A Production report of Feed Conversion Ratio (FCR) on commercial broiler farm

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Contents

ABSTRACT

The study makes an attempt to know the actual feed conversion ratio(FCR) of poultry farms at Shibganj upazila, Bogura. There are about 60-70% are the production costs is feed cost.Mainly the feed utilization by 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. The data was collected from record book of Sarkar poultry farm, Hasan poultry farm and Tithi poultry farm.These three farms used CP, Nourish and Euro feed respectively.The following of the study is going to portray a picture on overall FCR of these farms and help understanding the importance of FCR.

Introduction

Poultry sector is one of the fastest growing agricultural sub-sectors for global meat production and consumption. Bangladesh posseses a large and rapidly expanding poultry sector. There are about 320.6 million chickens are available in Bangladesh (BBS, 2016) on which Shibganj Upazila, Bogura district has total 1 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.

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.

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 4500 commercial broiler farms, more than 700 layer farms and 20 breeder farms present in Bogura district (Personal communication, DLS, 2018). 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 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.

Objectives

1. To evaluate the feed intake of broilers under different commercial feeds (CP feed, Nourish feed and Euro feed)

2. To examine the live weight and live weight gain of broilers.

3. To estimate the Feed Conversion Ratio (FCR) of broilers.

MATERIALS AND METHODS

Study area:

The necessary data were collected from the different unions of Shibganj upazila,Bogura district.

