

## **Chapter 1: Introduction**

Poultry sector is one of the fastest growing agricultural sub-sectors for global meat production and consumption. Bangladesh possesses a large and rapidly expanding poultry sector. There are about 320.6 million chickens available in Bangladesh (BBS, 2016) on which Raozan, Chittagong district has total 0.4 million chickens (Personal communication, DLS, 2018). The normal requirement of animal protein as meat for a human is about 62.5 gm per day (BER, 2013). Poultry rearing plays an important role for improving the nutritional status of the Bangladeshi people through reducing the gap of protein supply within a short period of time. Therefore, to meet up the protein scarcity within shortest possible time, emphasis should be given on intensive poultry farming. Before 3 decades poultry was reared as a backyard farming system and a few numbers of poultry was reared by the rural people for their own consumption of meat and eggs. Nowadays the commercial poultry become popular for income generation, employment opportunity. Poultry plays an important role in the economic development of the country.

However, the growth of commercial poultry was started after eighties and then it has been growing very fast. In early nineties a number of private farms started to produce commercial day-old broiler and layer chicks in the country. The commercial poultry farming is getting more popularity, huge employment opportunities are being created among the rural farmers, retailers, traders, various support servicemen, businessmen etc. A total 5 million people are working in this sector of different farm size (Saleque, 2007). 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).

Broiler industry is a rapidly growing enterprise in Bangladesh. Among the sector of poultry industry broiler industry are growing fast. Broiler chicken attains 2kg live weight at 6-8 weeks of age. The production of meat depends on various factors such as nutrition, feed intake. The feed conversion efficiency is the ratio of amount of feed intake and the total live weight of birds. In Bangladesh on the basis of management and weather condition, the feed conversion efficiency (FCR) of broiler bird is usually 2.00-2.75:1 that is average feed conversion efficiency is 2.38:1.

Currently, about 85% private hatcheries produce only broiler DOC (Day-Old Chicks) whereas 15% hatcheries produce both broiler and layer DOC. The broiler parent stock farms are purchasing Parent Stock (PS) DOC both from home (53%) and abroad (47%). The available breeds are Hubbard classic, Cobb-500, Hybro (PN and PG) and Ross (Saleque, 2007). The commercial broiler day-old chicks produced by the parent stock farms and hatcheries are sold to the farms mainly through agents. The quality of chicks varies from hatchery to hatchery and breed to breed. Poultry enterprise having 100-500 birds are considered as small, 501-5000 birds as medium and more than 5000 as large farms. The commercial farms in our country are usually small to medium with some large farm also. These are concentrated mainly around the large cities and semi urban areas and to some extent to the rural areas. There are about 60-70% are the production costs is feed costs. Mainly the feed utilization by the broilers determines the farming profitability. In broiler feed conversion ratio (FCR), feed conversion rate (FCR) or feed conversion efficiency (FCE) is a measure

of bird efficiency in converting feed mass increased body mass. Especially FCR is the mass of the food eaten divided by the body mass gain, all over a specified period of time. Birds that have low FCR are considered efficient users of feed.

