CHAPTER I: INTRODUCTION

Poultry sector is one of the fastest growing agricultural sector for global meat production, consumption, and trade, with developing and transition economies playing a vital role in its expansion. Bangladesh posses a large and rapidly expanding poultry sector. Poultry rearing can play an important role in a country like Bangladesh where most of the people are landless, disadvantaged and devoid of formal education or skill to participate in income generating activities. In comparison to other livestock, Poultry requires less investment to start the farming. Persons from low income group may also start the business on a small scale. Poultry farming offer the opportunities for fulfillment or part-time employment particularly women, children or elderly person on the farm operation (Banerjee, 2004). As the human population increases, broiler farms provide meat that supplies the human body with high quality proteins. Poultry farms are fast-paced operations that can fulfill the demand for meat and eggs, and can be expended easily to meet the ever growing demand (Dr. M. Farran, personal communication, 2009). Proper management ensures efficient production and good quality products (meat and eggs). This is accomplished by controlling diseases, maintaining feed efficiency, proper handling of wastes, and proper sanitizing of the poultry house (Islam et al, 2014). The number of poultry grew at an annual rate of 6.7 percent over the period 1990-97. Over 1993-94 there were only 43,589 poultry firms, which increased substantially to reach a number of 150,000 by the year 2006-07, but due to either avain infiuenza or higher feed prices, the number of firms reduced to 55,000 in 2013 from 1,15,000 in 2007 (Raha,2014). Another source reported that there were about 65,902 poultry farms up to February 2013 in the country (BER, 2013 p.104).

The broiler has fast growing character and high feed conversion ratio with pliable meat. Feed conversion ratio (FCR) is a measure of how well a flock converts feed intake into live weight and provides an indicator of management performance, and also profit at any given feed cost. Feed is typically the most costly expense in broiler production, feed represent about 60-70% of the total cost of broiler production (Hossain *et al.*, 2011).The efficient conversion of feed into live weight is essential for profitability, and small changes in FCR at any given feed price can have a

substantial impact on financial margins. The conversion of feed to live weight is a complex process and the cause of a poor or high FCR is usually multi-factorial that are management, health and nutrition. For measurement of nutritional status of commercial poultry feed available and used in Anwara upazilla I analysed four broiler feed named ACI, Nourish, Newhope and kazi feed.

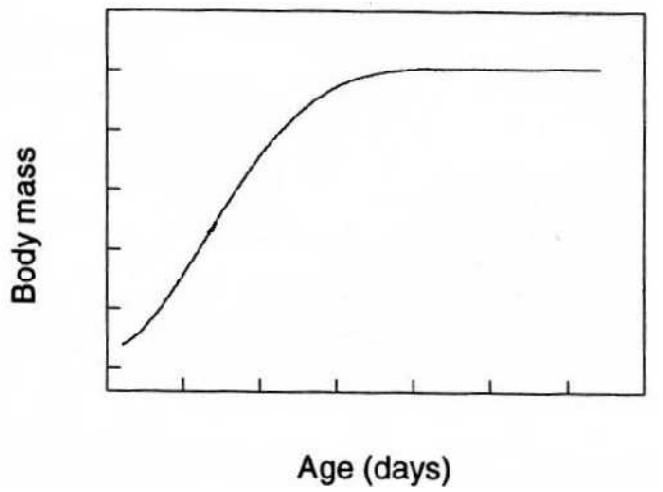


Fig 1 : Typical growth curve for broiler

Over the time industry has moved from a simple measure of bird weight, to weight for age, mortality, FCR, and more recently production efficiency factor (PEF) and unit profitability (UP). Together with growth rate, days to market and mortality, feed efficiency has been considered as one of the important parameters in assessing the potential of bird strain or feeding program etc (Leeson, 2000).Broilers experience a period a rapid growth early in their development .At very early age of broiler they need more protein for their growth and development, requirement for protein is gradually decline with increase requirement of metabolizable energy. This is then followed by a slow rate of growth as more feed is used in maintaining the already existing body structure. As a result, feed efficiency is much better in the first weeks of broiler production and then declines with increased target market weight.