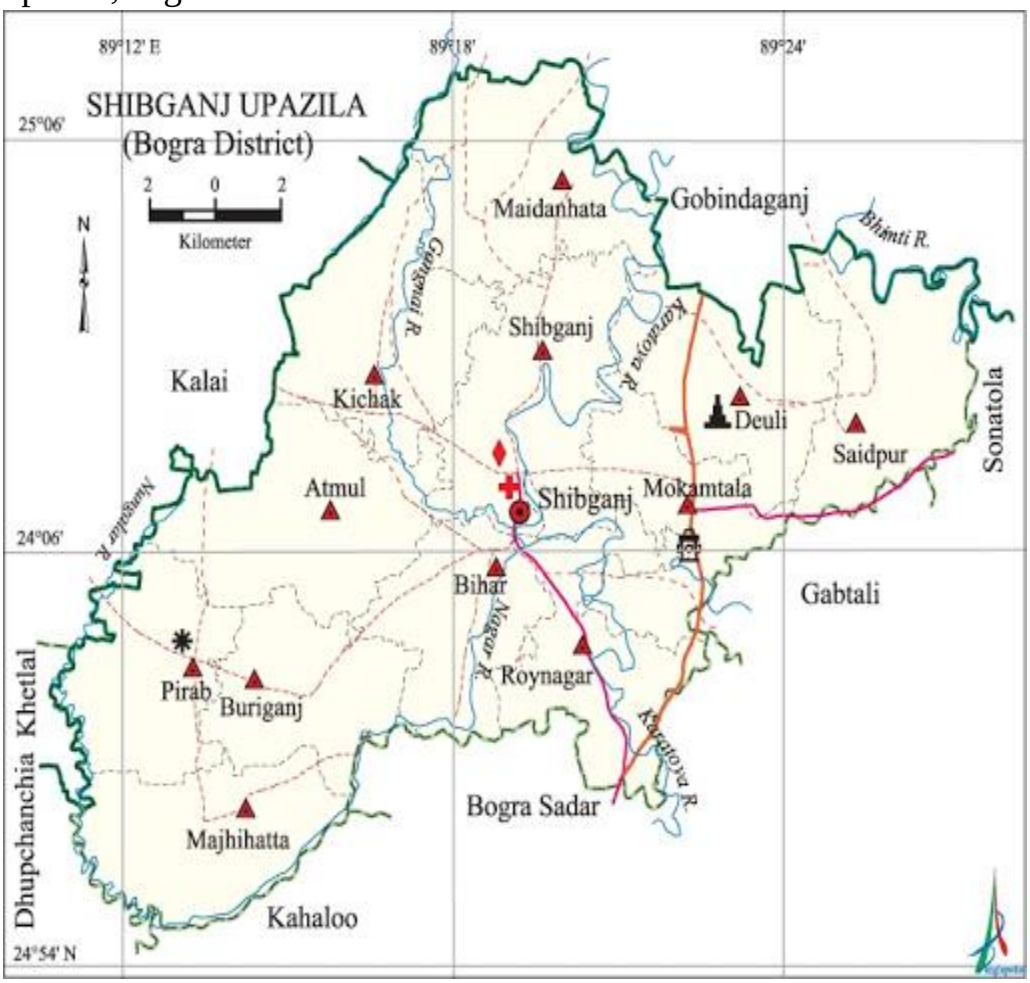


Figure:Shibganj Upazila,Bogura district

Time of study:

The study period was November, 2019 during internship placement.

2.3 Data collection

The data were collected from record book of Sarkar poultry farm, Hasan poultry farm and Tithi 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.

Results and Discussion

3.1 Live weight and live weight gain

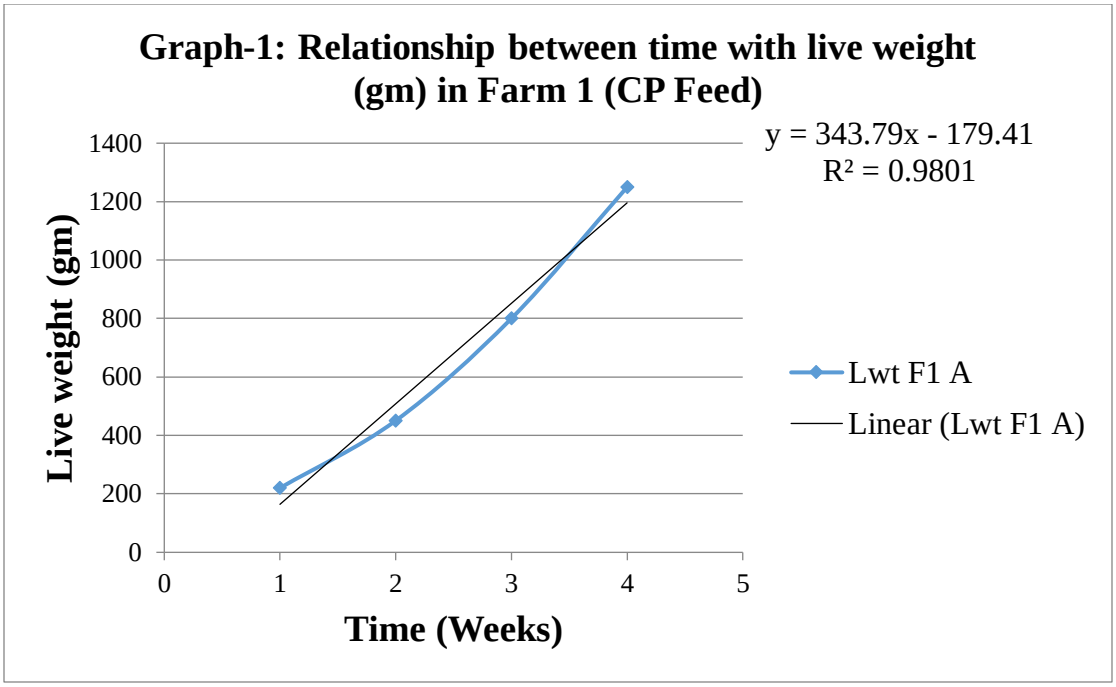
The live weight and live weight gain of broilers under 3 intensive farms who used CP, Nourish and Euro feed respectively are presented in (**Table 1**) and the rate of weight gains (time vs. live weight) are shown in Graph 1, Graph 2 and Graph 3 respectively. All 3 graphs show that live weight of broilers 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.

