**Chapter 1**

**INTRODUCTION**

The poultry farming has now turned into one of the most important division of agriculture throughout the world. It is expanding rapidly as a dynamic industry in South Asian countries. The tremendous role of commercial broilers is to meet the increasing demand of the population for protein by the meats and eggs. Poultry is basically a source of economical, palatable and healthy food protein ***(Mahesar et al. 2010****)*. .poultry industry is playing a vital role in the economy of the country and providing employment for the people.

Poultry feeds are known as a complete feeds, since it is prepared in such a way to contain all the vitamins, minerals, energy, protein, and other nutrients essential for proper health of the birds, egg production and growth. it is generally agreed that feed represents the major cost of the poultry production. According to **McNab(1999)** this cost lies between 65 and 75%. So, any improvement in the performance of broilers and layers due to their diet can inevitably have a profound effect on profitability. Seasonal availability of locally produced feed ingredients together with variations in quality of some ingredients have made the feed situation in Bangladesh unsatisfactory from the quality standpoint. Inadequate feed analytical services as well as lack of statutory control over feed quality have further aggravated the situation. The number of feed mills is increasing rapidly throughout the country to meet the high demand It was reported in 1999 that there were 40 feed mills with 900 dealers within the private sector that were producing and distributing poultry feed all over the country (**Latif 1999**).Few of the feed mills are serious in maintaining the quality of products.  On the other hand, farmers do not have access to adequate facilities to analyze and monitor the quality of the commercial feeds. In view of the limited availability and varying sources of different feed ingredients, the level of nutrients in the prepared feeds may differ from what is actually required. In view of the above situation, the present study was undertaken to ascertain the variations in the nutrient status of compound broiler feeds collected from two different feed mills located in Bangladesh and to compare the quality of the feeds. Different feeds give different results in terms of growth and egg production. To attain the exact quantities of nutrients, it is important to balance the ratio of diet.

**Chapter 2**

**REVIEW OF THE LITERATURE**

It is generally agreed that feed represents the major cost of the poultry production. Hence, an attempt is made here to put together some of the closely related findings about the broiler feed in general from other sources and has been reviewed in this chapter with special reference .

**Dick *et al*.,(2002)** suggested that harmonization of feed qualities can only be possible when a given standard adopted nationwide.**ogunwolere and onwuka*et al*.,(1997)** reported that a part from highest crud fiber contain in most commercial feed, the recomanded and noticeable low crud protien observed in some commercial feed and these feeds are areadulterated with sawdust, sand and maize barn. .

**Wiebe *et al.*,(2002)** stated that the recomanded level in Nigeria.the poultry industry has continued to decline as a result of low quality of feed and high feeding cost which accounted about 75% of total cost of production.

According to **McNab (1999)** poultry feed cost lies between 65 and 75%. So, any improvement in the performance of broilers and layers due to their diet can inevitably have a profound effect on profitability.

**Onwudike and Temim *et al.*,** who reported that feed efficiency was improved with increasing dietary CP levels for broiler chicks.

**Leeson et al.,** who reported improved feed efficiency with 22 and 24% CP and 3000Kcal ME/kg as compared with diets with 20% CP and 2600Kcal ME/kg.

**Ferguson *et al.,***reported an increase in FCR when CP was reduced from 21.5 to 19.6% in a six-week broiler growth trial.

**Nawaz *et al.*** reported that low-ME and high-CP diets promised optimum performance for broiler chicks at both starter and finisher

**(Falk, 1985).**A general definition of the pelleting process is “the agglomeration of small particles into larger particles by the means of a mechanical process in combination with moisture, heat, and pressure”

**(Fairfield, 1994)** pelleting improves feed handling characteristics (i.e. dustiness and flowability) and reduces the incidence of pathogenic organisms

**(Acar *et al.,* 1991;Scheideler, 1995; Moritz *et al.,* 2001).**The most commonly touted advantages to pelleting is the growth and feed efficiency improvements realized

**(Behnke, 1996).** it was thought that via steam conditioning and extrusion of the feed

through the pellet die, the integrity of the starch granules and proteins were disrupted in a manner that improved diet digestibility

**(Husser and Roblble 1962; Bolton, 1960; Sibbald, 1977).**The majority of evidence does not support any pelleting effects on protein or energy digestion

It was work **reported by Jensen (1962)** that brought forth the notion that pelleting enhances bird performance by reducing energy expenditure for prehension thereby yielding more energy available for tissue accretion.