Table 1: Nutrient requirement of broiler at different stage of life is given below:

Name of nutrients	Broiler starter (0-14)days	Broiler Grower (15-28)days	Broiler Finisher
Moisture	12 %	12 %	12 %
Crude protein	22 %	21 %	20 %
Crude Fiber	3.5 %	3.5 %	3.5 %
Crude fat	5.5 %	5 %	6.5 %
Methionine	0.5 %	0.45 %	0.4 %
Lysine	1.2 %	1.1 %	1 %
Calcium	1%	0.95 %	0.9 %
Phosphorus	0.5 %	0.45 %	0.4 %
Metabolizable energy (kacl/kg)	3000	3100	3200

Source: National Research Council,

There are about 175 commercial broiler farms present in the Anwara upazila. Most of the farmers have small to medium size broiler farm with 1000 to 2500 birds. All farmers rear their bird under intensive farming system. They use the vaccination schedule of that hatchery from where the chicks are brought. Farmer use different company feeds, ACI feed, Nourish feed, New hope feed, Kazi feed, CP feed, Aftab feed etc are mainly used poultry feed in this upazila.

The objectives of this study were :

1) To study the management of commercial broiler farming at Anwara upazila.
2) Comparative study of the nutrients contents of different commercial poultry feeds used in Anwara Upazilla with the standards.
3) To know the feed intake and FCR of broiler chicken.
4) To know the income from broiler rearing.

CHAPTER II: MATERIALS AND METHODS

2.1 Study Area and period:

This study was conducted at Anwara upazila in Chittagong district where broiler poultry farming is growing up.Four medium intensive poultry farms were considered for this study. This study was carried out from 22nd March 2015 to 20 May 2015 during my internship period at Animal nutrition laboratory, CVASU.

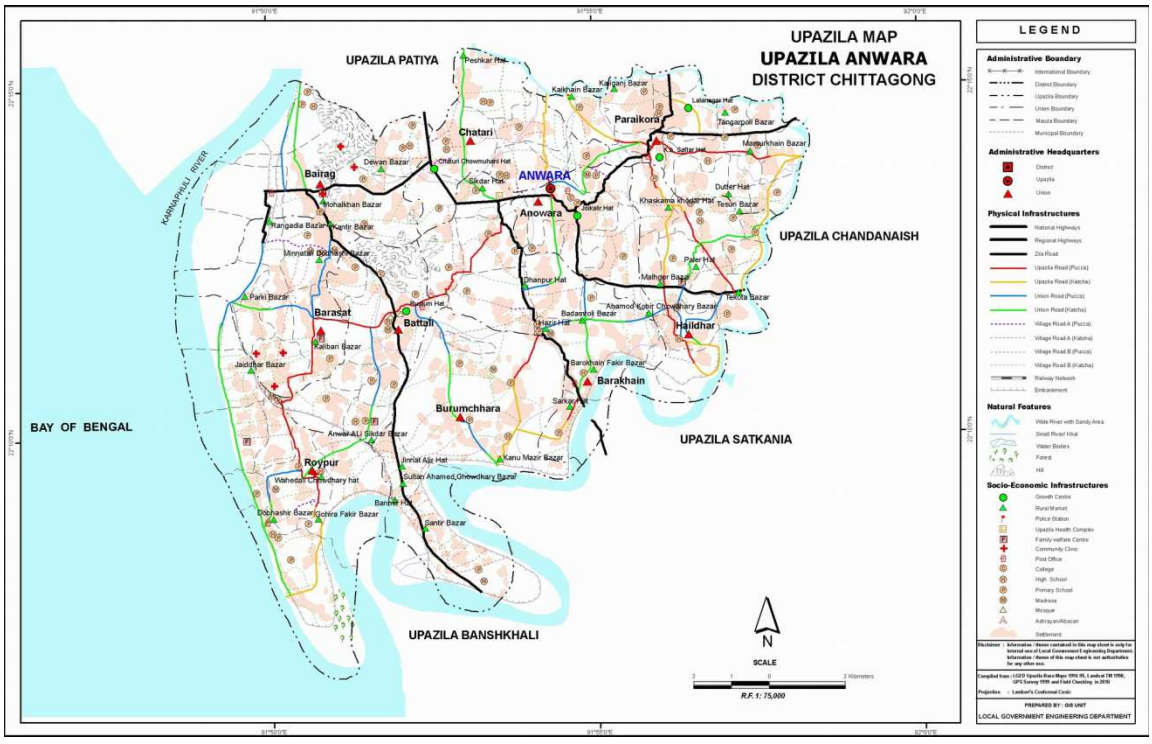


Fig 2.1(a): Map of Study area

2.2 Study design**:**

Four medium sized farm named Helal poultry, Pervez poultry, Shalauddin poultry and Younus poultry farms where I visited and collected data. These four farms used ACI, New hope, Nourish and Kazi feed respectively.