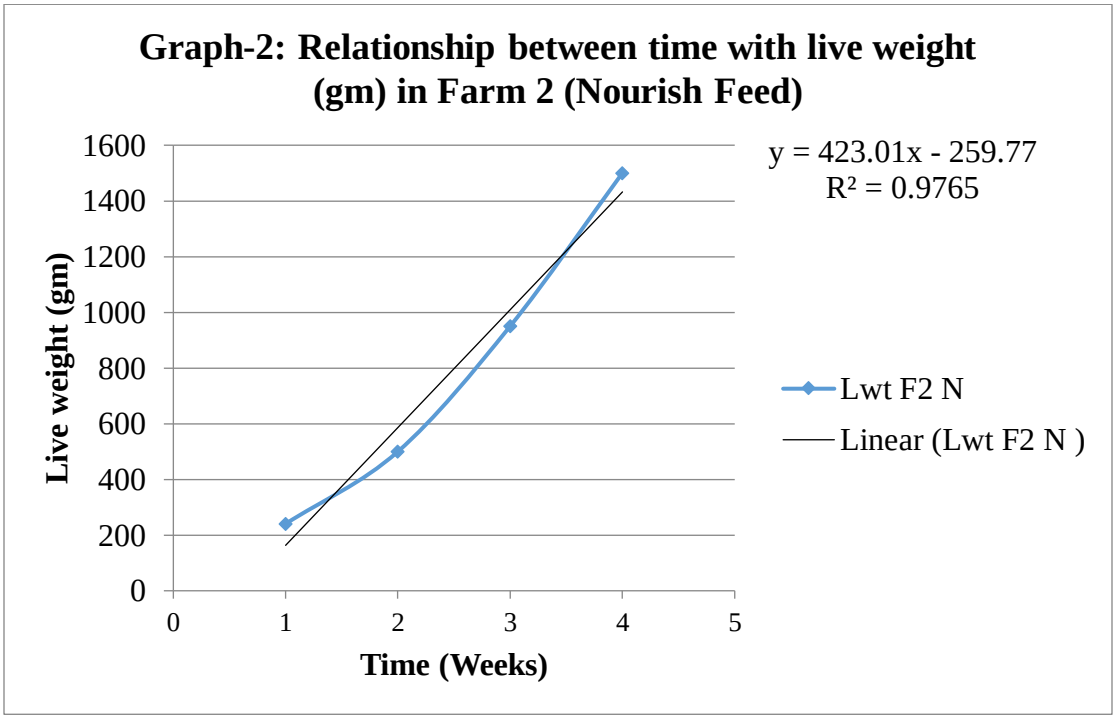
Table 1: Effect of live weight and weight gain of broilers in different farms

