**NUTRITIVE VALUE OF COMMERCIAL BROILER STARTER FEEDS**

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By:

**Sharif Ahamed**

**A Report by**

Roll No: 12/07; Reg. No: 00726

Intern ID: A-07; Session: 2011-2012

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Chittagong Veterinary and Animal Sciences University

Khulshi, Chittagong-4225, Bangladesh

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**Nutritive Value of Commercial Broiler Starter Feeds**

**Abstract**

The present study was undertaken to estimate the variations in chemical composition of different broiler starter feeds produced by different feed companies in different areas of Chittagong, Bangladesh. Test results of one hundred four different broiler starter feed samples from different feed companies were collected and compiled in Poultry Research and Training Centre laboratory, Chittagong Veterinary and Animal Sciences University, Chittagong, Bangladesh during October 2014 to December 2016. Samples were analyzed in triplicate for dry matter (DM), crude protein (CP), crude fiber (CF), ether extract (EE), total ash (TA), calcium (Ca) and phosphorus (P) in the PRTC laboratory. Results indicated that, there were variations for different parameters in all the samples. DM content varied from 8.6 to 12.9 g/100g, CP varied from 18.7 to 25.5 g/100g, CF varied from 2.9 to 7.5 g/100g, EE varied from 5.0 to 8.1 g/100g, TA varied from 5.2 to 8.1g/100g, Ca varied from 0.7 to 3.2 g/100g and P varied from 0.4 to 1.0 g/100g. It was concluded that broiler starter feeds should be analyzed before supply to the birds.

**Key words:** Broiler starter feed, CF, CP, DM, EE, TA

**Introduction**

Poultry production is an important part of animal agriculture. By increasing the productivity of poultry meat and eggs, the existing gap between supply and demand of animal protein can be bridged. Poultry meat contributes around 37% of the total animal protein supply of Bangladesh **(Ahmed and Islam, 1985)**. Poultry meat and eggs are quality food in respect amino acid ingredients and therefore, can improve considerably an otherwise unbalanced diet. It also provides cash income and creates employment opportunity for small and landless farmers. However, the high price and non availability of feed ingredients are two major constraints to the growth of commercial poultry enterprises. In Bangladesh, feed cost alone accounts 60-70% of the total production cost. About 80% feed stuffs used in poultry ration are imported from different countries. As a result, the cost of feed prepared for poultry using those grains are always high.

Feed quality and consistency are key issues for the broiler industry. It is well recognized that a change of diet often results in depression of bird performance. Such a negative impact may be associated with changes in the type of ingredients included in the diet and/or the suppliers of the ingredients. In particular, growing conditions, grain variety, grain storage and processing methods of by-products can cause a significant variation in the nutritive value of feed ingredients **(Choct and Hughes, 1999)**.

Broiler starter is in the small granule size which makes easy for the chicks to pick up the feed faster. Starter feed is designed in a very precise manner for healthy growth of the chick which carries high immunity to face the possible stresses like diseases, climate variation, vaccinations, handling etc. A bird requires 1 Kg. of starter feed to shift to finisher feed Rational balance of all required nutrients is maintained in this feed so as to get faster & maximum weight gain.

Broiler poultry birds are raised for commercial meat production. They convert foods to meat within a very short period of time. They have a good feed to meat converting ratio. So quality feeding is very important for maintaining a profitable [broiler poultry farming](http://www.roysfarm.com/broiler-poultry-farming/) business. Broilers require more energy and protein in their food. The main difference between [layer poultry feed](http://www.roysfarm.com/layer-poultry-feed/) and broiler poultry feed is that ‘broiler poultry needs more nutrient ingredients than layer poultry’. So broiler poultry feed must have to be enriched with highly nutrient ingredients.

Broiler Starter feeds are given to the chicks for 0-14 days of age. Broiler starter feed should contain proper amount of moisture, ME, CP, CF, Ca, P etc. The standard requirements of moisture, ME, CP, EE, CF, Ca and P should be 12 g/100gm,3000 kcal/kg, 22 g/100gm, 5.5 g/100gm, 4.5 g/100gm, 1 g/100gm and 0.5 g/100gm respectively. However, the composition varies widely. Therefore, the main objectives of the study were to analyze different broiler starter feeds available in market round the year.

**Materials and methods**

***Study area***

The study was carried out in the PRTC laboratory of Chittagong Veterinary and Animal Sciences University, Chittagong, Bangladesh during January to March of 2017.