2.3 Sample collection:

Four different feed samples were collected from four broiler farms which were randomly selected and located scatteredly in different areas of Anwara Upazila at Chittagong district. All four collected feed samples were commercially available named ACI, Nourish, Newhope and Kazi feed in the form of both mash and pellet.

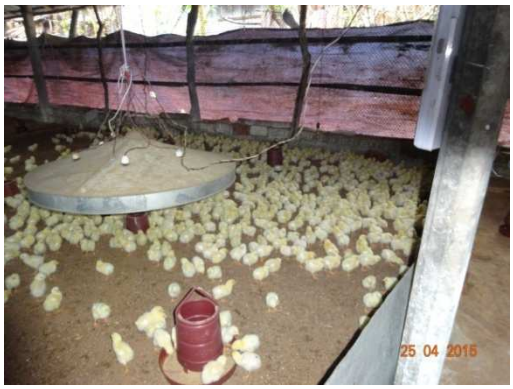


Fig 2.2: 5 days old chicks

Fig 2.3: 15 days old chicks

2.4 Methods:

2.4.1Proximate Analysis of feed:

Proximate Analysis of collected feed samples were carried for dry matter (DM), moisture, total ash (TA), crude protein (CP), crude fibre (CF),ether extract (EE).

2.4.2 Estimation of DM and Moisture:

The enamel disc or crucible was dried in an oven regulated at 105°C which was cooled in a dessicator and weighted. 5 gm of feed sample was weighted into the enamel disc and kept into the oven for 24 hours. The enamel disc was removed from the oven with metal tong. After that it was cooled in dessicator and the final weight was taken after getting constant weight (AOAC, 1990).

$$\%DM = \frac{Weight\ of\ crucible\ with\ dry\ sample - Weight\ of\ empty\ crucible}{Weight\ of\ feed\ sample} \times 100$$

%Moisture = 100 - %DM

2.4.3 Estimation of Ash:

The crucible was cleaned and dried in hot air oven. Than it was cooled in dessicator and weighted. 5gm of feed sample was placed there and the sample was burned up to no smoke in heater. The crucible with sample was cooled and transferred to the muffle furnace. Then the sample was ignited at 550-600°C for 6-8 hours until white ash. The furnace was cooled at 150°C and the sample was transferred to dessicator and weighted (AOAC, 1990).

$$\%Ash = \frac{Weight\ of\ crucible\ and\ ash - Weight\ of\ crucible}{Weight\ of\ feed\ sample} \times 100$$

2.4.4 Estimation of Crude Fibre (CF):

2 gm of feed sample was weighted and taken into a beaker. 125 ml of 1.25% H_2SO_4 was added into the beaker. Then it was fitted in condenser and placed on heater. After that it was cooled and filtered through filtering cloth. The sample was washed until it was free from acid. Residue of sample was transferred into same beaker. 125 ml of 1.25% NaOH was added there and again fitted in condenser and placed on heater. It was boiled for 30 minutes and removed from heater which was cooled and filtered through filtering cloth. The sample was washed until it was free from alkali. The residue of sample was transferred in a previously weighted crucible. The crucible was into the muffle furnace and ignited at 600^0C temperature for 5 hours. Then it was weighted after cooling.

$$\%CF = \frac{Wt\ of\ CF}{Weight\ of\ feed\ sample} \times 100$$

$$= \frac{Wt\ of\ crucible\ with\ dry\ sample - Wt\ of\ crucible\ with\ ash}{Wt\ of\ feed\ sample} \times 100$$

2.4.5 Estimation of Crude Protein (CP):

0.5 gm sample was weighted and one spoonful of catalyzer mixer (KOH, NaOH, Se) was added there. 10 ml concentrated H_2SO_4 was added and the digestion flask was placed in Kjeldahl Digestion Set. After that heat was increased gradually and continued up to clear residue (45 min to 1 hr). The flask was removed and cooled. 10 ml 2% boric acid solution, 2 drops mixed indicator were taken in a conical flask. The conical flask was fitted in the collection arm of distillation set. 50 ml distilled H_2O was added in the digestion tube and fitted in the distillation flask. 40 ml of 40% NaOH was added there and the distillation was continued up to 100ml of distillate.

