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Physical & Chemical Composition Nutritional Evaluation and Efficiency Tests of Broiler on Various Types of Diets

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Abstract – Poultry meat and eggs are a great source of vitamins & micro nutrients that add to human diet as a valuable portion. it is an attempt to study the physical and chemical evaluation of poultry rations mainly different physical forms of compounded feeds and to study the chemical composition of poultry rations. Broiler meat has a greater market relative to other foods, mainly due to the disadvantages of beef and pork, and religious uses. This also holds the highest acceptability of all customer pieces. The excess feeding is transformed into food; encouraging broiler chickens to provide an infinite supply of feed would contribute to the need to consume excess poultry. The manufacture of lean poultry meat to satisfy consumer demands is thus a big industry priority.

Key Words – Broiler Feed Strategy, Poultry, Nutrients, Physical & Chemical Composition

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INTRODUCTION

In India the poultry sector is leading to GNP 100 billion rupees. The estimated accessibility of 1 kg of meat per household in India is less than 10.8 kg of meat recommend by the National Committee for Human Nutrition (Evans, 2002). In the meat market, however, the business has the capacity to expand by around 10 times. Broiler meat has a greater market relative to other foods, mainly due to the disadvantages of beef and pork, and religious uses. This also holds the highest acceptability of all customer pieces. The excess feeding is transformed into food; encouraging broiler chickens to provide an infinite supply of feed would contribute to the need to consume excess poultry. In recent decades the excess body fat deposition has been of concern to both producers & consumers. The above deliberation is imperative as the results of such human survey has associated high consumption of dietary fat to occurrence of cardiovascular disease. Besides being ineffective in regards to energy production & overall intake of feed (Pasternak 1983), high deposition of body fat in broiler chickens also represents economic loss for farmers. The manufacture of lean poultry meat to satisfy consumer demands is thus a big industry priority. That stimulated interest in rising deposition of abdominal fat in broilers. The broilers' growth rate is known as the most significant economic feature in the broiler industry. Unfortunately this pace of development is followed by elevated accumulation of body fat, high obesity and an growing prevalence of cardiovascular illness & skeletal disorders. To resolve both of these, broilers can subject to limits on feeding during the early life process, accompanied by regular eating. This low demand was retained during re-feeding, and if development continued at a reasonable or above average pace, the feed output would be dramatically increased, contributing to an economic benefit.

BROILER FEED STRETEGY

In broiler industry, feed constitutes 60-70% of the total cost. The exorbitant feed cost of conventional feed ingredients has necessitated to formulate efficient and cost effective broiler ration. Now the attention of the scientists is towards the utilization of agricultural by-products like rice bran, wheat bran and sunflower cake. Food production in the Nation's indeed the world's largest business and more than two third of the people of developing countries are directly involved in food production. The world wide per capita food situation is worsening because death rates are decreasing, birth rates remain high and crop yields continue to be constant. If the world food population crisis is to be resolved out the protein gap closed, efforts and resources be brought to commensurate with the importance and urgency of the situation. Efforts to meat world food deficits should not overlook the

need for development of a balance agriculture economy in the country. Animal production is important to maximal effective use of available natural resources and broiler production is one of them, which requires less land, labour and capital to start with.

OBJECTIVE OF THE STUDY

1. The availability and market share of Commercial Compounded Feeds.
2. The physical &chemical composition of poultry ration.
3. Three types of rations, viz. organized ration with conventional ingredients

RESEARCH METHODOLOGY

The research on the physical and chemical evaluation of poultry rations mainly different physical forms of compounded feeds and to study the chemical composition of poultry rations. The main objective of this study is to prepare a mash broiler feed with the accessible conventional ingredients & evaluate three types of diets, viz. prepared feed with two commercially available high quality compounded feed as demanded by the companies after proper evaluation, conducting bioassay to determine the efficiency and suitability of the feed from the farmers perspective. The key technique of this research was evaluation of participants as a way to collect knowledge. Data analysis approaches qualitative & quantitative. The study involved evaluation, &document analysis. Evaluation was provided to in-depth interview with marketing manager, development heads of feed manufacturing units & satellite hatcheries, numerous poultry producers, dealers of different area. The research also acted as references for past & current industry patterns & preliminary assessment of the existing broiler sector.