***Collection of data***

During January to March 2017, secondary data of proximate analysis for 104 feed samples from different commercial broiler starter feed companies were collected. Name of the companies, address, sample ID, data of receipt, DM, CP, CF, EE, TA, Ca, P contents of the samples were recorded from laboratory register during October 2014 to December 2016.

***Analysis of data***

After collection, data were entered into the MS excel 2007. Data were sorted and compiled for further analysis. Sorting was done according to date of receiving sample. Data was analyzed for descriptive statistics i.e., mean, median, mode, maximum, minimum, standard deviation and standard error for DM, CP, CF, EE, TA, Ca and P. One sample t-test was carried out using reference values to analyze the data in SPSS 16.0 **(Winer *et al*., 1991).** Statistical significance was accepted at 5% level (P<0.05).

**Results and discussion**

Chemical composition i.e., DM, CP, CF, EE, TA, Ca and P of different broiler starter feeds have been presented in Table 1. Relevant results published from elsewhere have been discussed accordingly.

***Dry matter (DM)***

DM content differed significantly (p<0.001) among the feed samples. The average DM content of broiler starter feed estimated in this study was 89.9 % (Table 2). The maximum and minimum moisture percent obtained in current study were 12.86% and 8.62%, respectively (Table 2). The result is in close agreement with earlier study where it was 90.45% **(Vakili *et al*., 2015)**,and lower in some studies where it was 88.05±1.35 % **(Khan *et al*., 2008)**.

***Crude protein (CP)***

CP content differed significantly (p<0.001) among the feed samples. The average CP content of broiler starter feed estimated in this study was 22.9% (Table2). The maximum and minimum CP percent obtained in current study were 25.5% and 18.7% respectively (Table 2). The result is in close agreement with earlier studies where it was 23.59% **(Vakili *et al*., 2015)**, 23.9±2.48% for Aftab feed, 23.5±1.10% for quality feed, 22.2±0.41% for Paragon feed , 22.9±1.37 % for Nourish feed (**Roy *et al*., 2004)** but lower in some studies like 21.17±0.12% **(Khan *et al*., 2008)**.

***Crude fiber (CF)***

CF content differed significantly (p<0.001) among the feed samples. The average CF content of broiler starter feed estimated in this study was 5.4% (Table 2). The maximum and minimum CF percent obtained in current study were 7.5% and 2.87%, respectively (Table 2). The result is in close agreement with earlier studies where it was 4.77% **(Vakili *et al*., 2015)**, 4.70± 0. 66% for Aftab feed **(Roy *et al*., 2004)** but 6.40± 1.56% in quality feed **(Roy *et al*., 2004)** which is higher than the present study lower in some studies like 4.1% **(Khan *et al*., 2008)**.

***Ether extract (EE)***

EE content differed significantly (p<0.001) among the feed samples. The average EE content of broiler starter feed estimated in this study was 6.0% (Table 2). The maximum and minimum EE percent obtained in current study were 8.1% and 4.95%, respectively(Table 2). According to, The result is in close agreement with earlier studies where it was 6.70 ± 1.71% for Aftab feed, 5.30± 0.78% for Quality feed and 5.40± 0. 93% for Nourish feed (**Roy *et al*., 2004)** but higher in some earlier studies like 9.31±0.21% **(Khan *et al*., 2008)**.

***Total ash (TA)***

TA content differed significantly (p<0.001) among the feed samples. The average Ash content of broiler starter feed estimated in this study was 6.2% (Table 2). The maximum and minimum ash percent obtained in current study were 8.1% and 5.23%, respectively (Table 2). The result is in close agreement with earlier studies where it was 6.33% **(Vakili *et al*., 2015)**, 6.85±0.30% **(Khan *et al*., 2008)**.

***Calcium (Ca)***

Ca content differed significantly (p<0.001) among the feed samples. The average Ca content of broiler starter feed estimated in this study was 1.2% (Table 2). The maximum and minimum calcium percent obtained in current study were 3.2% and 0.7%, respectively (Table 2). The result is in close agreement with earlier studies where it was 1.05% **(Vakili *et al*., 2015)** , 1.02±0.05% **(Khan *et al*., 2008)**, 1.30± 0.14% for Aftab feed, 1.46± 0.06% for quality feed, 1.30±0. 19% for Paragon feed and 1.10 ± 0. 11% for Nourish feed (**Roy *et al*., 2004)**.