The distillate was titrated against 0.1 N HCl. Titration was continued until the color changed into pink. Then the titration volume was calculated **(**AOAC, 1990).

$$\% \text{ CP} = \frac{(Titre - Blank) \times Normality\ of\ HCl \times 14.007 \times 6.25}{Wt\ of\ sample} \times 100$$

Replication of all four samples was done for accurate result.

2.4.6 Estimation of Ether Extracts (EE):

One gram dry sample was taken in an extraction thimble having porocity, then placed in the Soxhlet flask. The cork of thimble was above the syphone tube. A receiving flask was weighted and fitted with Soxhlet apparatus and was placed in water bath at 50^0 to 60^0 C. Ether extract was poured down in to the soxhlet falsk. The flask was filled up to ¾th portion with ether and it was sured that water was running through the condenser. When extraction was over, the thimble with sample was removed and heated in the water bath to remove all the ether from receiving flask. The receiving flask was placed into the oven at 105^0C to eliminate left of the ether and water. After drying, the flask was taken out and weighted (AOAC, 1990).

$$\%\text{EE} = \frac{Initial\ wt - Weight\ after\ extraction}{Sample\ wt} \times 100$$

2.4.7 Calculation of Nitrogen Free Extracts (NFE):

The NFE content was calculated by deducing the sum of the values for moisture, crude protein, crude fibre ether extracts, total mineral matter in 100 (Raghuramulu *et al*., 1983).

%NFE = 100 – (%Moisture +%CF + %CP + %EE + %Ash)

2.4.8 Metabolizable Energy (ME):

The ME was calculated by using following formula (Lodhi *et al*., 1976).

$$ME\ (Kcal/kg) = 32.959\ \{\%CP + (\%EE \times 2.25) + \%NFE\} - 29.20$$

2.5 Data collection :

For calculating relationship between feed intake and growth rate I have to collect data like amount of feed taken and weight gain on day 5,day 15 and day 30.I visited those farm to measure weight from where I have collected feed sample, I have selected bird randomly for weighing.1000 birds for every farm were considered for this study.

2.6 Feed intake, body weight and feed conversion ratio: Feed intake (FI) and body weight was measured at day 5,day 15 and day 30.Feed intake was determined as the difference between the amount of feed offered and refusals. Feed Conversion Ratio (kg feed/kg gain) was calculated by dividing FI with BW gain (Mwale et al., 2008). The FCR was determined at end of the study.

FCR=Feed intake/Weight gain

CHAPTER IV: IMAGE GALLERY

Fig 3.1 (a,b):Estimation of DM

Fig 3.2(c,d): Estimation of EE

Fig 3.3(e,f):Estimation of CP

CHAPTER III: RESULT AND DISCUSSION

3.1 Result of Proximate analysis of feed:

My first target was to measure the nutrient components of four poultry feed by proximate analysis to check either they met the requirement of poultry at different stage of life or not. So, the result of proximate analysis is given below:

Table 2: Nutrient components of four poultry feed:

Name of feed	DM (%)	Moisture (%)	Ash (%)	CP (%)	CF (%)	EE (%)	NFE (%)	ME (Kcal/Kg)
ACI	84.8	15.2	6	17.7	4.5	3.9	52.7	2580.33
New Hope	91	9	6.4	21.9	4	3.2	55.5	2759.13
Nourish	89	11	5.8	22.2	4	3	54	2704.75
Kazi	84	16	6.4	22.6	2	4.3	48.7	2639.75