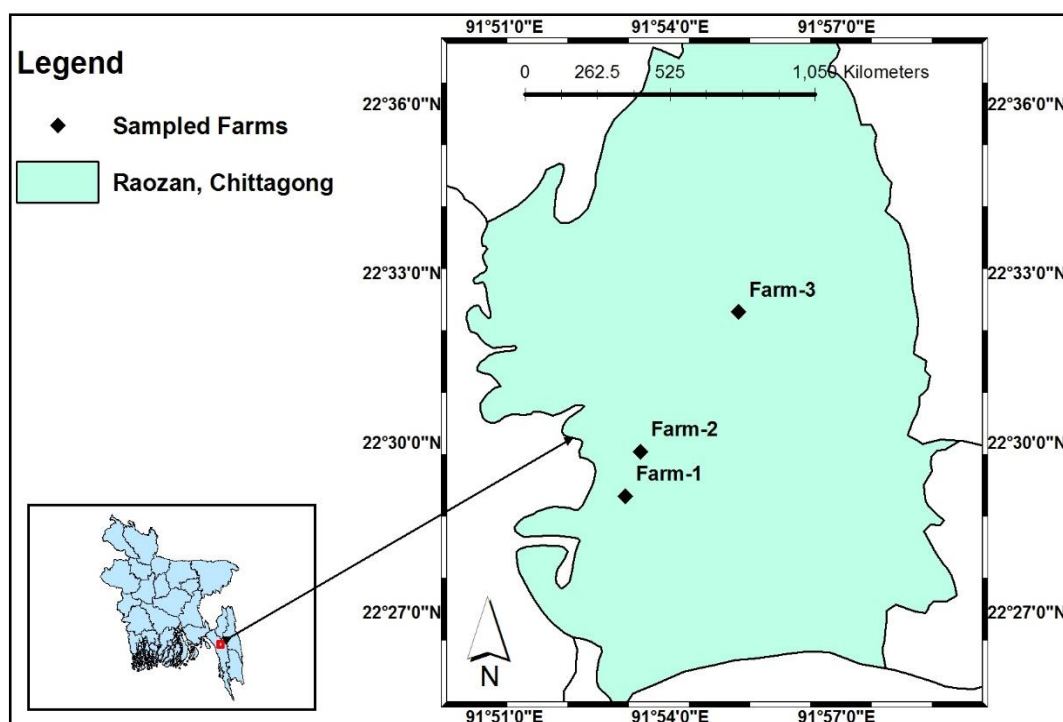
Feed intake and feed conversion efficiency (FCR) are affected by rate of growth of birds; contents of ration, nutrient adequacy of the ration, environmental temperature, health condition of the birds. The meat production depends on mainly FCR. There are about 4182 commercial broiler farms, 439 layer farms and 20 breeder farms present in Chittagong district (Personal communication, DLS, 2018). Most of the farmers have small to medium size broiler farm with 1000 to 3000 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 such as Advance feed, ACI feed, Nourish feed, Euro feed, Kazi feed, CP feed, Aftab feed etc. in this upazila. In Bangladesh, there were abundant study was available on broiler parent stocks and the effects on different feed and nutrients for growth of broiler farm. However, very little number of studies is about the FCR on commercial broiler farms. Therefore, the present study was undertaken with the following objectives

1. To know the feed intake of broilers under different commercial feeds (CP feed, Nourish feed and Euro feed)
2. To know the live weight and live weight gain of broilers.
3. To estimate the Feed Conversion Ratio (FCR) of broilers.

## Chapter 2: Materials and Method

### 2.1 Study area

This study was conducted at Raozan upazilla in Chittagong district where broiler farming is growing up. Raozan is located in between latitude 22.32 to longitude 91.56. Three medium intensive poultry farms were considered for this study (**Fig: 1**).



**Fig 1:** Study area (Raozan, Chittagong) with farms location

### 2.2 Study Period

The study was carried out from 1<sup>st</sup> February to 29<sup>th</sup> March, 2018.

### 2.3 Data collection

The data were collected from record book of Sadeque poultry farm, Nasir poultry farm and Vai vai poultry farm. These three farms used CP, Nourish and Euro feed respectively. They procured the day old chicks from hatchery. After purchasing the

chicks they were reared this broiler under intensive management system up to market. The live weight of chicks was recorded at day old and every week up to 4 weeks of age. Feed intake and live weight gain of each flock were recorded weekly to know the average feed intake and weight gain of the broilers.

#### **2.4 Data analysis:**

The feed conversion ratio was calculated from average feed intake and the total live weight gain in the poultry farm (Mwale et al., 2008). The formula is:

$$\text{Feed conversion ratio (FCR)} = \frac{\text{Total feed intake}}{\text{Total body weight gain}}$$

The mean, standard deviation was calculated by using Microsoft Excel-2007. The line graph was prepared by using Microsoft Excel-2007.

## Chapter 3: Results and Discussion

### 3.1 Live weight and live weight gain

The live weight and live weight gain of broilers under 3 intensive farms who used CP, Nourish and Euro feed respectively are presented in (Table 1) and the rate of weight gains (time vs. live weight) are shown in Graph 1, Graph 2 and Graph 3 correspondingly. All 3 graphs show that live weight of broilers were gradually incline with the increase of age in all farms. The  $R^2$  values were very high (Graph 1, 2 and 3), which indicated the weight gain of broilers were steady and good fitted with the liner regression. From this (Table 1), it was seen that the broilers of all 3 farms were increased live weight with the increases of age.