PHYSICAL AND CHEMICAL COMPOSITION OF POULTRY FEEDS:

► Physical Characteristics of different commercial compounded feeds:

Visual observation was performed to assess the physical quality of the combined feeds. The mainly different forms of feeds were analyzed in the physical characteristics and color, particle size, texture, flavor, odour, contact, foreign particles, mold & fungus were also ascertained during feed processing. To assess the consistency of available commercial compounded feeds, examination of various physical types & other chemical constituents was conducted.

Various feed Form: Feed is produced & consumed all over the world in mash, pellet & crumble forms (Shete, 2001).

Mash feed: Mash feed is usually in the form of coarse powder. Mash feed production is a relatively easy process & contains the following phases:

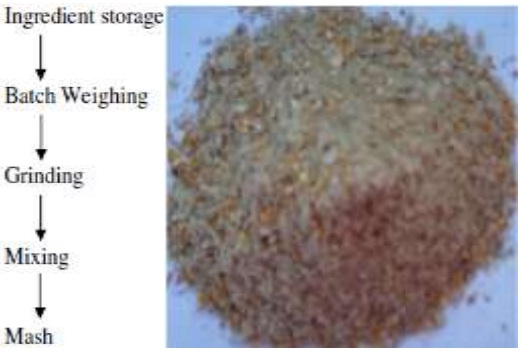


Fig.1.1 : Mash feed.

Pellet feed: Pellet feed for poultry is in the pattern of 3 mm & 5 mm diameter pellets. The method would be as follows:

Fig.1.2 : Pellet feed.

Crumble Feed : The pellet are often "crumbled" to decrease particle size to feed poultry in chick point. The crumble could be a whole pellet into smaller portions. Very young chicks can never pick up & eat a whole pellets due to it sheer size. It is also not desirable to produce very small diameter pellet due to the extreme economics of production costs. Then, a 4 mm diameter pellet is developed & crumbled. In a crumbier, pellets are moved through a pair of plates, spread at a certain interval and going in opposite directions:

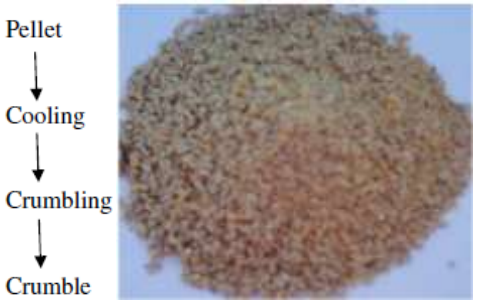


Fig.1.3 : Crumble feed.

► **Chemical Composition of different commercial compounded feed :**

Before the feeding trial was performed around one hundred compound feeds, samples were collected from the feed mill selling & show center mainly from the Assam district of Jorhat, Golaghat, Sonitpur & Kamrup (urban), & from the popular feed industry. Atleast 3 samples is collected uniformly from each organization & combined samples used for study. The compounded feed samples collected were analyzed for the content of dry matter (DM), crude protein (CP), crude fat (F), crude fiber (CF) and total ash (TA) as per the AOAC (2005) protocol. To assess the consistency of usable commercial compound feeds, examination of some chemical constituents was ascertained and provided for pre-starter, pre-starter and finisher feed in Table 1.3 and Table 1.4, respectively. Feed sample analysis was done at the Department of Animal Nutrition, Veterinary Science College, Assam Agricultural University, Khanapara, Guwahati & NRC on Yak, (ICAR), Dirang, Arunachal Pradesh.