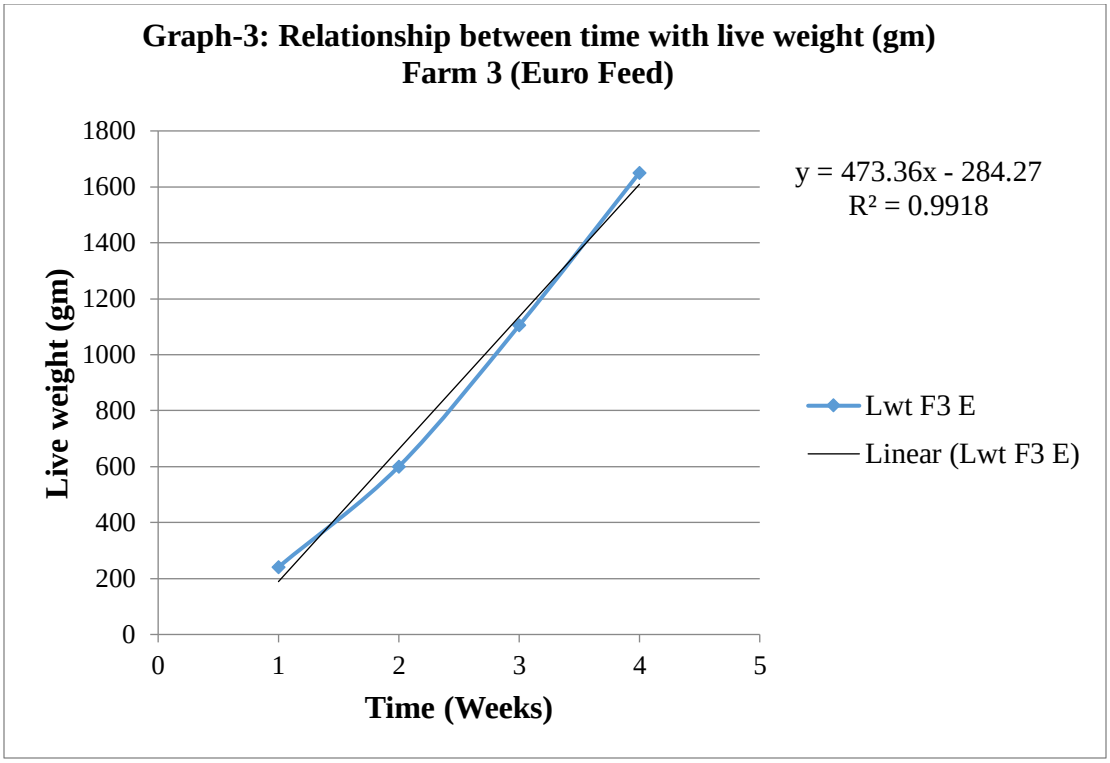
	Mean Live Weight of birds/wk (gm)			**Mean live weight gain of birds/wk (gm)**		
Age (wks)	Farm 1 (CP Feed)	Farm 2 (Nourish feed)	Farm 3 (Euro feed)	Farm 1 (CP Feed)	Farm 2 (Nourish feed)	Farm 3 (Euro feed)
Day old	39.9±0.96	39.87±1.44	40.18±1.20			
1st	220.12±2.56	240.43±3.06	240.99±3.04	180.22±2.36	200.56±2.62	200.81±2.67
2nd	450.53±2.98	500.02±3.15	600.3±3.60	270.31±4.80	299.46±4.10	399.49±5.17
3rd	800.03±3.70	950.14±3.35	1104.47±3.54	349.5±3.49	450.12±6.04	504.34±5.14
4th	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^{th} 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^{th} 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^{th} weeks of age.


Graph-1: Relationship between time with live weight (gm) in Farm 1 (CP Feed)
y = 343.79x - 179.41
R² = 0.9801
Live weight (gm)
Time (Weeks)
Lwt F1 A
Linear (Lwt F1 A)
0
200
400
600
800
1000
1200
1400
0
1
2
3
4
5


Graph-2: Relationship between time with live weight (gm) in Farm 2 (Nourish Feed)
y = 423.01x - 259.77
R² = 0.9765
Live weight (gm)
Time (Weeks)
Lwt F2 N
Linear (Lwt F2 N)
0
200
400
600
800
1000
1200
1400
1600
0
1
2
3
4
5



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^2 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^{th} 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).

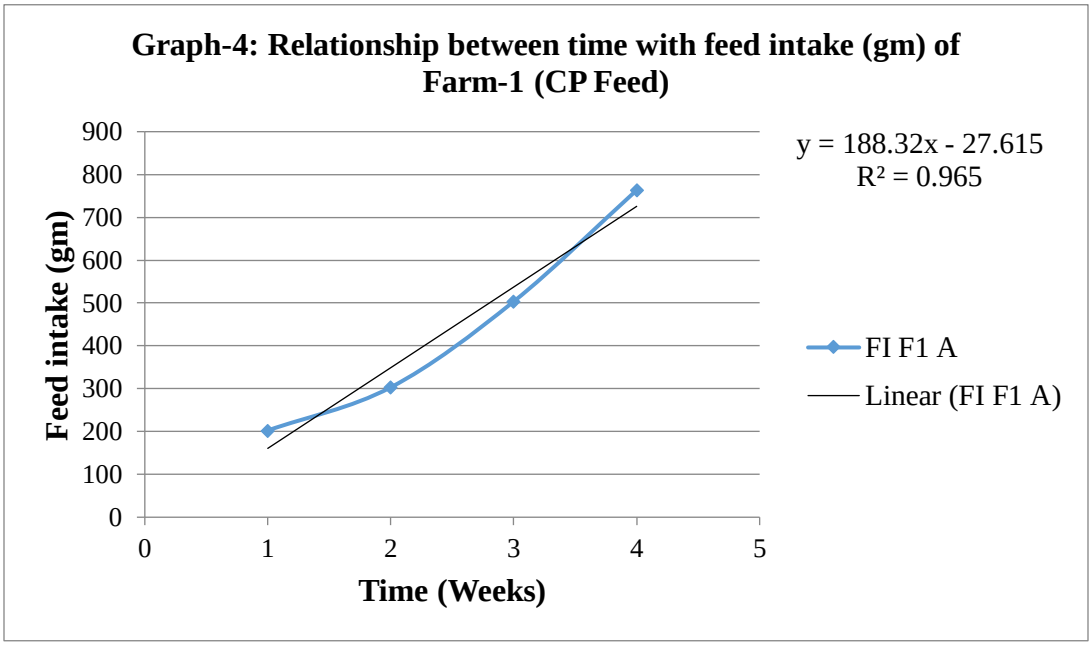
Table 2: Effect of feed intake and FCR on different farms