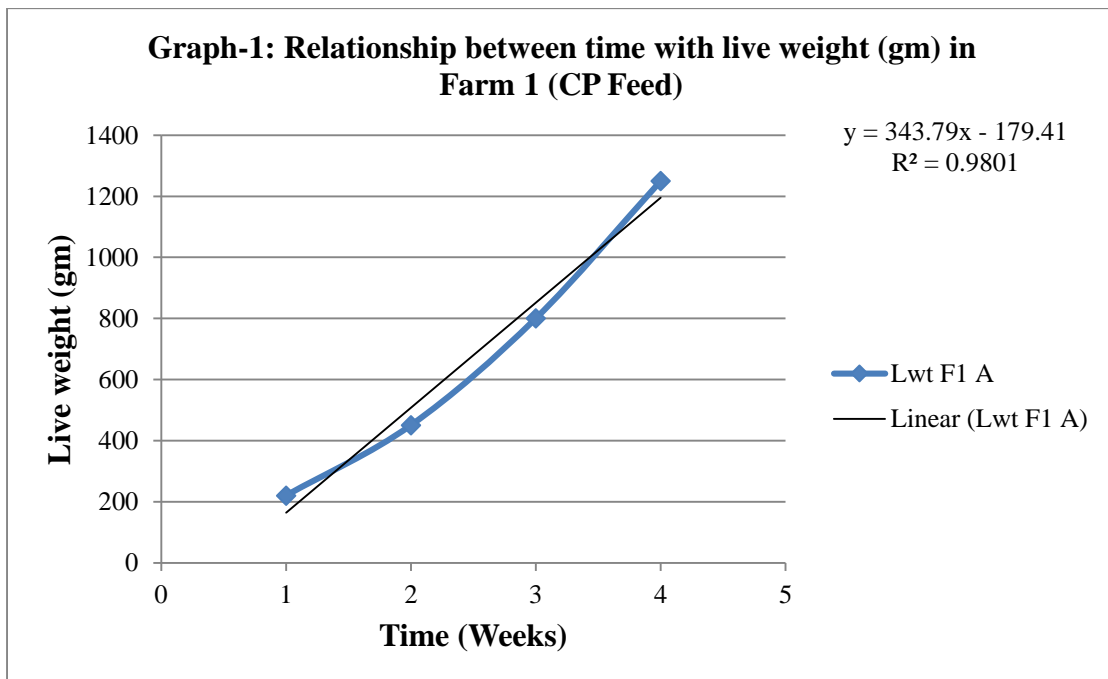
**Table 1: Effect of live weight and weight gain of broilers in different farms**

Age (wks)	Mean Live Weight of birds/wk (gm)			Mean live weight gain of birds/wk (gm)		
	Farm 1 (CP Feed)	Farm 2 (Nourish feed)	Farm 3 (Euro feed)	Farm 1 (CP Feed)	Farm 2 (Nourish feed)	Farm 3 (Euro feed)
Day old	39.9±0.96	39.87±1.44	40.18±1.20			
1 <sup>st</sup>	220.12±2.56	240.43±3.06	240.99±3.04	180.22±2.36	200.56±2.62	200.81±2.67
2 <sup>nd</sup>	450.53±2.98	500.02±3.15	600.3±3.60	270.31±4.80	299.46±4.10	399.49±5.17
3 <sup>rd</sup>	800.03±3.70	950.14±3.35	1104.47±3.54	349.5±3.49	450.12±6.04	504.34±5.14
4 <sup>th</sup>	1249.58±5.48	1500.42±4.14	1650.81±4.67	449.55±7.39	550.27±6.57	546.34±5.14