► **Physical & Chemical composition of the prepared rations :**

Calculation was produced of the percentage of crude protein (CP) & metabolizable energy (ME kcal / kg) content of prepared feed utilized for the experiment. A control feed (E1- mash type) from traditional feed ingredients was formulated for the test for three separate stages : pre-starter, start & finisher. The pre-starter feed 's physical (parts/100 kg of feed) & chemical composition are described in Table 1.5 The physical (parts/100 kg of feed)& chemical composition of the start feed are reported in Table 1.6. The physical (parts/100 kg of feed) & chemical composition of the feed intake ration was also measured and described in Table 1.7 Chemical composition of the test feeds (E1-Prepared feed, E2-Amrit feed & E3-Godrej feed) were also computed & have represented in table 1.8.

Fig. 1.4 : Preparation of broiler Mash feed E1.

► **Analysis of Feed Toxicity:**

ELISA approach checked feed toxicity of three experimental rations primarily for Aflatoxin for three stages pre-starter, start & finisher feeds together with feed ingredients utilized for prepared feed. The calculation was carried out at the Provincial Feed Testing Laboratory, Govt. Of Assam, of Khanapara &Guwahati. Three experimental rations (E1, E2 & E3) & feed ingredients used for the formulation of the experimental ration (E1) were shown to be free of afflation in the current trial (Table 1.9).

EXPERIMENTAL FINDINGS

► **Availability & market share of commercial compounded feed:**

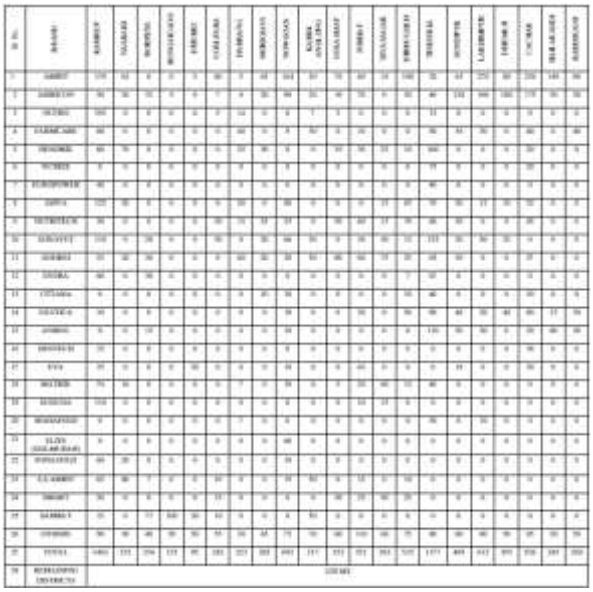
In the present research, the supply of different commercial blended feeds & their market share in North-East India was being analyzed and provided in Table 1.1. The investigation was carried during the 2009-10 year. It was observed that almost 30 numbers of branded commercial compounded feeds are available in North-East India. The total availability of these commercial compounded feeds were evaluated during the year 2009-10 and found almost 18,916 MT per month. Compared to the other North-Eastern states Assam creats the highest demand of compounded feeds with its maximum use which was 11189 MT followed by Tripura (3115 MT), Manipur (2010 MT), Mizoram (1135 MT), Nagaland (720 MT), Meghalaya (440 MT) and Arunachal Pradesh (307 MT). Market share of Amrit feed was the highest, which was almost 3365 MT per month. There were also some local and other compounded feeds which contributed almost 2549 MT as described as “others” in the Table1.1.

District wise market share of available compounded commercial feeds for twenty one district of Assam has been depicted in Table 1.2. It was found that the Kamrup district (Metro & Rural) had the maximum demand of compounded feed which was almost 1463 MT per month during the year 2009-10 followed by Tinsukia (1177 MT per month) and Cachar (926 MT per month). Out of the almost twenty five commercial compounded feeds available in the 21 districts of Assam, market share of the Amrit feed was the highest (Avg. 1728MT per month) and the market share of the Godrej feed was in the fifth position (605 MT per month). In respect of remaining six districts of Assam the availability of commercial compounded feeds of all brands was almost 1287 MT per month. It is observed from the market and personal communication that the average requirement of commercial compounded feed in Assam is almost 20,000MT per month during the year 2012-2013.