The proportion of intact pellets presented to the bird further depends on feed delivery systems

on the trucks and within the broiler house **(Scheideler, 1995**).

**(Behnke, 1996)** In the feed mill,diet formulation, particle size of the mash, conditioning time and temperature, pellet die thickness, and cooling and drying time, contribute to pellet quality numerous nonnutritive factors, such as those related to feed processing and general husbandry that modify broiler behavior **(Skinner-Noble, 2005)**

**(Cobb Vantress, 2003)** The majority of poultry rations utilized today undergo some type of post-mixing processing, and production manuals contain many managerial-husbandry recommendations that impact BW and FCR

**Chapter 3**

**MATERIALS AND METHODS**

**Location and objectives**

##### The experiment was conducted at “Chittagong veterinary and animal sciences University”khulshi, Chittagong. The objective was to evaluate the compound broiler feeds based on, proximate analyses.

Out of different feed mills engaged in production and marketing of poultry feed in Bangladesh, two were selected randomly (Table: 1), and considered as the experimental  treatments.

**Table: 1** **Location of randomly selected feed mills**

|  |  |
| --- | --- |
| NF | Nourish Feed Limited, Gusinga, Sreepur, Gazipur |
| AF | Aftab Feed Limited, Koliachar, Bazitpur, Kishoregong |

**3.1. Collection of feed samples**

Broiler Feed samples (starter, grower, finisher) were collected from the sales and display centers of the feed mills and also from different broiler farm in Chittagong district.

**3.2. Preparation of samples**

At first the samples were collected from different sales, displaycenters and also from different broiler farm. Then the samples were grinded separately and stored in air tight plastic bags until required for analysis (***Mahesar et al. 2008***).

**3.3. Analysis of Nutrient composition of poultry feed of different companies**

The feed samples were analysed for proximate composition viz., Drymatter(DM), moisture, crude protein(CP), crude fat(EE), crude fibre(CF) and total mineral matter (ash) and expressed in percentage. Proximate analysis of these feeds was done according to the procedures described by **AOAC (1990).**

**3.3.1 Moisture**

Five grams of powdered feed sample was weighed into a previously weighed

moisture cup and dried in an oven at 60°C till a constant weight was attained (**Anon., 1990** )

Initial weight (g) – Final weight (g)

Moisture % = ------------------------------------------ × 100

Sample weight

**3.3. 2 Crude protein**

The nitrogen content of flour was estimated by Microkjeldahl method in Parnas and Wagner apparatus (Anon., 1990). The crude protein content was calculated by multiplying with factor 6.25 and expressed on per cent basis.

(Titre—Blank ) × Normality of HCL × 14.007 × 6.25

Protein % = ------------------------------------------------------------- × 100

Sample weight (g)

**3.3.3 Crude fat(EE)**

Moisture free sample was weighed in moisture free thimbles and crude fat was extracted by refluxing in soxhlet apparatus using petroleum ether as solvent. Per cent crude fat was calculated by difference (Anon., 1990).

Initial weight (g) – Weight after extraction (g)

Crude fat % = --------------------------------------------------------- × 100

Sample weight (g)

**3.3.4 Crude fibre**

Fat free seed flour sample was hydrolyzed with dilute sulphuric acid (0.255 N) and dilute alkali (0.313 N) to estimate crude fibre by employing the methods of Mayanard (1970).

Weight residue with crucible (g) – Weight of ash with crucible

Crude fibre % = -------------------------------------------------------------------- ×100

Weight of fat free sample (g)

**3.3.5 Total mineral matter**

Total mineral matter ( ash ) was determined by igniting samples in muffle furnace at 600°c for 3 - 4 hours ( Anon., 1990). The total mineral matter was expressed as per cent.

Weight of crucible with ash (g)

Total mineral matter %(ASH) = -------------------------------------------- × 100

Weight of crucible with sample (g)

**3.3.6 Metabolizable energy**

The metabolizable energy content was calculated by using the following formula (Lodhi et al, 1976).