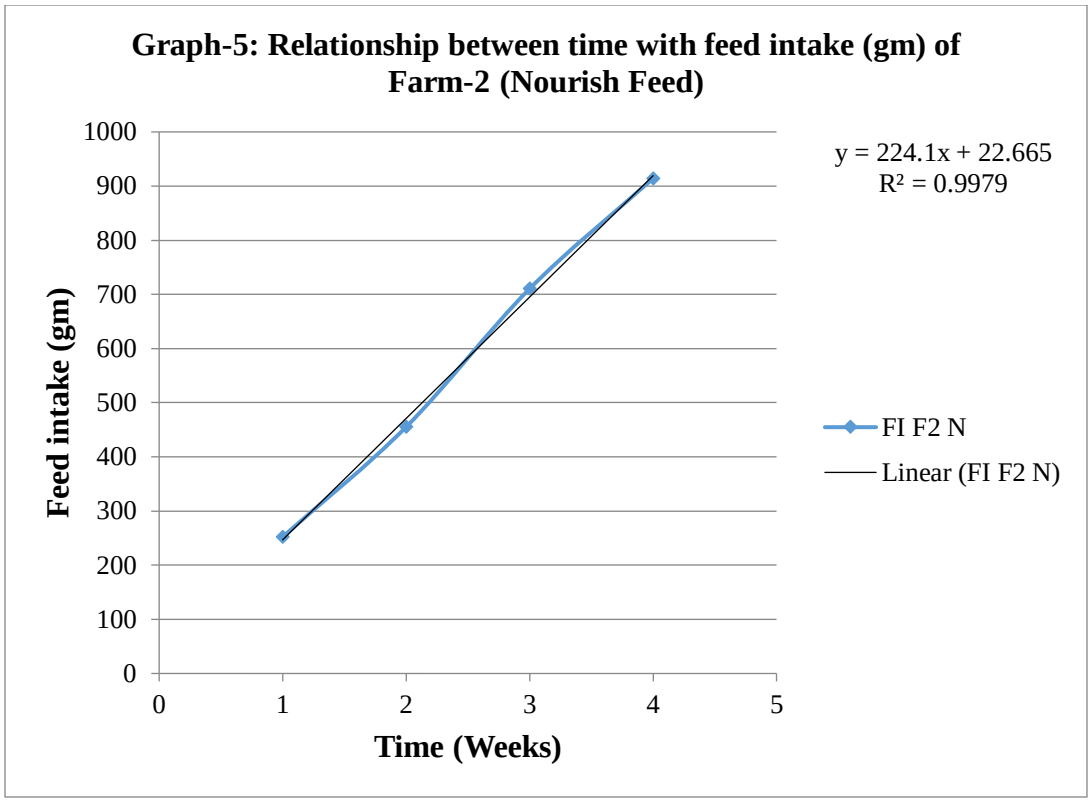
	Mean Feed intake of birds/week			**FCR**		
Age (wks)	Farm 1 (CP Feed)	Farm 2 (Nourish feed)	Farm 3 (Euro feed)	Farm 1 (CP Feed)	Farm 2 (Nourish feed)	Farm 3 (Euro feed)
1st	202.55±1.03	252.14±1.35	227.83±0.95	1.12	1.25	1.13
2nd	303.2±2.14	455.15±1.11	550.04±1.77	1.12	1.52	1.37
3rd	503.49±1.10	710.31±1.19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

