**Comparison of different beef fattening practices in Ranisankail Upazilla,**

 **Thakurgaon District.**



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**Comparison of different beef fattening practices in Ranisankail Upazilla,**

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 **List of abbreviations**

|  |  |
| --- | --- |
| **Abbreviation** | **Elaboration** |
| CP | Crude protein |
| CVASU | Chattogram Veterinary and Animal Sciences University |
| DCP | Dicalcium Phosphate |
| DM | Dry matter |
| DVM | Doctor of veterinary medicine |
| *P* | Probability |
| TDN | Total Digestible Nutrient |
| Wt | Weight |

 **Abstract**

This study was undertaken to examine the effect of different beef fattening program practiced by cattle farmer in Ranisankail Upazilla under Thakurgaon district from October 2019 to November 2019. 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 area and distributed into three experimental diet group (Group A, B and C) with 3 animals per group. Animals of group-A were supplied urea, rice straw, green grass, concentrate mixture. Animals of group-B were offered 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. Anthelmintic were supplied during this period for better metabolism of drugs. Feeding urea treated rice straw to the cattle showed better utilization of roughages as well as rapid live weight gain. The experiment proved that treatment of rice straw with urea-molasses can 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. Toldimfos sodium and cyanocobalamine can be an important adjunct in hastening recovery and minimizing the effects of nutrient deficiencies related to poor feed intake.

**Key words:** Beef fattening, Anthelmintics, Cyanocobalamine.

 **Chapter 1: Introduction**

Beef fattening is an intensified feeding program 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, thereby increases the income generation of farmers. Farmers generally use several types of beef fattening program in order to obtain dietetic veal, regular veal, baby beef, and beef (Shmakov et al., 1969). Like other agro-based developing countries, the economy of Bangladesh mainly depends on agriculture. About 80% people is reliant on agriculture for their daily livelihood. 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 feeding strategies are the important factors for livestock development. The feeding practice of livestock of Bangladesh is very much traditional and conventional (Tareque, 1991).

Beef fattening is an intensified feeding program of cattle to obtain the great quantity of high-quality meat**.** Animal selection is the first thing to do. Breed, age, characteristics of animal and the source of animals are very important for beef fattening Habitat and feeding are the main focus. 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 of Sahapara, Ranisankail upazilla under Thakurgaon district of Bangladesh. 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 (Mathur and Sharma,1985).

The cattle population of Bangladesh very commonly suffers in malnutrition. Cattle need minimum of 16% CP (crude protein) in their ration for their optimum growth, production, and reproduction (NRC, 1984). 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).

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 urea 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).

As Thakurgaon is a fertile agriculture-based area where abundant amount of green grass is produced. Farmers of this area can easily use this green grass with other concentrate to enhance growth of cattle. This study suggested them to use sufficient concentrate in feed.

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. Cyanocobalamine 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 program at Ranisankail Upazilla under Thakurgaon district.

**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 2: Materials and Methods**

**2.1. Placement + Duration of the study**

The study was carried out in Ranisankail Upazilla of Thakurgaon district for a period of 8 weeks from October 2019 to November 2019.

**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 of Sahapara,Ranisankail upazilla under Thakurgaon district of Bangladesh. The characters of selected animals are presented in Table-1

**Table-1: Age, Body weight and identification number of groups of animals**

|  |  |  |  |
| --- | --- | --- | --- |
| **Group of animals** | **Id. Number** | **Age(years)** | **Body weight(kg)** |
|  **A** | **A1** | 1.9 | 61.2 |
| **A2** | 1.8 | 54 |
| **A3** | 1.8 | 57 |
|  **B** | **B1** | 1.5 | 58 |
| **B2** | 2.2 | 69 |
| **B3** | 1.8 | 63 |
|  **C** | **C1** | 2.6 | 74 |
| **C2** | 2 | 64 |
| **C3** | 1.9 | 68 |

**2.3 Anthelmintics:** Prior to fattening, each animal was offered Endex (novertis)1bolas@41-70kg of body weight. 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 were 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 different experimental groups 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  | 2000 | 3550 |
| Green grass | Adlibitum | Adlibitum | Adlibitum |
| Kitchen waste | 0 | 1000 | 0 |
| Rice polish | 0 | 250 | 0 |
| Urea | 20 | 20 | 0 |
| Molasses | 0 | 300 | 0 |
| Salt | 3 | 3 | 3 |
| Metagen(Inj.) | 0 | 0.57 | 0.57 |
| Total | 3573 | 3573 | 3553 |
| 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 was 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 were measured every day and fed to each animal 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 was 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. Straw with 3 gm salt was offered twice daily at morning and afternoon. Metagen(inj.) was 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 | 99.4 | 286 | 0 |  |
| 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.