Table 1.1: Market Share of Commercial Compounded Feed in North-East India Per month during 2009-10

Sl. No.	BRAND	ASSAM	TRIPURA	MANIPUR	MIZORAM	ARUNACHAL	MEGHALAYA	NAGALAND	TOTAL (MT)
1.	AMRIT	1720	400	620	167	60	100	100	3167
2.	AMRICON	1092	60	200	41	100	0	20	1493
3.	NUTRO	1408	49	300	37	35	150	17	1996
4.	FARMCARE	765	18	100	8	7	0	10	907
5.	HINDRO	500	319	0	0	0	0	0	819
6.	NUTREX	93	138	0	0	0	0	0	231
7.	EUROPOWER	80	0	0	0	0	0	0	80
8.	JAPFA	489	255	0	20	0	0	0	764
9.	NUTRITECH	295	170	0	36	0	0	25	725
10.	SONAVET	500	200	80	36	12	15	0	972
11.	GODREJ	605	68	0	45	0	10	0	728
12.	ENTRA	134	0	0	0	0	0	0	134
13.	UTTARA	150	81	0	50	0	0	20	281
14.	EXOTICA	423	200	0	180	10	0	0	813
15.	ANMOL	318	60	0	0	0	0	10	388
16.	HINTECH	36	36	0	0	0	0	10	82
17.	EVA	168	27	0	200	0	0	10	405
18.	MATRIX	267	115	0	0	0	0	0	382
19.	SUGUNA	135	0	0	0	0	0	0	135
20.	MAHAFEED	47	0	0	0	0	0	0	47
21.	ELITE (GOLDMEDIUM)	60	36	0	0	0	0	0	96
22.	SONAGOLD	80	0	0	0	0	0	0	80
23.	S.S.AMRIT	252	45	0	10	0	0	20	375
24.	SMART	220	0	0	0	0	0	20	240
25.	SAMRAT	222	0	470	125	20	0	0	837
26.	PREMIER	0	0	0	0	0	40	0	40
27.	ROYAL	0	0	0	41	0	0	0	41
28.	KARISMA	0	72	0	0	0	0	0	72
29.	PARAS	0	106	0	0	0	0	0	106
30.	CHARIOT	0	45	0	0	0	0	0	45
31.	OTHERS	1245	426	210	130	45	35	430	2540
32.	TOTAL	**11189**	**3115**	**2010**	**1138**	**307**	**440**	**720**	**18916**

Table 1.2: District wise availability and market Share of commercial compounded feed (MT) per month (average) in Assam during 2009-2010



PHYSICAL AND CHEMICAL COMPOSITION OF POULTRY FEEDS:

Physical Characteristics of various commercial compounded feeds: Visual inspection was conducted to determine the physical consistency of the combined feeds. The mostly specific types of feed such as color, particle size, shape, smell, odour, foreign particles, mold and fungus were examined and considered to be natural with no unusual features detected during the analysis of industrial compound feeds. To assess the physical consistency of the available commercial compound feeds, various physical types were analyzed and crumbled & mashed in pre-starter and start feed while more pellet & mash type were reported in the finisher feed (Table-1.3 for prestarter, starter &Table-1.4, respectively, for finisher feed). In the present analysis, out of the total 27 numbers of pre-starter and start feed samples samples obtained, there were 17 numbers of crumble &10 numbers of mash type f feed samples & were regarded for evaluation. At the other hand, out of the total 20 finisher feed samples obtained for evaluation, 10 pellet numbers, 7 mash numbers & 3 crumble test sample numbers were identified and rated for evaluation.