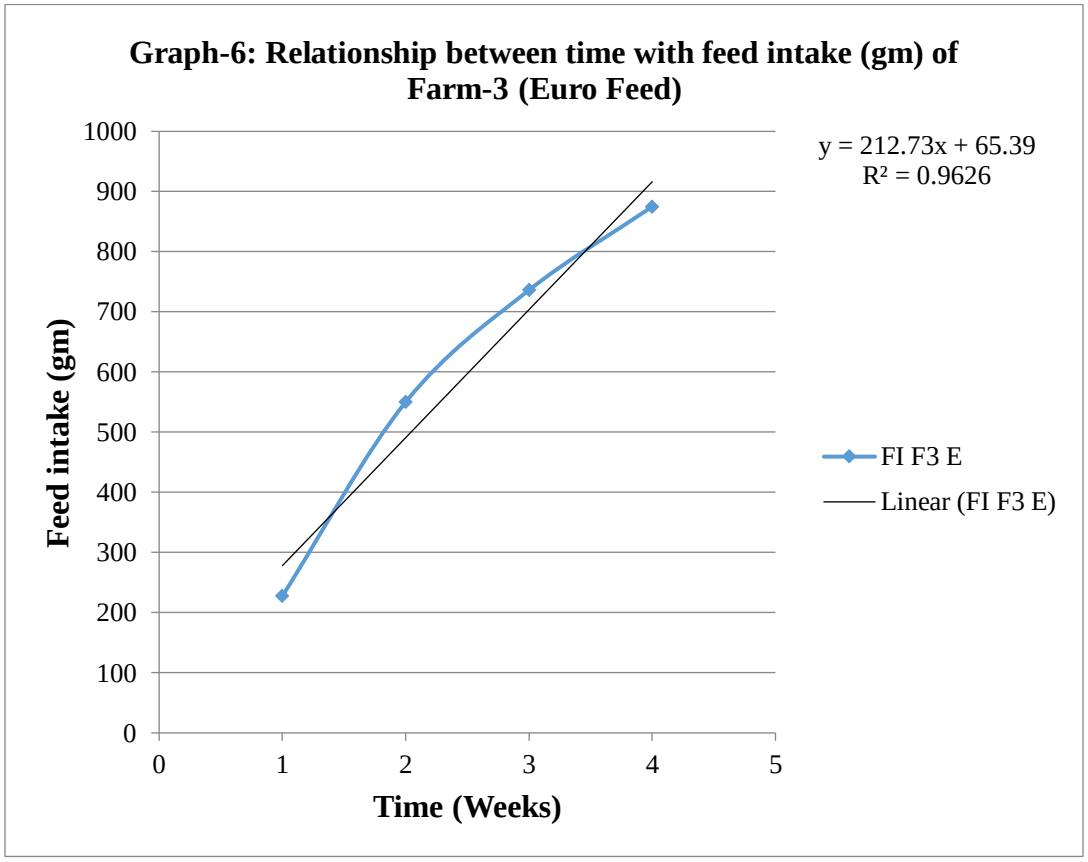
The **Table 2** shows the feed intake of broiler at 4th of age, among the three farms where highest feed intake was recorded at Nasir poultry farm (Nourish feed, 914.1 gm/bird) and the lowest at Sadeque poultry farm (CP feed, 763.53 gm/bird). From the **Table 2**, it could be seen that FCR of broilers 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 4th 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)
Feed intake (gm)
1000
900
800
700
600
500
400
300
200
100
0
0
1
2
3
4
5
Time (Weeks)
y = 224.1x + 22.665
R² = 0.9979
FI F2 N
Linear (FI F2 N)