Body weight = (L× G2)/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. (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 one-way ANOVA test. Significances was determined when P<0.05.

 **Chapter 3: Results and Discussion**

**3.1: Dry matter intake**

Dry matter intakes of the experimental animals are shown in **Figure-3**. 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 be 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). It appears that such supplementation speeds 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.

Dietary Animal Group

Total DM intake in kg

**Figure 3:** Total DM intake of experimental animals.

Here, Blue = Group A; Yellow= Group B; Green= Group C

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

|  |  |  |
| --- | --- | --- |
| Variables |  Animal Group | Level of significance |
| Group-A | Group-B | Group -C |
| Initial body weight (kg) | 57.6 ± 7.68 | 63.5 ± 7.68 | 69 ± 7.68 | NS |
| Final body weight (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 |
| BWG (kg) | 2.6± 1.3 | 4.15±0.13 | 3.05± 0.13 | **\*** |
| FCR | 102.9±1.44 | 64.15±1.44 | 87.65±1.44 | **\*** |

NS= Not significant; \* P< 0.05

BWG=Body weight gain

FCR=Feed conversion efficiency (kg feed/ live wt. gain)

**3.2: Weight gain**

The effect of different experimental diets on live weight gain and feed efficiency are shown in **Table 4**. The body weight of animals was measured by Shaeffer’s formula. The body weight gain of the experimental group-B is the with urea and cyanocobalamine has positive effect on the live weight gain of the animals (Table 4). Weight 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 cyanocobalamine(inj) by urea in diet-A) which has been reported by (Sadullah et al., 1981) and might due to higher digestible energy intake by group-B animals, (Jayasuriya, 1981.)

**3.3: FCR analysis**

Dietary Group

The FCR is significantly lower in experimental animal’s group-B than the group-A and C. So, it can be said 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 previous study (Khandaker and Reza., 1993).

**3.3: Observation of the animal**

**Table 5: Comparison of body weight gain in different animal**

|  |  |  |
| --- | --- | --- |
| **Animal ID No.** | **Initial Body Wt.** | **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 | 63.1 | 73 | 73 |
| **C2** | 64 | 63 | 63 | 62 | 62.1 | 62 | 62 | 62.1 | 62 |
| **C3** | 68 | 67 | 67 | 66 | 66.1 | 66 | 66 | 63.1 | 66 |

Here, we can see the body weight of animals of group A in 8th week is increased by 0.6 to 0.9 kg. In group B weight increasred by 1to 2kg. But in Group C it decreased.

 **Chapter 4: Conclusion**

Feeding of urea treated rice straw with Metagen (inj.) intramuscularly to the cattle showed better utilization of roughages as well as rapid live weight gain rather than urea supplemented or urea untreated rice straw diet. Being a poor country, we cannot offer good quality roughage to our cattle, therefore, 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 showed minimum growth of animals. The experiment proved that treatment of rice straw with urea-molasses increased the protein, energy as well as palatability and tenderness of rice straw which subsequently increase the intake as well as growth of the animals. Toldimfos and cyanocobalamine (Metagen-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. Besides, this method is time and cost effective and does not need many labors to execute. Therefore, farmers of developing countries like Bangladesh, can feed the urea treated rice straw with intramuscular metabolic injection to the cattle in order to maximize the economic benefit.

 **Problems and Recommendations**

**Problems:**

1. High cost of concentrate feed.

 2. Lack of knowledge among the farmers.

3. Lack of modern farming facility.

4. The period of research duration (2 months) is not enough to get all necessary information.

5. Low price of cattle due to illegal Indian cattle introduced in the market.

**Recommendations:**

1. Government can give subsidy to the farmers who are interested in those types of beef fattening process.

2. Laws should be strict.

3. Feed price should be reduced.

4. Field veterinary service must be easier to the farmers.

 **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.

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Finally, I express thanks and warmest sense of gratitude to my parents and all well-wishers.

 **Biography**

I am Azizunnaher Akhy, daughter of Md. Ayes Uddin and Rashida Begum. I passed Secondary School Certificate Examination in 2011 (G.P.A-5) followed by Higher Secondary Certificate Examination in 2013 (G.P.A-5). Now I am an intern veterinarian under the Faculty of Veterinary Medicine in Chittagong Veterinary and Animal Sciences University, Bangladesh. In the future, I would like to work as a veterinary practitioner and do research on clinical animal diseases in Bangladesh.