***Phosphorus (P)***

Ca content differed significantly (p<0.001) among the feed samples.The average P content of broiler starter feed estimated in this study was 0.7% (Table 2). The maximum and minimum phosphorus percent obtained in current study were 0.97% and 0.39%, respectively (Table 2). The result is in close agreement with earlier studies where it was 0.62% **(Vakili et al., 2015)**, 0.50 ± 0.10% for Aftab feed, 0.50 ± 0. 05% for Paragon feed and 0.50± 0. 06% for Nourish feed (**Roy *et al*., 2004)**.

**Table 1. Chemical composition (g/100g) of broiler starter feeds**

| Sample ID | Chemical components (g/100g) | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| DM | CP | CF | EE | Ash | Ca | P |
| 1 | - | - | 3.6 | 6 | 5.6 | 3.2 | 0.9 |
| 2 | 90.5 | 22.1 | 5 | 5.4 | 6.3 | - | - |
| 3 | - | - | - | - | - | 1.8 | 0.8 |
| 4 | 90.2 | - | 4.8 | 5.9 | 6.4 | 1.1 | 0.7 |
| 5 | - | 24.2 | - | - | - | - | - |
| 6 | - | 21.4 | - | - | - | - | - |
| 7 | 89.8 | - | - | - | - | - | - |
| 8 | - | 19.5 | - | - | - | - | - |
| 9 | - | 20.8 | - | - | - | - | - |
| 10 | 89 | - | 5.4 | 5.8 | 5.5 | 1.1 | 0.8 |
| 11 | 89.1 | - | 6.1 | 5.4 | 6.3 | 0.9 | 0.6 |
| 12 | 89.6 | - | 6 | 5.6 | 6 | 1.1 | 0.7 |
| 13 | 89.7 | - | 5.8 | 6 | 6.1 | 1.4 | 0.6 |
| 14 | 88.9 | - | 5.8 | 5.8 | 6 | 1.3 | 0.6 |
| 15 | 88.4 | - | 5.6 | 5.5 | 5.7 | 1.5 | 0.6 |
| 16 | 89.1 | - | 6.8 | 5.5 | 5.9 | 1.9 | 0.9 |
| 17 | 89 | 25.2 | - | - | 5.9 | - | - |
| 18 | 90.2 | - | 6 | 5.9 | 6 | 1.7 | 0.8 |
| 19 | 91.2 | 22 | 6.3 | 5.9 | 5.5 | 1.6 | 0.9 |
| 20 | 91.4 | 20.4 | 4.6 | 6.4 | 5.2 | 1.5 | 0.8 |
| 21 | 91 | - | 5.7 | 6 | 6.3 | 0.9 | 0.7 |
| 22 | 90.3 | - | 5.7 | 5.8 | 6.6 | 1 | 0.6 |
| 23 | 89.5 | - | 6.1 | 5.9 | 6.5 | 1.1 | 0.7 |
| 24 | 89 | - | 6.4 | 6 | 6.5 | 1 | 0.6 |
| 25 | 89.8 | - | 6.1 | 5.9 | 6.6 | 0.9 | 0.6 |
| 26 | 90 | 24.2 | 5.6 | 6 | 6.7 | 1.1 | 0.7 |
| 27 | 89 | 24.2 | 6.9 | - | 6 | 0.8 | 0.7 |
| 28 | 90 | 24.5 | 6.1 | - | 6.7 | 0.9 | 0.7 |
| 29 | 89.6 | 24.6 | 6.8 | - | 6.8 | 1 | 0.7 |
| 30 | 90.5 | 24.5 | 5.8 | - | 7 | 1 | 0.7 |
| 31 | 90.7 | 25 | 6.1 | 6.2 | 7 | 0.8 | 0.7 |
| 32 | 89.1 | 22 | 5.9 | 6.3 | 6.1 | 0.9 | 0.6 |
| 33 | 88.5 | 21 | 5.3 | 6.6 | 5.8 | 0.7 | 0.6 |
| 34 | 89.6 | 21.2 | 4.6 | 5 | 6.4 | 1 | 0.7 |
| 35 | 90.1 | 23.5 | 4.8 | 6 | 6 | 0.9 | 0.6 |
| 36 | 89.4 | 22.1 | 5.4 | 7.1 | 6.3 | 1.2 | 0.6 |
| 37 | 89.9 | 23.2 | 5.4 | 6.4 | 6.2 | 1 | 0.6 |
| 38 | 91.3 | 25.5 | 6.8 | 6.2 | 7 | 1 | 0.7 |
| 39 | 87.1 | 23 | 5 | 5.8 | 5.9 | 1 | 0.6 |
| 40 | 89.7 | 22.5 | 6 | 6.3 | 5.9 | 1 | 0.6 |
| 41 | 89.4 | 21.4 | 4.5 | 5 | 6.1 | 1 | 0.7 |
| 42 | 90.5 | 22.5 | 6.5 | 5.6 | 5.4 | 0.7 | 0.6 |
| 43 | 90.5 | 25 | 7.3 | 6.7 | 6.5 | 1 | 0.7 |
| 44 | 90.2 | 24.5 | 6.3 | 6 | 6.8 | 0.8 | 0.7 |
| 45 | 90.5 | 23.3 | 6.2 | 5.4 | 7.2 | 1.1 | 0.8 |
| 46 | 91 | 23.5 | 5.5 | 5.4 | 6.6 | - | - |