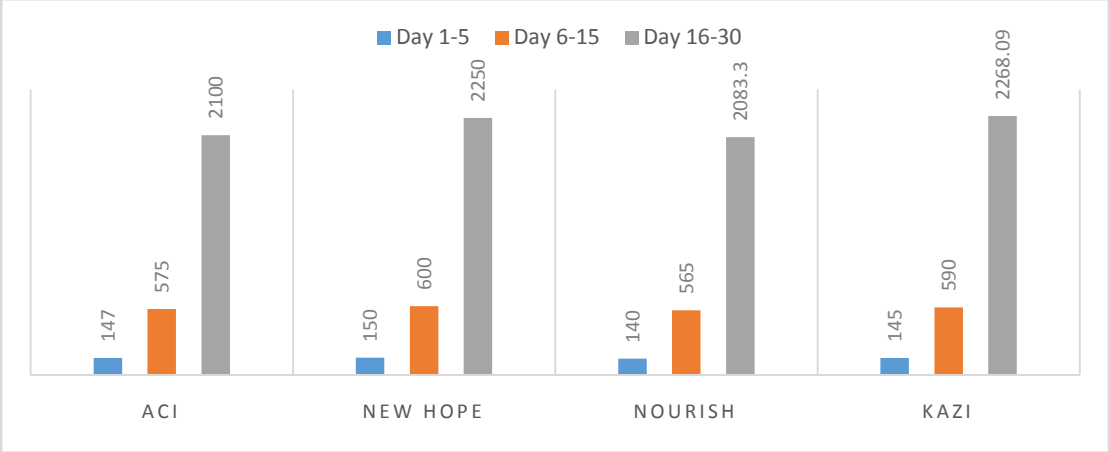
There is specific requirement of nutrient in certain stage of life of a species. Requirment of nutrient is higher in early phase of life when the animal is in growing stage. At grower stage of life (0-4 weeks of age) poultry require 21-22% crude protein and 3000-3100 kcal/kg metabolizable energy (National research council,1994).From the result of my proximate analysis I have found that New hope, Kazi and Nourish feed contain approximately 21-22% CP which is similar to requirement. On the other hand ,all of these four feed contain lesser amount of ME than the requirement. There is a balance on ME and CP of Nourish feed so it might provide good response on performance of broiler chicken.

3.2: Feed intake:

Intake of feed at first 5 days,15 days and up to 30 days at four different farms who used four different feeds are given below:

Table 3: Total intake of four feeds in four farms:

Total intake of feed (gm/bird)				
Age	ACI	New hope	Nourish	Kazi
Day 1-5	147	150	140	145
Day 6-15	575	600	565	590
Day 16-30	2100	2250	2083.3	2268.09



Graph-1: Relationship between times and feed intake (gm) in four farms

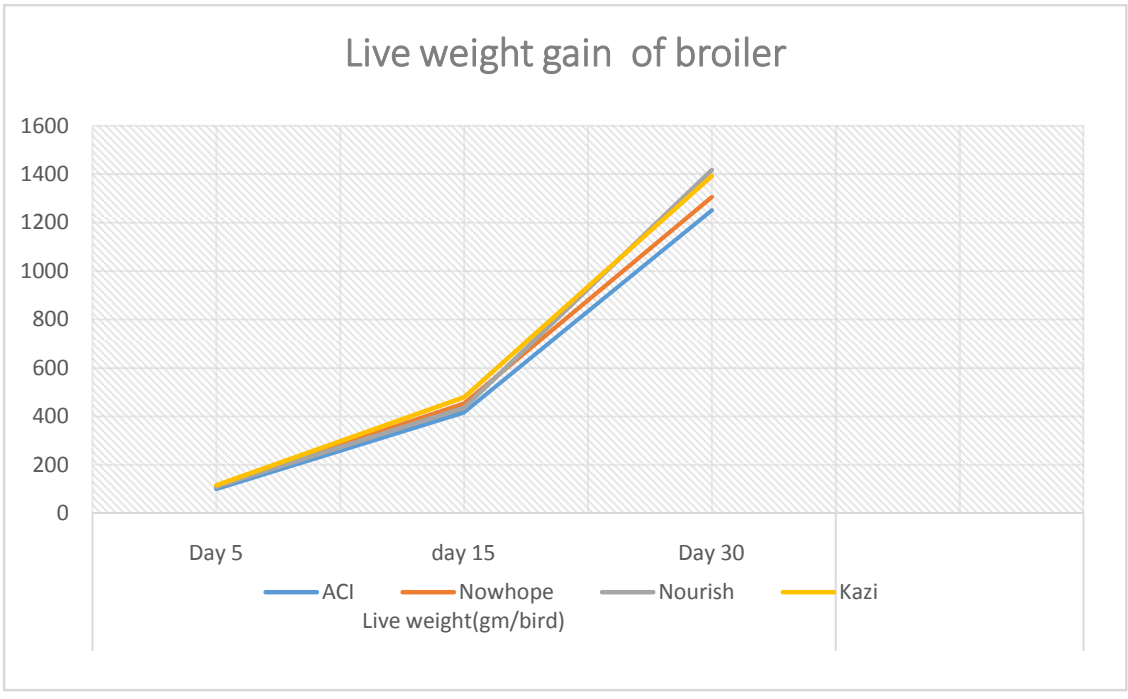
This data showed the mean of feed intake among the four farms 2175.35 gm/bird where highest feed intake was recorded at Younus poultry farm (Kazi feed,2268.09 gm/bird) and the lowest at Shalauddin poultry farm (Nourish feed,2083.3 gm/bird).There was no association (p=0.69) between time and amount of feed. The group who has kazi feed is trend to high feed consumption.