ME=32.95(% CP + % EE \* 2.25 +% NFE) -29.20

**3.3.7 Calculation of NFE:**

The NFE content was calculated by deducting the sum of the values for moisture, crude protein, crude fat, crude fiber and total mineral matter in 100 ( Raghuramulu et al., 1983 )



Fig 2: grinded samples

Fig 1: Feed samples



Fig 3: Estimation of DM

Fig 4: Weighing of samples





Fig 5: Estimation of CP

Fig 5: Estimation of CP

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Fig 7: Estimation of CF

Fig 6: Estimation of EE

**Chapter 4**

**RESULTS**

**Table (4.1):** Proximate component of two companies feed with company standard **(starter feed)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **Aftab Feed Limited**  (AF), | | **Nourish Feed Limited**,  (NF) | |
| Company value | Observed value | Company value | Observed value |
| MOISTURE% | 11 | 10.1 | 12 | 9.2 |
| DM% | 89 | 89.8 | 88 | 90.8 |
| ME[kcal/kg] | 3000 | 2866 | 2950 | 2849 |
| CP% | 22 | 19.77 | 21 | 20.12 |
| CF% | 4.8 | 3.8 | 5 | 2.99 |
| NFE% | 51.5 | 54.83 | 61.5 | 56.89 |
| EE% | 6.5 | 5.9 | 5.5 | 4.6 |
| ASH% | 8.7 | 5.6 | 6.5 | 6.2 |

**Table (4.2):** Proximate component of two companies feed with company standard **(grower feed)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **Aftab Feed Limited**  (AF), | | **Nourish Feed Limited,**  (NF) | |
| Company value | Observed value | Company value | Observed value |
| MOISTURE% | 11 | 10.2 | 12 | 9.6 |
| DM% | 89 | 89.8 | 88 | 90.4 |
| ME[kcal/kg] | 3050 | 2825 | 3000 | 2873 |
| CP% | 19.5 | 18.38 | 20 | 19.77 |
| CF% | 5 | 4.8 | 5 | 4.6 |
| NFE% | 52.2 | 54.52 | 55.5 | 53.03 |
| EE% | 7 | 6.1 | 7.5 | 6.8 |
| ASH% | 6.5 | 6 | 6.3 | 6.2 |

**Table (4.3):** Proximate component of two companies feed with company standard **(finisher feeds)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **Aftab Feed Limited**  (AF), | | **Nourish Feed Limited,**  (NF) | |
| Company value | Observed value | Company value | Observed value |
| MOISTURE% | 11 | 10.4 | 12 | 10 |
| DM% | 89 | 89.6 | 88 | 90 |
| ME[kcal/kg] | 3100 | 2856 | 3050 | 2877 |
| CP% | 18.5 | 17.3 | 19 | 18.34 |
| CF% | 5 | 4.9 | 5 | 4.3 |
| NFE% | 55 | 54.3 | 60.5 | 53.46 |
| EE% | 7.5 | 7.1 | 7.40 | 7.3 |
| ASH% | 6 | 6 | 6.3 | 6.6 |

**Chapter 5**

**DISCUSSIONS**

From the above observation (table 4.1, 4.2, 4.3) it can be said that, moisture,CP,ME, CF,EE, ASH content of **aftab starter feed** were 10.1, 19.77, 2866, 3.8, 5.9, 5.6 respectively. which were slightly lower than the company value 11, 22, 3000, 4.8, 6.5, 8.7 and these value disagree with **B C Roy *et al.,*(2004).**they observed moisture ,CP,ME, CF,EE ,ASH content of aftab starter feed were 10.3­, 23.9, 3093, 4.7, 6.7, 8.7 respectively.DM content was 89.8 which was almost similar to the company DM value 89 this value agrees with **B C Roy *et al.,*(2004).** they observed DM value of aftab starter feed was 89.7 but the NFE content was 54.83 which was slightly higher than the company NFE value 51.5 this value disagrees with **B C Roy *et al.,*(2004** they observed NFE value of aftab starter feed was 55.8

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Moisture, CP, ME, CF, EE, content of **aftab** **Grower feed were** 10.2, 18.38, 2825, 4.8, 6.1, respectively. which were slightly lower than the company value11, 19.5 ,3050, 5, 7, these value disagree wth **B C Roy *et al.,*(2004).**they observed moisture ,CP,ME, CF,EE content of aftab grower feed were 10.6, 21, 3188, 5.20, 7.8, respectively.DM,& ASH content were 89.8, 6 respectively which were almost similar to the company DM & ASH value 89, 6.5 these value agree with **B C Roy *et al.,*(2004).** they observed DM & ASH value of aftab grower feed was 89.4, 6.8 but the NFE content was 54.52 which was slightly higher than the company NFE value 52.2 this value disagrees with **B C Roy *et al.,*(2004** they observed NFE value of aftab grower feed was 59.1 .

