitum. The 3 gm salt with straw which offered twice daily at morning and at afternoon. Catophos (ing.) is given intramuscularly. The chemical composition of the supplied ingredients is given in the following table.

Table-3: Chemical composition of the ingredients supplied

Ingredients	DM %	CP %	DCP%	TDN%
Rice straw	88	2.4	0	41.62
Green grass	30	9.36	5.13	58.43
Rice polish	91.8	12.2	6.76	64.4
Urea				
Molasses	73.6	3		

Source: (Banerjee, 1998)

2.6: Body weight measurement

At the beginning of the experiment the animals were weighted at morning before offering any types of feed by using Shaeffer's formula and the measurement was continued throughout the experiment at morning once weekly.

Fig. 1: Measuring length between point of shoulder to pinbone

Fig. 2: Measuring Heart Girth of animal

Body weight = $(L\times G^2)/300$ = Weight (lb)

Here,

L= Length of the body starting from point of the shoulder to the point of buttock in inch.

G=Heart girth in inch

By dividing with 2.2 to get the reading in kg. (G.C. Banerjee, 1998).

2.7 Statistical analysis

The obtained information was imported, stored and coded accordingly using Microsoft Excell-2007 to STATA/IC-11.0 (Stata corporation college station) for analysis. The results were expressed in body weight gain with P-value for Chi-square test. Significances was determined when $P<0.05$.

CHAPTER-III
RESULTS AND DISCUSSION

3.1: Dry matter intake

Dry matter intakes of the experimental animals are shown in **Figure-3.** It can be seen from the tables that total dry matter intake in dietary group-A and dietary group-B animals were similar and slightly higher than that of the dietary group-C animals. However the difference, is not significant ($p>0.05$). The DM intake of the experimental animals group A and B are similar and it may due to affinity of the animals towards the urea-molasses treated straw and urea-molasses supplemented concentrations. As the experimental diet-C has no such type of urea-molasses treated straw or urea-molasses supplemented concentrate the DM intake also significantly lower than the experimental diets A and B.

Green grass intake was also similar in the animals of each group. Since the animals were given fixed quantity of rice straw the response on straw intake was not noticed. Rice straw was deficient in nitrogen, energy, and minerals and cannot support maintenance or production unless supplemented with deficient nutrients required for microbial growth in the rumen as well as by the animal (Preston and Leng, 1984).

(Campling *et al*., 1962) have reported that when urea infused continuously in the rumen of cattle (150gm/day), straw consumption. It appears that such supplementation speed up the rate of fermentation of straw due to increased microbial activity in the rumen through microbial proliferation but this did not alter the extent of fermentation on terms of unit amount of ingested straw.

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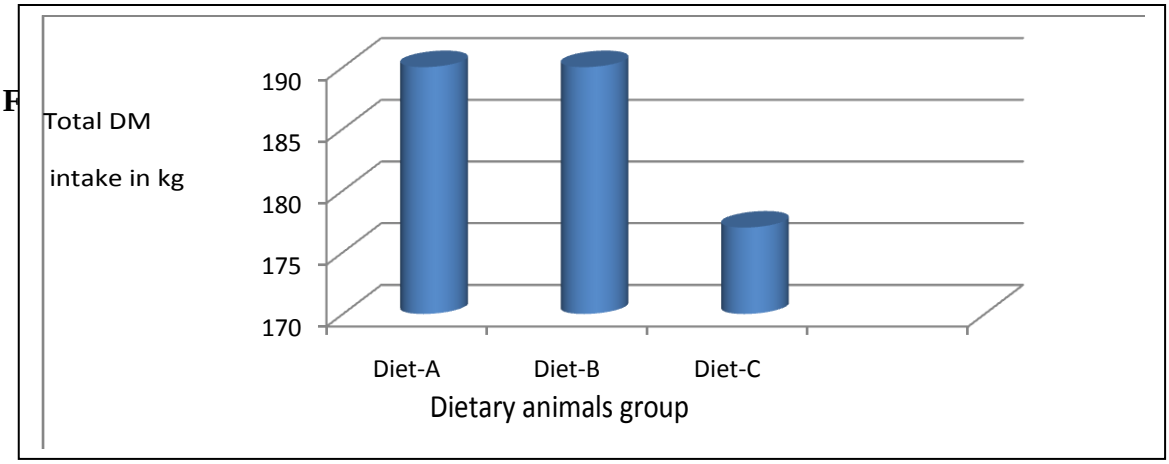

The effect on live weight gain and feed efficiency of different experimental diets are shown in Table 4

Table 4: Effect on live weight gain and feed efficiency of different experimental diets

Particulars	Animal Group			Level of significance
	Dietary animals group A	Dietary animals group B	Dietary animals group C	
Initial body wt.(kg)	57.6 ± 7.68	63.5 ± 7.68	69 ± 7.68	NS
Final body wt(kg)	58.55 ± 7.8	64.6 ± 7.8	67.65 ± 7.8	NS
DM intake(kg)	191 ± 9.00	191 ± 9.00	178 ± 9.00	NS
Gain in body wt(kg)	2.6 ± 0.13	4.15 ± 0.13	3.05 ± 0.13	*
Feed convertion efficiency(kg feed/live wt gain)	102.9 ± 1.44	64.15 ± 1.44	87.65 ± 1.44	*

3.2: Weight gain

I have measured the body weight of animals by Shaeffer's formula. From the table-4, it is seen that the body weight gain of the experimental group-B is the highest among the experimental groups. This indicates that treatment of straw with urea and butaphosphan has positive effect on the live weight gain of the animals. Statistical analysis showed that gains in animals receiving diet-A and C were significantly lower than those receiving diet-B. The reason for lower live weight gain in group-A and C animals is might be due to the type of the experimental diets (without urea in diet-C and without butaphosphan(ing) by urea in diet-A) which has been reported by (Sadullah and Haque,

1981) and might due to higher digestible energy intake by group-B animals, (Jayasuriya, 1981.)