3.3: Live weight gain of poultry:

Growth of poultry depends on intake of feed, nutrient contents of feed and management of farm. Generally farmer choose A grade day old chick whose average weight was more than 40 gm. Physically sound chicks grew rapidly after having proper amount of quality feed.

Table 4: Live weight gain of broiler

Live weight gain(gm/bird)					
	Time	ACI	New hope	Nourish	Kazi
	Day 5	100	110	110	115
	Day 15	416	452	435	479
	Day 16-30	1250	1305	1416.6	1391.47



Graph-2: Growth of broiler in four farms used four different feeds

From the table it was shown that highest body weight gain was recorded from Shalauddin poultry farm (1416.6 gm/bird) who used Nourish feed and the lowest body weight in the Helal poultry farm (1250 gm/bird) who used ACI feed . The table also showed that the body weight increased with age in the entire studied farm. The result was supported by Hossain *et al.,* (2006) but somewhat varies from (Roy *et al.,* 2004). From the graph 2 it could be seen that live weight gain was steadily progressed. The live weight gain was increased simultaneously with the increase of ages.

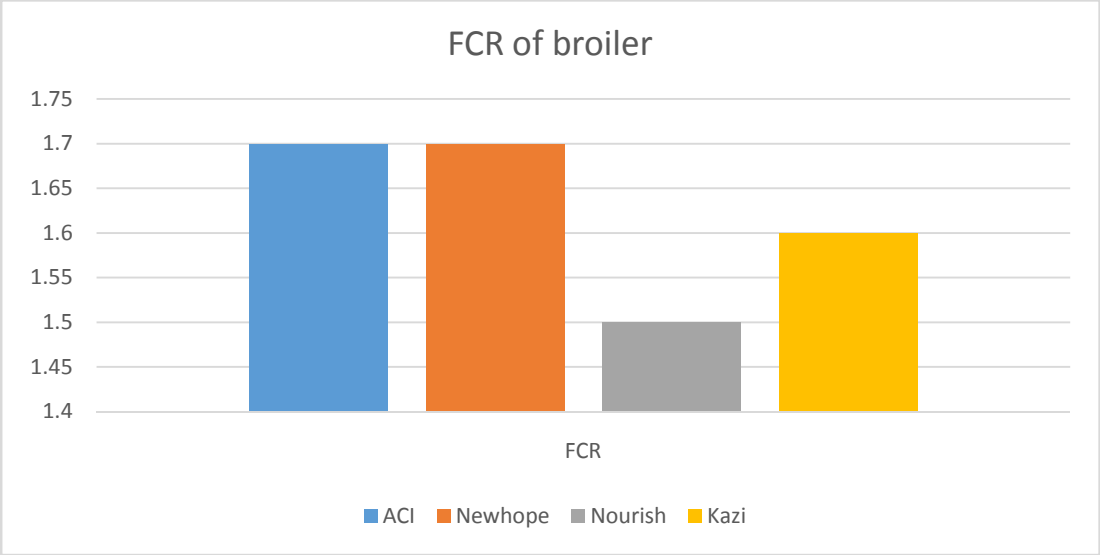
3.4: Feed conversion ratio :

Feed conversion is one of the most important factor for analysis of efficiency of feed and profitability of a farm.I have studied FCR of four different farms who used to fed four different company feeds.

Table 5: FCR of four farm broiler

Name of feed	Feed conversion	Mean	SD
ACI	1.7	1.63	0.095
New hope	1.7		
Nourish	1.5		
Kazi	1.6		

Data analysis: STATA corp.13.0



Graph-3: FCR of four different farm who used four different feed

Lowest FCR is the most important factor for farm profitability. In this study effect of four feed in four different farms were investigated. This study revealed lowest FCR (1.5) in case of Nourish feed used by Shalauddin poultry farm ,highest FCR was found in case of ACI and Newhope feed (1.7).The mean FCR was 1.63 which was similar to Hossain et al (2006).There was a negative correlation (r=-0.56) between CP and FCR. That means fed to higher CP (within inclusion level) containing feed reveal lower FCR and Vice versa. ME and FCR was also negatively correlated (r=-0.16).