Chemical composition of unusual commercial compounded feed : During the evaluation of chemical constituents of the commercial compounded feed, the dry matter (DM%) was in between 90.11 to 90.88 , the crude protein (CP%) at 18.58 to 23.78, while the crude fat (F%) was recorded in between 1.82 to 3.95 in the pre-starter feeds. On the other hand, the dry matter (DM%) was in between 87.61 to 90.88 , the crude protein (CP%) at 14.58 to 23.25 and the crude fat (F%) was recorded in between 1.7 to 5.5 in the starter feeds. The dry matter (DM%) for the commercial compounded feed was at 88.45 to 91.30 and the crude protein(CP%) at12.55 to 21.91, while the crude fat (F%) was recorded in between 1.15 to 4.56 in the finisher feed. The quality of Godrej feed in respect of crude protein percentage was higher i.e. at 23.78% for pre-starter, 22.86% for starter and 21.91% for finisher feed respectively. Evaluation of certain chemical constituents of different commercial Pre-starter, Starter & Finisher compounded feed has depicted in Table 1.3 & Table 1.4 respectively.

Table 1.3: Evaluation of physical & chemical constituents of unusual commercial compounded feed (Pre-starter & Starter)

Sl. No.	Sample Name	Physical Form	Dry Matter (%)	Crude Protein (%)	Crude Fat (%)	Crude Fibre (%)	Total Ash (%)
1	Godrej Pre-Starter- A	Crumble	90.78	19.44	3.54	4.71	5.80
2	Godrej Pre-Starter –B	Crumble	90.98	23.78	1.82	4.21	5.82
3	Amrit Pre-Starter –A	Crumble	91.12	19.58	2.20	4.67	6.21
4	Amrit Pre-Starter –B	Crumble	91.67	23.54	1.84	4.42	5.75
5	Amrit Pre-Starter –C	Crumble	90.11	19.44	2.04	4.85	5.78
6	Amrit pre-Starter –D	Mash	90.35	18.58	3.05	4.80	5.95
7	Sona Pre-Starter –A	Mash	91.31	22.20	3.59	5.09	6.34
8	Sona Pre-Starter –B	Mash	90.23	19.44	3.54	4.75	7.02
9	Americon pre- Starter	Crumble	91.87	22.1	3.83	5.09	6.05
10	Hundrich Starter	Crumble	90.91	22.78	2.85	4.85	5.85
11	Godrej Starter –A	Crumble	90.92	23.25	2.20	4.35	5.95
12	Godrej Starter –B	Crumble	90.55	22.86	1.7	4.62	6.01
13	Amrit Starter–A	Crumble	90.32	19.56	3.25	4.78	6.35
14	Amrit Starter –B	Crumble	90.55	22.78	1.80	4.80	5.85
15	Amrit Starter-C	Mash	90.45	14.56	3.65	4.85	6.87
16	Sona Starter –A	Crumble	90.41	21.6	3.48	4.65	5.71
17	Sona Starter –B	Mash	90.11	19.44	3.65	4.86	5.98
18	Sona Starter –C	Mash	89.25	14.58	3.55	4.95	6.02
19	Sona Starter –D	Crumble	87.61	21.70	4.98	5.17	5.94
20	Hundrich Developex	Crumble	90.88	20.45	2.95	5.14	5.78
21	Matrix Starter	Crumble	90.21	20.20	3.50	5.25	5.80
22	Samrat Starter	Mash	91.19	21.30	3.72	5.89	6.34
23	Americon Starter	Crumble	90.36	21.8	3.76	6.14	7.88
24	Nourjitas Starter	Crumble	88.79	22.30	3.73	5.56	6.40
25	CVSePoultryFarm- Starter	Mash	90.5	20.49	4.75	4.67	9.00
26	Dipha Grow Farm -Starter	Mash	90.22	22.15	5.5	6.2	9.2
27	Private farm – Starter	Mash	88.5	15.12	2.13	6.38	5.6

A, B, C, D-Different sources/type/grade of same feed

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Table 1.4 : Evaluation of physical & chemical constituents of unusual commercial compounded feed (Finisher Feed)