| 47 | 90.4 | 21.8 | 6.4 | 5.6 | 6.6 | - | - |
| 48 | 90.5 | 25.4 | 5.4 | 5.6 | 6.8 | 1.1 | 0.6 |
| 49 | 90.4 | 24.5 | 5 | 5.7 | 6.5 | 1.2 | 0.7 |
| 50 | 89.7 | 20.5 | 5 | 5.7 | 6.5 | 1.4 | 0.6 |
| 51 | 89.5 | 24 | 4.9 | 6.3 | 8.1 | 1.2 | 0.6 |
| 52 | 90.8 | 23 | 5.6 | 6.2 | 5.7 | 1.2 | 0.7 |
| 53 | 89.2 | 22 | 5.1 | 5 | 6.3 | 1.4 | 0.8 |
| 54 | 89.5 | 22.5 | 5.5 | 5.6 | 6.6 | 1.2 | 0.5 |
| 55 | 90.8 | 23.6 | 5.1 | 5.8 | 6.5 | - | - |
| 56 | 90.1 | 22.8 | 5.3 | 5.5 | 6.5 | - | - |
| 57 | 90.7 | 23 | 4.4 | 5.8 | 6.5 | 1.2 | 0.7 |
| 58 | 90.4 | 23 | 5.7 | 5.8 | 6.6 | 0.9 | 0.6 |
| 59 | 90.2 | 24.5 | 6.7 | 5.8 | 6.5 | 1.6 | 0.6 |
| 60 | 87.2 | 21.5 | 7.5 | 5.4 | 6 | 1.2 | 0.6 |
| 61 | 90.5 | - | 5.4 | 6 | 6.9 | 1.1 | 0.6 |
| 62 | 90.4 | 23.1 | 5.7 | 5.8 | 6.6 | 1.1 | 0.6 |
| 63 | 90.4 | - | 5 | 6.1 | 6 | 1 | 0.6 |
| 64 | 90.4 | 23.3 | 5 | 6.7 | 6.5 | 1.9 | 1 |
| 65 | 90.4 | 23.8 | 4.9 | 6.6 | 6.2 | 1.3 | 0.7 |
| 66 | 89.2 | 20.6 | 2.9 | 6.2 | 6.2 | 1.3 | 0.7 |
| 67 | 90.6 | 22.5 | 6 | 6.5 | 6.3 | 1.1 | 0.5 |
| 68 | 91 | 23 | 5.1 | 6.1 | 6.1 | 1.2 | 0.6 |
| 69 | 90.2 | 23.8 | 3.6 | 5.6 | 6.6 | 1.7 | 0.8 |
| 70 | 90.4 | 23.6 | 5.3 | 6 | 6.7 | 1 | 0.4 |
| 71 | 90.8 | 21.9 | 5 | 6.3 | 6.8 | 1 | 0.5 |
| 72 | 90.7 | 22.8 | 5.4 | 5.9 | 5.9 | 1.1 | 0.5 |
| 73 | 90.6 | 20.8 | 5.5 | 6.5 | 5.6 | 1.6 | 0.8 |
| 74 | 89 | 23.1 | 5.1 | 7.6 | 5.7 | 1 | 0.5 |
| 75 | 90.9 | 23.3 | 5.2 | 7.8 | 6.1 | 1.3 | 0.6 |
| 76 | 89.9 | 21.9 | 4.7 | 5.7 | 6.3 | 1.4 | 0.8 |
| 77 | 90.5 | 22.4 | 4.6 | 7 | 5.8 | - | - |
| 78 | - | 22.4 | 4.8 | - | - | 1.2 | 0.8 |
| 79 | 90.6 | 22.8 | 4.7 | 5.8 | 5.8 | 1.3 | 0.9 |
| 80 | 90.4 | 21.4 | 5.2 | 8.1 | 5.4 | 1.1 | 0.4 |
| 81 | 90.3 | 23.6 | 6.5 | 6.2 | 5.9 | 1.2 | 0.7 |
| 82 | 89.2 | 23.5 | 6 | 6.5 | 6 | 1.8 | 1 |
| 83 | 89.7 | 18.7 | 6.1 | 5.5 | 6.6 | 1.2 | 0.7 |
| 84 | 89.4 | 24 | 4.8 | 5.6 | 6.2 | 1.2 | 0.6 |
| 85 | 89 | 23.5 | 6 | 5.5 | 7.2 | 1.3 | 0.7 |
| 86 | 89.2 | 23.6 | 4.8 | 5.2 | 6.4 | 1.3 | 0.7 |
| 87 | 90.4 | 24 | 5.3 | 5.3 | 6.1 | 1.2 | 0.7 |
| 88 | 89.7 | 21.7 | 5.6 | 6 | 5.8 | 1 | 0.5 |
| 89 | 88.7 | 22 | 6.7 | 7.5 | 6.1 | 1.2 | 0.7 |
| 90 | 90.1 | 21.8 | 5.6 | 7 | 5.5 | 1.3 | 0.7 |
| 91 | 89.3 | 24.3 | 5 | 5.9 | 5.4 | 1.4 | 0.8 |
| 92 | 89 | - | 4.9 | 7.1 | 6 | 1.6 | 0.6 |
| 93 | 89.5 | - | 5.5 | 5.5 | 6.6 | 1.8 | 0.9 |
| 94 | 89.2 | - | 4.4 | 5.6 | 6.4 | 1.5 | 0.7 |
| 95 | 89.5 | - | 6.4 | 5.7 | 6.3 | 1.3 | 0.6 |
| 96 | 89.4 | - | 4.6 | 5.6 | 6.1 | 1.2 | 0.6 |
| 97 | 90.5 | - | 4.1 | 5.3 | 5.8 | 1.3 | 0.7 |
| 98 | 89.9 | - | 4.7 | 5.6 | 6.2 | 1.2 | 0.8 |
| 99 | 89.3 | - | 4 | 6 | 5.9 | 1.5 | 0.7 |
| 100 | 89.6 | - | 4.4 | 5 | 6 | 1.1 | 0.5 |
| 101 | 89.8 | - | 3.6 | 5.6 | 5.9 | 1.1 | 0.5 |
| 102 | 89.6 | - | 4.3 | 5.1 | 5.4 | 0.8 | 0.4 |
| 103 | 89.4 | - | 4.2 | 5.7 | 6 | 1 | 0.5 |
| 104 | 89.2 | - | 2.9 | 6.5 | 6.4 | 1 | 0.6 |