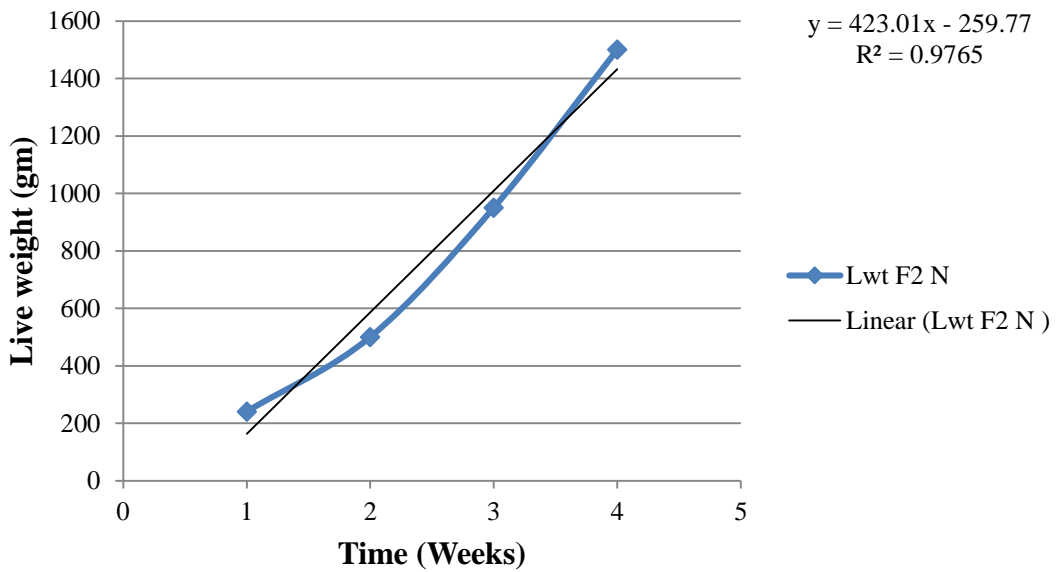
The differences of live weight among three farms may cause the differences for nutrition, management, breeds and age effects of the broilers. Similar factors were reported by other researchers (Saleque, 2007). From the table it was shown that highest body weight was recorded from Vai vai poultry farm (1650.81 gm/bird) who

used Euro feed and lowest body weight in the Sadeque poultry farm (1249.58 gm/bird) who used CP feed after 4 weeks of age. From the (**Table 1**), it could be seen that weight gain of broilers in each farms were gradually increase with increase of age. The result was supported by (Hossain et al., 2006) but somewhat varies from (Roy et al., 2006). The overall body weight gain of the Farm-1, Farm-2 and Farm-3 were 312.39 gm/bird, 375.11 gm/bird and 412.75 gm/bird respectively.

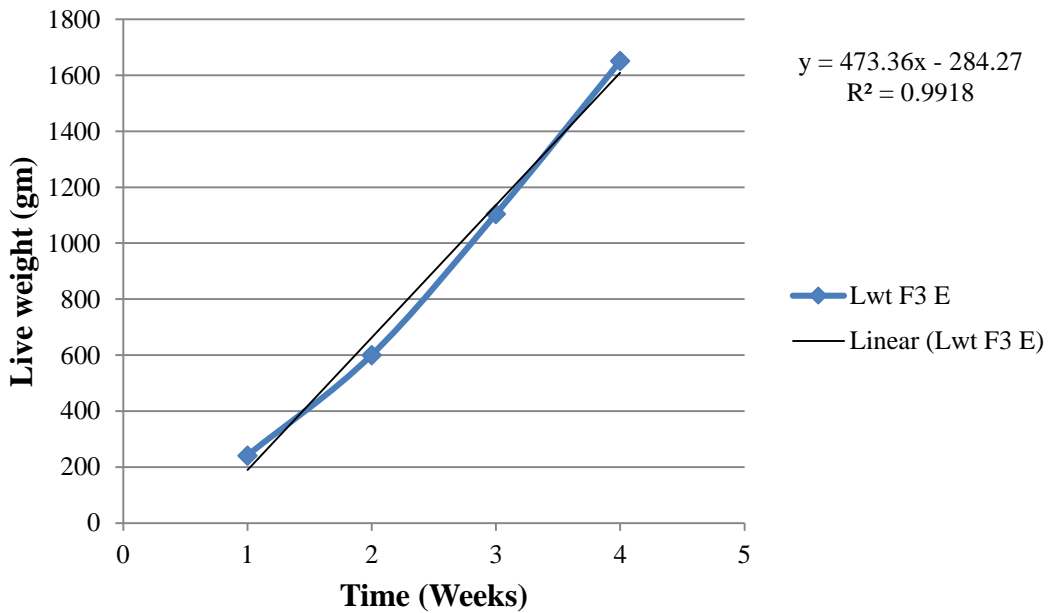
This study conducted that the live weight of commercial broiler at 4<sup>th</sup> weeks of age in Farm-1, Farm-2 and Farm-3 are 1249.58 gm/bird, 1500.42 gm/bird and 1650.81 gm/bird which are varies from the research of (Shahidullah et al., 2008) who found that the live weight of commercial broiler at 4<sup>th</sup> weeks age is 1450 gm/bird but the study found higher body weight than the report of (Sarkar et al., 2008) who reported 1200 gm/bird at 4<sup>th</sup> weeks of age.