Sl. No.	Sample Name	Physical Form	Dry Matter (%)	Crude Protein (%)	Crude Fat (%)	Crude Fibre (%)	Total Ash (%)
1	Godrej Finisher -A	Pellet	90.30	19.44	3.96	4.85	6.20
2	Godrej Finisher -B	Pellet	90.10	21.91	2.00	4.83	6.02
3	Amrit Finisher -A	Pellet	90.45	19.34	4.01	4.89	6.35
4	Amrit Finisher -B	Pellet	90.15	19.44	3.98	5.02	6.15
5	Amrit Finisher -C	Pellet	90.25	21.42	2.00	5.23	6.25
6	Samrat Finisher	Mash	90.01	19.60	3.90	5.81	6.46
7	Harshvih Finisher	Pellet	90.20	19.45	3.98	4.86	6.28
8	Sona Finisher -A	Mash	90.15	19.44	3.78	4.95	6.66
9	Sona Finisher -B	Mash	90.01	19.60	3.90	5.81	6.46
10	Sona Finisher -C	Mash	89.86	15.58	3.18	5.25	7.04
11	Sona Finisher	Crumble	90.57	19.6	3.75	6.12	6.86
12	Sona Finisher	Pellet	90.54	20.10	4.56	5.97	6.82
13	Modern Finisher	Crumble	89.90	19.45	3.75	5.38	6.15
14	Nutri plus Finisher	Pellet	91.30	20.30	4.09	6.02	7.29
15	Amricon Finisher	Pellet	90.20	20.20	3.19	6.09	7.17
16	Amricon Finisher	Crumble	90.53	20.20	4.06	4.95	6.25
17	Matrix Finisher	Pellet	90.01	19.45	3.92	4.82	6.75
18	CVSC Poultry Farm -Finisher	Mash	90.04	17.09	1.15	4.38	7.42
19	Dipha Govt. Farm - Finisher	Mash	88.45	12.55	1.45	6.08	4.02
20	Private Farm Finisher	Mash	89.08	15.56	2.04	5.65	6.02

A, B, C, D-Different sources/type/grade of same feed

Physical & Chemical Composition of prepared Poultry Rations:

Feed (E1-Mash type) was prepared from the conventional feed ingredients for three different stages (i) pre-starter, (ii) starter (iii) finisher for the testing. The Physical & chemical composition of the pre-starter feed has presented in Table 1.5Maize was considered as the main energy source, provided 50 Parts per 100 kg in pre-starter ration. Ground nut cake (15 parts), soyabean meal (26 parts) and fish meal (5 parts) were considered as protein source and oyster shell grit (1 parts), di- calcium phosphate (1.1 parts) as calcium and phosphorus source were added. Lysine, methionine, trace mineral mixture (Agrimin forte), choline chloride, liver tonic (livol), toxin binder (Bio-Band), coccidiostat (Juricox) and probiotic (Gallipro) in specific quantities as mentioned in the Table 4.2.3.1 were incorporated. Total calculated ME in the pre-starter ration was 3152 k cal and the protein percentage was 23.1 % respectively.

Table 4.2.3.1: Physical & Chemical composition of Pre-Starter Feed

Ingredients	Parts/100 Kg	ME kcal/Kg	ME (kcal)*	CP %	CP %*
Maize	50	3430	1715	8.7	4.4
Ground nut cake	15	2790	419	39.5	5.9
Soyabean meal	26	3510	913	41.7	10.8
Fish Meal	5	2100	105	40	2.0
Oystershell Grit	1	0	0	0	0
Dicalcium Phosphate	1.1	0	0	0	0
Methionine	0.25	0	0	0	0
Lysin	0.2	0	0	0	0
Trace Mineral (Agrimin forte)	0.5	0	0	0	0
Salt	0.25	0	0	0	0
Probiotic (Gallipro)	0.01	0	0	0	0
Choline chloride	0.1	0	0	0	0
Liver tonic (Livol pfs)	0.5	0	0	0	0
Toxinbinder(Bio-Band)	0.1	0	0	0	0
Coccidiostate (Juricox)	0.05	0	0	0	0
Total			3152		23.1