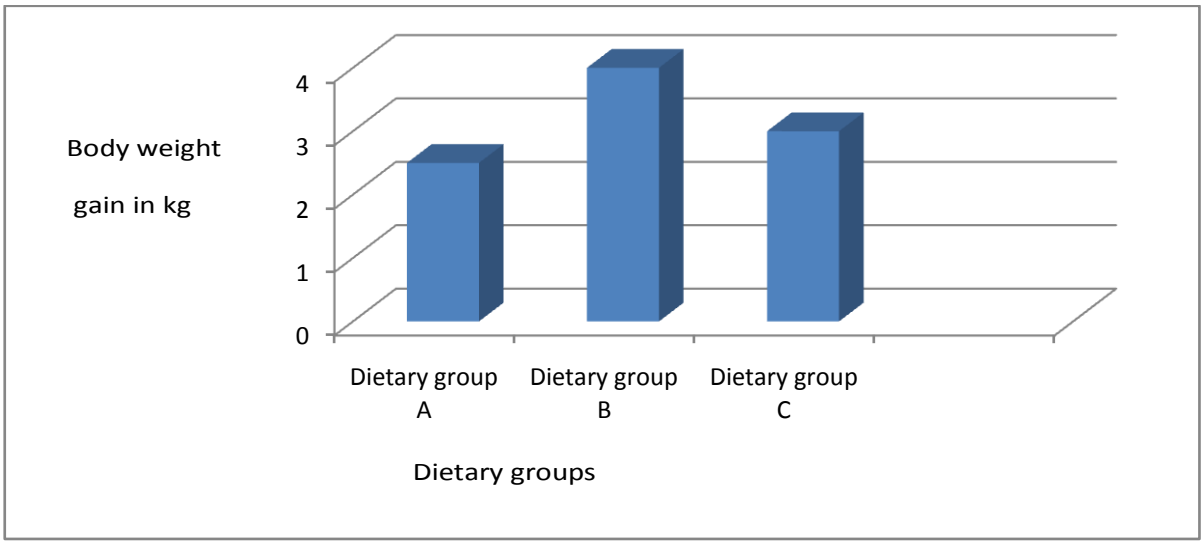

Fig. 4: Comparison of body weight gain (kg) of the different experimental animals.

3.3: FCR analysis

The FCR of the experimental animals group was determined by dividing the kg body weight gained to the kg feed intake and it was found that the FCR is significantly lower in experimental animal's group-B than the group-A and C. So it can say that urea-molasses treated straw is more suitable, preferable and economic than the urea-molasses supplementation or the untreated rice straw diets which is also reported by (Khandaker and Reza., 1993).

3.4: Observation of the animal

Table 5: Comparison of body weight gain in different animals.

Animal ID NO	Initial Body weight	Animals body weight (Kg)							
		1st week	2nd week	3rd week	4th week	5th week	6th week	7th week	8th week
A1	61.2	61	61.2	61.2	61.4	61.6	61.5	61.5	61.8
A2	54	54	54.1	54.2	54.4	54.5	54.5	54.6	54.9
A3	57	57	57.1	57.2	57.4	57.5	57.5	57.6	57.9
B1	58	58	58.2	58.5	58.8	58.8	58.9	59	60
B2	69	68	68.3	68.4	68.5	68.4	68.5	68.7	69
B3	63	63	63.3	63.4	63.5	63.4	63.5	63.7	64
C1	74	74	74	73	73.2	73.1	73.1	73	73
C2	64	63	63	62	62.1	62	62	62.1	62
C3	68	67	67	66	66.1	66	66	66.1	66

DISCUSSION

Feeding of urea treated rice straw with catophos (inj.) intramuscularly to the cattle shows better utilization of roughages as well as rapid live weight gain rather than urea supplemented or urea untreated rice straw diet. As ours is a poor country and we cannot offer good quality roughage to our cattle most of them are malnourished and emaciated. Again the rice straw is harder than other dry roughages and requires more energy to digest it. So in comparison to other forages rice straw shows minimum growth of animals. The experiment proved that treatment of rice straw with urea-molasses increase the protein, energy as well as palatability and tenderness of rice straw which subsequently increase the intake as well as growth of the animals. Butaphosphan and cyanocobalamine (Catophos-inj.) can be an important adjunct in hastening recovery and minimizing the effects of nutrient deficiencies related to poor feed intake. The other method having urea supplementation with concentrate mixture not shows a marked positive effect on the feed intake as well as the growth of the animals. So in the poor countries like Bangladesh the farmers both at backyard and farm level can fed the urea treated rice straw and can inject metabolic injection to the cattle. As it requires least cost, labor and time but gives better result it is applicable throughout the country.

CHAPTER-IV

Limitation of the study

There were some limitations in my study. The study period was limited and study area was restricted to a particular district. The sample size was small. Treatment variation was limited.

CHAPTER-V

CONCLUSION

The farmers of our country yet unaware of it and who know about it they also afraid of applying this feeding method (due to sometimes change of urea toxicity).If the feeding method can be followed scientifically it will improve the health of the animals as well as the farmers condition. The farmers of our country should feed their animals urea treated straw with butaphosphan intramuscularly instead of untreated rice straw.

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