**Graph-2: Relationship between time with live weight (gm) in Farm 2 (Nourish Feed)**



**Graph-3: Relationship between time with live weight (gm) in Farm 3 (Euro Feed)**





### 3.2 Feed intake and feed conversion ratio

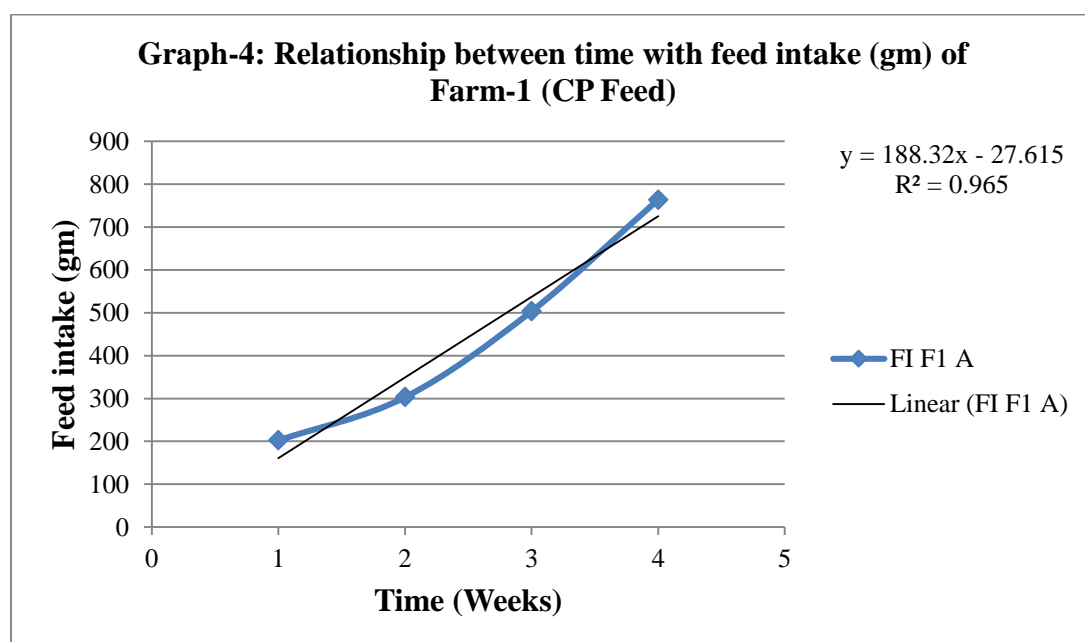
The average weekly feed intake and feed conversion efficiency (FCR) of broilers under 3 intensive farms who used CP, Nourish and Euro feed respectively are presented in (Table 2) and the rate of feed intake (time vs. feed intake) are shown in graph-4, graph-5 and graph-6. The graphs show that feed intake of broilers was gradually incline with the increase of age in both farms. The higher R<sup>2</sup> values indicated that the feed intake of broilers was good fitted with the linear regression. From this Table 2, it was seen that the broilers of Farm-1, Farm-2 and Farm-3 were increased feed intake with the increases of age. However, the broilers of Farm-3 showed higher feed intake than other 2 farms but at 4<sup>th</sup> weeks of age Farm-2 showed more feed intake (914.1 gm/bird) than Farm-1 (763.53 gm/bird) and Farm-3 (874.92 gm/bird). These differences may cause the differences for nutrition, management, breeds and age effect. Similar factors were reported by (Saleque, 2007).