*calculated ME-Metabolizable energy, CP- crude protein

Table 1.6: Physical & Chemical composition of Starter Feed

Ingredients	Parts/100 Kg	ME kcal/Kg	ME(kcal)*	CP %	CP%*
Maize	51	3430	1749	8.7	4.4
Ground nut cake	16	2790	446	39.5	6.32
Soyabean	24	3510	842	41.7	10
Fish Meal	5	2100	105	40	2.0
Oystershell Grit	1	0	0	0	0
Dicalcium Phosphate	1.1	0	0	0	0
Methionine	0.25	0	0	0	0
Lysin	0.2	0	0	0	0
Trace Mineral(Agrimin forte)	0.5	0	0	0	0
Salt	0.25	0	0	0	0
Probiotic (Gallipro)	0.01	0	0	0	0
Choline chloride	0.1	0	0	0	0
Liver tonic (Livol pfs)	0.5	0	0	0	0
Toxinbinder(Bio-Band)	0.1	0	0	0	0
Coccidiostate (Juricox)	0.05	0	0	0	0
Total			3142		22.72

*calculated, ME-Metabolizable energy, CP- crude protein

Maize was considered as main energy source, provided 51 parts per 100 kg in starter ration. Ground nut cake (16 parts), soybean meal (24 parts) and fish meal (5 parts) were considered as Protein source and oyster shell grit (1 parts), di calcium phosphate (1.1 parts) as calcium and phosphorus source were added. Lysine, methionine, trace mineral mixture (Agrimin forte), choline chloride, liver tonic (livol), toxin binder (Bio-Band), coccidiostat (Juricox) and probiotic (Gallipro) in specific quantities as mentioned in the Table 1.6 were incorporated. Total calculated ME in the starter feed was 3142 kcal and protein percentage was 22.72% respectively.

Table 1.7: Physical and Chemical composition of Finisher Feed

Ingredients	Parts/100kg	ME kcal/kg	ME(kcal)%	CP %	CP%
Maize	55	3430	1887	8.7	4.8
Ground nut cake	15	2790	419	39.5	5.9
Soyabean meal	21	3510	737	41.7	8.8
Deoiled Ricebran	5	2100	105	12.9	0.6
Oystershell Grit	1	0	0	0	0
Dicalcium Phosphate	1.1	0	0	0	0
Methionine	0.25	0	0	0	0
Lysine	0.2	0	0	0	0
Trace mineral(Agrimin forte)	0.25	0	0	0	0
Salt	0.5	0	0	0	0
Choline chloride	0.1	0	0	0	0
Liver tonic (Livol pfs)	0.5	0	0	0	0
Toxinbinder(Bio-Band)	0.05	0	0	0	0
Coccidiostate (Juricox)	0.05	0	0	0	0
Total			3148		20.10

*calculated, ME-Metabolizable energy, CP- crude protein

The finisher ration was provided maize 55 parts per 100kg alongwith deoiled rice bran (5 parts), ground nut cake (15 parts), soyabean meal (21 parts) were considered as protein source and others in specific quantities as mentioned in the Table 1.7 Total

calculated ME in the finisher feed was 3148 kcal and protein percentage was 20.10 % respectively.

► Estimated chemical composition of experimental rations :

Chemical composition of the experimental feeds were evaluated and have been presented in Table 1.8

Table 1.8: Estimated Chemical composition of experimental rations

Nutrient %	Experimental ration								
	E_1 (mash)			E2(crumble-pellet)			E3(crumble-pellet)		
	Pre Starter	Starter	Finisher	Pre Starter crumble	Starter crumble	Finisher pellet	Pre Starter crumble	Starter crumble	Finisher pellet
Crude protein (%)	21.87	20.77	19.29	23.54	22.78	21.42	23.78	22.86	21.91
Crude fat (%)	2.04	2.03	2.32	1.84	1.8	2	1.82	1.7	2
Crude fiber (%)	5.83	5.92	6.1	4.42	4.8	5.21	4.21	4.62	4.83