Moisture ,CP,ME, CF,EE,NFE content of **aftab Finisher feed** were 10.4, 17.3, 2856,4.9,7.1 ,54.3 respectively. Which were slightly lower than the company value 11, 18.5, 3100, 5, 7.5 ,54.3 these value disagree with **B C Roy *et al.,*(2004).**they observed moisture ,CP,ME, CF,EE,NFE content of aftab starter feed were 10.6, 20.2, 3080, 4.8, 8, 60.6 respectively DM,& ASH content were 89.6, 6 respectively which were almost similar to the company DM& ASH value 89, 6 these value agree with **B C Roy *et al.,*(2004).** They observed DM& ASH value of aftab finisher feed was 89.4, 6.

Moisture ,CP,ME, CF,NFE ,EE content of **Nourish starter feed** were 9.2, 20.12, 2849,2.99, 56.89,4.6, respectively. which were slightly lower than the company value 12, 21, 2950, 5, 61.5, 5.5 these value disagree with **B C Roy *et al.,*(2004).**they observed moisture ,CP,ME, CF,NFE content of **nourish** starter feed were 10,22.9, 3148, 3.5, 61.4, 5.5 respectively ASH content was 6. 2 which was almost similar to the company ash value 6.5 this value agree with **B C Roy *et al.,*(2004).** They observed ASH value 6.5. DM observed value of nourish starter feed was 90.8 which were slightly higher than the company value 88. This value disagree with **B C Roy *et al.,*(2004** they observed DM value of nourish starter feed was 90.

Moisture, CP,ME, CF,NFE ,EE content of **Nourish grower feed** were 9.6, 19.77,2873,4.6, 53.03, 6.8 respectively. which were slightly lower than the company value 12, 20, 3000, 5, 55.5, 7.5 these value disagree with **B C Roy *et al.,*(2004).**they observed moisture ,CP,ME, CF,NFE ,EE content of **nourish grower** feed were 10.6, 22.6, 3177, 5.3, 58.3,7.30 respectively. ASH content was 6.2 which was almost similar to the company ash value 6.3 this value agree with **B C Roy *et al.,*(2004).** They observed ASH content of **nourish grower** feed was 6.3. DM value of nourish grower feed was 90.4 which were slightly higher than the company DM value 88 .This value disagree with **B C Roy *et al.,*(2004)** they observed DM value of nourish grower feed was 90.4.

Moisture, CP, ME, CF,NFE content of **Nourish finisher feed** were 10,18.34, 2877, 4.3, 53.46, respectively. which were slightly lower than the company value 12,19, 3050, 5, 60.5 these value disagree with **B C Roy *et al.,*(2004).**they observed moisture ,CP,ME, CF,NFE content of **nourish finisher** feed were 9.6, 20.6, 3208, 4.5, 61.00 respectively ASH& EE content were 6.6, 7.3 which was almost similar to the company ASH &EE value 6.3, 7.40 this value agree with **B C Roy *et al.,*(2004).** They observed ASH& EE value of nourish starter feed were 6.3, 7.4 but the DM content was 90 which was slightly higher than the company DM value 88 this value disagree with **B C Roy *et al.,*(2004** they observed DM value of nourish starter feed was 90.4.

ME, CP, value of both aftab & nourish feed also disagree with **NRC(19994)** standard whereas they reported that starter should contain ME%3000,CP%22 .Grower should contain ME%3100,CP%21.finisher should contain ME%3200,CP%20.

These variation of nutrient content of aftab & nourish feed occurred due to environmental or experimental variation.

**Chapter 6**

**CONCLUSION**

The data included in the study represented the variations among the quality of the poultry feeds broiler (starter, grower, finisher) from selected manufactures which was somewhat slightly differed from NRC (1994) recommendations and also from their company standard. Each manufactures has its own formulation which doesn’t remain constant throughout the whole year but changes according to the feasibility of the constituents of the poultry feed. The existing information about the composition and nutritive value of the poultry feed permits the poultry farmers to select the better choice of feed and it’s ration for the better growth and health of the poultry on the basis of cost, palatability and energy. All company should supply proper nutrient during feed formulation to fulfill nutrient requirement of poultry.

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**Chapter 7**

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