**Table 2: Effect of feed intake and FCR on different farms**

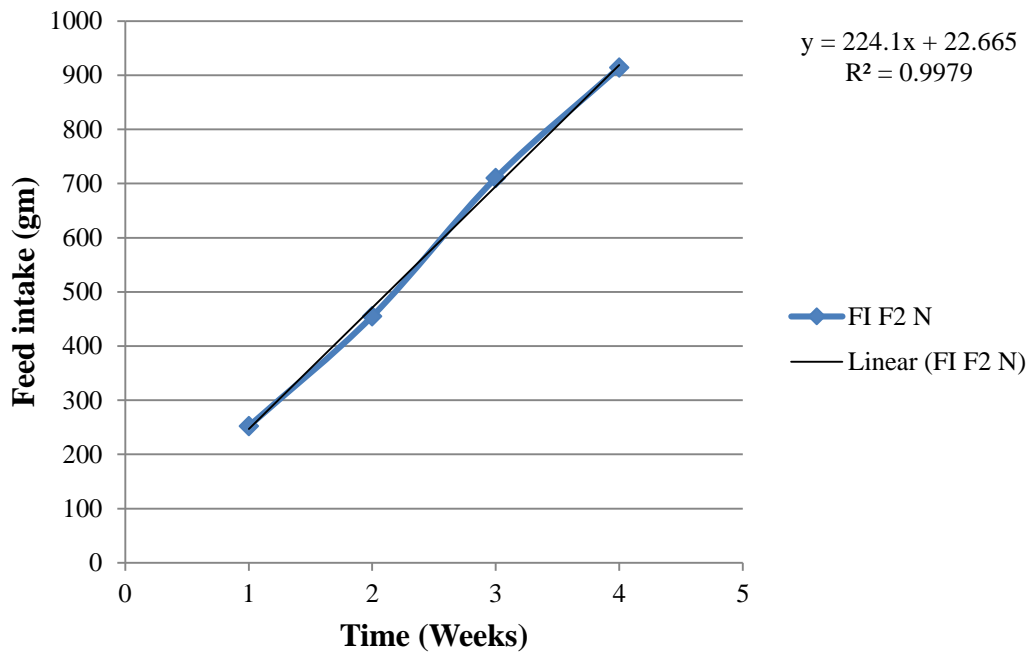
Age (wks)	Mean Feed intake of birds/week			FCR		
	Farm 1 (CP Feed)	Farm 2 (Nourish feed)	Farm 3 (Euro feed)	Farm 1 (CP Feed)	Farm 2 (Nourish feed)	Farm 3 (Euro feed)
1 <sup>st</sup>	202.55±1.03	252.14±1.35	227.83±0.95	1.12	1.25	1.13
2 <sup>nd</sup>	303.2±2.14	455.15±1.11	550.04±1.77	1.12	1.52	1.37
3 <sup>rd</sup>	503.49±1.10	710.31±1.19	736.07±0.98	1.44	1.57	1.46
4 <sup>th</sup>	763.53±0.89	914.1±0.64	874.92±0.98	1.69	1.66	1.60

The **Table 2** shows the feed intake of broiler at 4<sup>th</sup> of age, among the three farms where highest feed intake was recorded at Nasir poultry farm (Nourish feed, 914.1 gm/bird) and the lowest at Sadeque poultry farm (CP feed, 763.53 gm/bird). From the **Table 2**, it could be seen that FCR of broilers in each farms were gradually incline with increase of age. That indicates that with the increase of age the broiler consumes higher amount of feed that conversion into meat. The overall feed conversion efficiency of the Farm-1, Farm-2 and Farm-3 were 1.69:1, 1.66:1 and 1.60:1 respectively. Among them highest FCR was found in Sadeque poultry farm and lowest in Vai vai poultry farm.