E_1-Prepared Feed, E_2-Amrit Feed, E_3-Godrej Feed

Chicken received Pre-starter (0-1wk), Starter (1-4wks), Finisher (4-6wks)

The estimated crude protein (CP) percentage was higher in E3 ration i.e. in Godrej feed. It was 23.78% in per-starter crumble, 22.86% in starter crumble and 21.91% in finisher pellet followed by Amrit feed 23.54% in pre-starter crumble, 22.78% in starter crumble and 21.42% in finisher pellet (Table 1.8). The estimated chemical composition of the arranged feed in respect of crude protein (CP) percentage as depicted in Table 1.8 was slightly lower than the calculated percentage as mentioned in Table4.2.3.1, Table1.6 and Table1.7Crude protein (CP) percentage was estimated as 21.87% against calculated 23.10% for pre-starter, 20.77% against calculated 22.72% for starter and 19.29% against 20% for finisher feed respectively. Though crude fat percentage in three stages were slightly higher in the E1(mash) feed i.e. in pre-starter (2.04%), starter (2.03%) and finisher (2.32%) against E2 (Crumble-pellet Amrit feed) i.e. 1.84% for pre-starter, 1.8 % for starter and 2% for finisher feed and E3 (Crumble-pellet Godrej feed) i.e. 1.82% for pre-starter, 1.7% for starter and 2% for finisher feed respectively yet crude fibre content was higher in the prepared feed (E1) which was 5.83% for pre-starter, 5.92% for starter and 6.1% for finisher period. The crude fibre percentage in feed (E2) was 4.42% for pre-starter, 4.8% for starter and 5.21% for finisher and in feed (E3) was 4.21% for pre-starter,4.62% for starter and 4.83% for finisher period.

► Determination of Aflatoxin in Different Feed Ingredients and Commercial Compounded Feed

The percentage of Mycotoxin mainly Aflatoxin in feed ingredients and compounded feeds was analyzed and the result has represented in Table 1.9

Qualitatively negative results for Aflatoxin was observed after conducting ELISA test to all samples.

Table 1.9: Analytical report of Aflatoxin in different feed ingredients and commercial feeds

Sl. No.	Sample Name	Qualitative Result	Quantitative Result	Aflatoxin Content (ppb)
1	Feed E_1 (pre-starer)	-ve	NIL	----
2	Feed E_1 (starer)	-ve	NIL	----
3	Feed E_1(finisher)	-ve	NIL	----
4	Amrit feed(pre-starter)	-ve	NIL	----
5	Amrit feed(starter)	-ve	NIL	----
6	Amrit(finisher)	-ve	NIL	----
7	Godrej (pre-starter)	-ve	NIL	----
8	Godrej (starter)	-ve	NIL	----
9	Godrej (finisher)	-ve	NIL	----
10	Maize	-ve	NIL	----
11	Ground nut cake	-ve	NIL	----
12	Soyabean meal	-ve	NIL	----
13	Deoiled rice bran	-ve	NIL	----

CONCLUSION

India has one of the world's largest and fastest growing poultry industries. The present study revealed that most of the commercial compounded feeds available in Assam were in crumble form for pre starter & starter stages and in pellet form for finisher period. At present the marketing of mash feed from compounded feed manufacturing companies is very less or almost nil in respect of broiler feed. The mean final body weight of broilers fed with crumble-pellet Godrej feed (group E3) was significantly higher followed by broilers fed with crumble-pellet (Amrit group E2) and prepared mash feed (group E1) fed group. The higher body weight could be achieved due to adequate energy and protein in the diet as well their availability for the growth. The variation in nutritional value and availability of nutrients of conventional poultry feed ingredients due to different agricultural circumstances under which these ingredients were produced and processed might be one reason of the lower nutrients values. The continued expansion of integrated production and availability of low priced domestic or imported feeds are likely to be critical to the future growth of industry, as well as to its international competitiveness.

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