**Table 2. Statistical analysis of the chemical composition of broiler starter feeds**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameters** | **Min.** | **Max.** | **Mean** | **Median** | **Mode** | **SD** | **P value** |
| **DM** | 87.1 | 91.4 | 89.9 | 89.9 | 90.4 | 0.78 | <0.001 |
| **CP** | 18.7 | 25.5 | 22.9 | 23 | 24.5 | 1.41 | <0.001 |
| **CF** | 2.87 | 7.5 | 5.4 | 5.4 | 5 | 0.88 | <0.001 |
| **EE** | 4.95 | 8.1 | 6 | 5.85 | 6 | 0.59 | <0.001 |
| **Ash** | 5.23 | 8.1 | 6.2 | 6.2 | 6 | 0.47 | <0.001 |
| **Ca** | 0.7 | 3.2 | 1.2 | 1.2 | 1 | 0.34 | <0.001 |
| **P** | 0.39 | 0.97 | 0.7 | 0.65 | 0.63 | 0.11 | <0.001 |

**Conclusion**

Broiler starter feed is very important for broiler at the age of 0-14 days. It can enhance the growth of broiler. It contains all types of nutrients for betterment of growth of broiler. There is no doubt that, inclusion of broiler starter feed will substantially minimize cost of production for broiler. However, current study indicates that the quality of broiler starter feed is slightly variable. Therefore, to formulate least cost balanced ration, broiler starter feed must be analyzed first in the laboratory and then incorporate it into the practical ration.

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**The Author**

**Biography**

I am Sharif Ahamed, son of Hafez Ahammed and Sahida Begum. I passed Secondary School Certificate examination in 2009 (G.P.A-5.00) followed by Higher Secondary Certificate examination in 2011 (G.PA-5.00). Now I am an intern veterinarian under the Faculty of Veterinary Medicine in Chittagong Veterinary and Animal Sciences University. In the future I would like to work in the field of veterinary Epidemiology and Research.