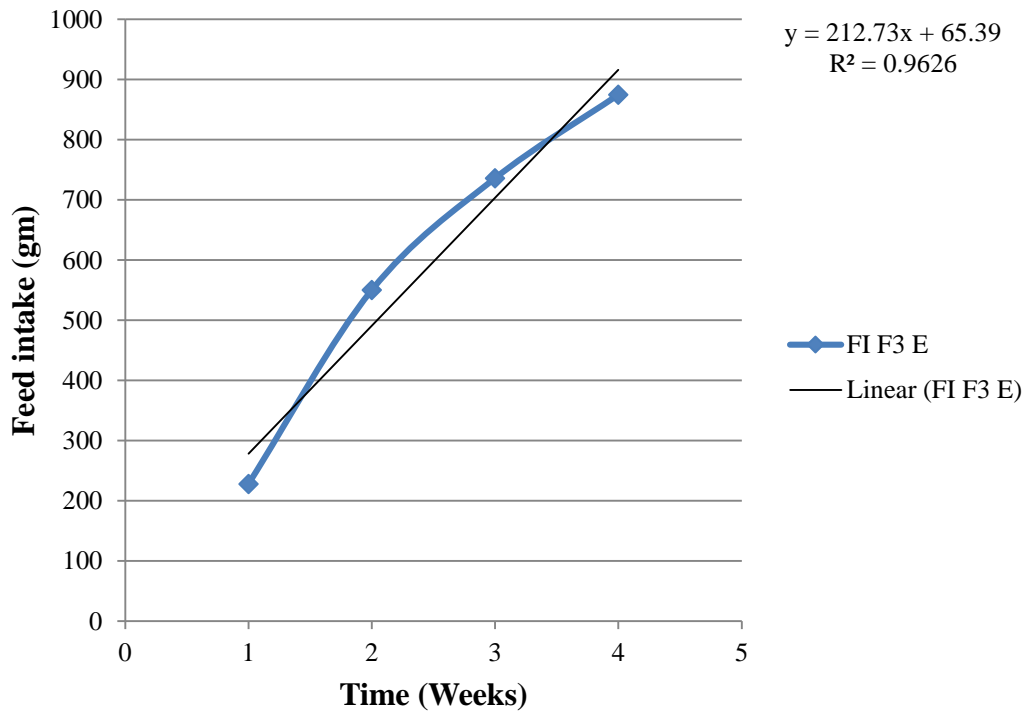
This study found that the FCR of broilers in Farm-1, Farm-2 and Farm-3 are 1.69:1, 1.66:1 and 1.60:1 respectively at 4<sup>th</sup> weeks age which are less than the research of (Goliomytis et al., 2003) who found the FCR 1.78:1. (Sarkar et al., 2008) reported that the FCR of commercial broiler is 1.62:1 at 28 days but this study found that the FCR of commercial broilers are 1.69:1, 1.66:1 and 1.60:1 at 28 days whereas Farm-1 and Farm-2 shows higher and Farm-3 presents lower FCR than (Sarkar et al., 2008).



**Graph-5: Relationship between time with feed intake (gm) of Farm-2 (Nourish Feed)**



**Graph-6: Relationship between time with feed intake (gm) of Farm-3 (Euro Feed)**



## **Chapter 4: 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 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 FCR problem requires communication and coordination across the whole production unit, from manufacture to farmer and processor. Euro feed gives good result in compare to other two feeds. It has lower FCR (1.60:1) and higher weight gain (1650.81 gm/bird) than remaining two feeds.

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Author

## **Biography**

I am Shanta Barua, daughter of Professor Dr. Ranjit Kumar Barua and Professor Paramita Barua. I passed my Secondary School Certificate (SSC) examination from Dr. Khastogir Govt. Girls' High School, Chittagong in 2009 and Higher Secondary Certificate (HSC) examination from Chittagong Govt. women's college, Chittagong in 2011. I enrolled for Doctor of Veterinary Medicine (DVM) degree in Chittagong Veterinary and Animal Sciences University (CVASU), Chittagong, Bangladesh in 2012-13 session. At present I am doing my internship program which is compulsory for awarding my degree of DVM from CVASU. In the near future, I would like to work and have massive interest in wildlife medicine, wildlife and conservation of nature.



## Appendix-1



**Fig 2:** Broiler farm of Raozan, Chittagong



**Fig 3:** Brooding of day old chicks (DOC)



**Fig 4:** Weighing chickens of farm-1



**Fig 5:** Weighing chickens of farm-2



**Fig 6:** Weighing chickens of farm-3



**Fig 7:** Collecting information from farmers