Graph-6: Relationship between time with feed intake (gm) of Farm-3 (Euro Feed)
Feed intake (gm)
1000
900
800
700
600
500
400
300
200
100
0
0
1
2
3
4
5
Time (Weeks)
y = 212.73x + 65.39
R² = 0.9626
FI F3 E
Linear (FI F3 E)

Conclusion

Feed conversion ratio (FCR) is associated with 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 related to FCR creates an economic loss for broiler farmers.Any factor which reduces the feed intake, growth or health of the broiler will worsen flock FCR. Addressing to the issues relating FCR requires communication and coordination across the whole production unit, from manufacture to farmer and processor. Euro feed provides good result in compare to other two feeds as found in our study. It has lower FCR (1.60:1) and higher weight gain (1650.81 gm/bird) than remaining two feeds.

References

Bangladesh Bureau of Statistics (BBS), 2016. 2016 Yearbook of Agricultural Statistics of Bangladesh. Planning Division, Ministry of Planning. Government of the People's Republic of Bangladesh.

Bureau of Education and Research (BER), 2013. pp.104.

Goliomytis, M., Panopoulou, E. and Rogdakis, E., 2003. Growth curves for body weight and major component parts, feed consumption, and mortality of male broiler chickens raised to maturity. *Poultry science*, *82*(7), pp.1061-1068.

Hossain, M.A., Roy, B.C., Islam, M.M. and Miah, M.Y., 2006. Performance of broiler fed with different commercial compound feeds of Bangladesh. *Bangladesh Journal of Veterinary Medicine*, *4*(2), pp.97-101.

Islam, K. M., Uddin, F. M., and Alom, M. M., 2014. Challenges and Prospects of Poultry Industry in Bangladesh, European Journal of Business and Management ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online) Vol.6, pp.7.

Mwale, M., Mupangwa, J.F., Mapiye, C., Saina, H. and Chimvuramahwe, J., 2008. Growth performance of guinea fowl keets fed graded levels of baobab seed cake diets. *International journal of poultry science*, *7*(5), pp.429-432.

Raha, S.K., 2007. Broiler industry in Bangladesh: some issues. In *proceedings of the 5^< th> International Poultry Show and Seminar, Organized by World's Poultry Science Association, Bangladesh Branch, Dhaka, Bangladesh, from March 01-03, 2007*.

Roy, K.R., Chowdhury, S.D., Sultana, N., Moshad, M.A.A. and Hasan, M.N., 2006. Production potentiality and economics of rearing cockerels from a commercial layer strain. *Bangladesh. vet. J*, *23*(2), pp.83-87.

Saleque, Md. A., 2007. Poultry Industry in Bangladesh: Current Status and Its Challenges and Opportunity in the Emerging Market Environment. Poultry Business Directory 2007. Khamar Bichitra, Dhaka.

Shahidullah, M., Uddin, M. and Habib, M.A., 2008. Growth and Hematological changes of commercial birds fed on blood meal supplement with water. *J. Bangladesh Agri. Univ*, *6*, pp.321-326.

Sarkar, P.K., Chowdhury, S.D., Kabir, M.H. and Sarker, P.K., 2008. Comparative Study on the productivity and profitability of commercial broiler, cockerel of a layer strain and cross-bred (RIR× Fayoumi) Chicks. *Bangladesh Journal of Animal Science*, *37*(2), pp.89-98.

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The Author

Biography

I am Suvrodeb Barman, Son of Subal Chandra Barman and Suvra Shaha. I am from Bogura district,Rajshahi division, Bangladesh.I have completed my Secondary School Certificate (SSC) and Higher Secondary Certificate(HSC) from Biam Model school and college,Bogura. My SSC passing year was 2012 and HSC passing year was 2014. I enrolled for Doctor of Veterinary Medicine (DVM) degree in Chattogram Veterinary and Animal Sciences University (CVASU), Chattogram, Bangladesh in 2014-2015 session. At present I am doing my internship program which is compulsory for awarding my degree of Doctor of Veterinary Medicine (DVM) from CVASU. In the near future, I would like to work in livestock extension in whole Bangladesh.