LIMITATION

Though this study was carried out with sophisticated instruments and by maintaining standard protocol of Proximate analysis, it also had some limitations:

- As the farms are large the farmer was unable to give accurate data.
- For easy calculation I have to convert the data and consider for 1000 bird, so error in feed intake may occur.
- Through proximate analysis, we can estimate total N_2, not the ultimate protein & NPN (Non Protein Nitrogenous Substance). To calculate Protein content of feed we multiply the nitrogen content with 6.25, so sometime error may happened during estimation of nitrogen.
- We can not estimate vitamins, calcium and phosphorus level of feed by using this method.
- Any deviation in results may be due to environmental or experimental error.
- The study area was also limited.
- It was not all possible to get economic date from record sheet of those farms exactly because most interviews were done over phone call. So some deviation from exact data was occurred.
- Poor management of farm may increase FCR.
- Deviation from standard nutrient contents gave higher FCR.

CONCLUSION

Feed conversion ratio (FCR) is affected by the intake of feed, rate of growth of birds; contents of ration, efficiency of feed, nutrient adequacy of the ration, management of poultry, environmental temperature, health condition of the birds. The meat production depends on mainly FCR. FCR increased with the increase of age. Problems of FCR represent a real waste to the broiler farmer and have a significant economic impact. Any factor which reduces the feed intake, growth or health of the broiler will worsen flock FCR. Correcting an FCR problem requires communication and coordination across the whole production unit, from feed manufacturer to farmer and processor. Proper amount of nutrients in feed may give proper weight if all management remain accurate. Nourish feed having 22.2% CP and 2704.75 kcal/kg ME fulfill the requirement of grower and gave good result in compare to other three feed.ACI feed was the worst quality feed having 17.7% CP and 2580.33 kcal/kg ME. After fulfilling of grower requirement Nourish feed gave lowest FCR (1.5:1) while highest FCR found in case of ACI and Newhope feed (1.7:1).

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ACKNOWLEDGEMENT

All praise and deepest sense of gratefulness goes to Almighty Allah, who enables me to complete my work successfully on short period of my internship program.

I would like to express my deep gratitude and heartfelt appreciation to my supervisor Prof. Goutam Buddha Das, Department of Animal Sciences and Nutrition, Chittagong Veterinary & Animal Sciences University for his guidance and cordial cooperation in all phases of this study.

The author is expressing his profound gratitude, gratefulness and heartfelt appreciation to all faculty member of Dept. of Animal Sciences and Nutrition for their cordial help,support ,kind cooperation and advice during laboratory work .

The author is immensely grateful to her family member,all friends and well-wishers for their support during the total course of work, although it is not possible to mention every one by name.

The author

November,2015

ANNEX

A.Basic information:

1. Name of the farm
2. Total population
3. Chick's Hatchery

B. Management of farm:

1. 1.Total management from first to last day of a batch
2. Name Feed used
3. Feeding schedule and amount of feed
4. Medication

C. Data collection

Table : Raw data collected from farmer:

Name of farm	Feed used	Number of bird	Day 5(gm/bird)		Day 15(gm/bird)		Day 30(gm/bird)		Total feed (bag)
			Feed	Weight	Feed	Weight	Feed	Weight	
Helal poultry	ACI	1120	147	100	575	416	2100	1250	47
Pervez Poultry	New Hope	1000	150	110	600	452	2250	1305	45
Shalauddin Poultry	Nourish	1355	140	110	565	435	2083.3	1416.6	56.5
Younus Poultry	Kazi	1065	145	115	590	479	2268.09	1391.47	45.5

BIOGRAPHY

I am Jabin Sultana, Intern student Faculty of Veterinary Medicine, Chittagong Veterinary And Animal Sciences University. During our one year internship we have to submit a production report on any aspect of livestock production .Bangladesh is an agricultural country and now poultry farming is growing up in Anwara Upazila, I have completed my production report on Nutritional status of commercial broiler in Anwara Upazilla, Chittagong. Having a dream to do help to the farmer and poor people, I am looking forward to be a successful Veterinarian.