**CHAPTER I**

**Introduction**

In Bangladesh, there are two types of broiler farming of which contract broiler farming is still under trial while independent small-scale broiler farming is dominant and performed for the development of broiler sector (Islam et al. 2010). 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, 2006).

 The common problems faced by the broiler grower's are procurement of broiler chicks, quality feed, appropriate litter materials and limited technical knowledge on rearing. Generally, rice husk and sawdust are used as litter in both rural and urban areas for broiler farming. Besides rice husk and sawdust, chopped straw, sugarcane pulp, paper mill by products, wood savings, sand, oat hulls, com cobs ground corn cobs, peat moss etc are also been used as litter materials all over the world Oliveira (1974) reported a negligible influence of litter on performance but found higher incidence of breast blister in broilers reared on sand in comparison with those on wood savings and rice husk The better growth performance of broiler bird might simply be a function of higher feed intake. Feed consumption followed similar trend to that of weight gain. These non significant differences in growth performances support the finding of Haque and Chwodhury (1994), Anisuzzaman and Chowdhury (1996), and Findings of the study clearly indicate that all broiler farms made good profit and the large farms, however, carried little higher profit.

According to the BBS, (2008) about the 19.8% protein of animal origin comes from poultry. 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. They can be utilized feed efficiently for meat production. 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 2.75:1 (Broiler palan Nirdeshikha, 1999).

Average energy intake is 1925 kcal as against the requirement of 2273 k. cal/day/capita. It is the biggest deficit. The deficit in the intake of children and expectant and nursing mothers is the severest. Thus picture is more serious in the rural areas. To meet the notational requirement of our country needs to produce more meat, egg along with other food items.

With the support of public sector the existing commercial poultry meat production system has been developing in the country with some emerging problems of different nature. Both commercial and smallholder producers are involved in broiler production. Commercial poultry rearing is extended to upazilla level andaverage 115 broiler farms were found in each upazilla. Rahman (2003) described a linear increase in broiler meat production in the last decade. Poultry meat contributes 29percent of the total meat in Bangladesh. Contribution of poultry to GDP and foreign exchange is essential to be 4.31 percent (GOB 1999) Poultry is one of the most prospective sectors for development It is a quick money returnable enterprise mat needs relatively small initial investment (Raha 2007).

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 consider 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. FCR is dimension less that is there are no measurements units associate with FCR. Birds that have low FCR are considered efficient users of feed. FCR can be measured as:

FCR (Feed conversion ratio) = Total feed intake in kg/Total weight gain in kg

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. 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.

There are 72 commercial broiler farms present in the Madhukhali upazila. Most of the farmers have small to medium size broiler farm with 500-1000 birds. All farmers rear their bird under intensive farming system. They use the vaccination schedule of that hatchery from where the chicks are brought. Different farms use different company feeds. Poultry practitioner are not available in this upazila.

 However, very little number of studies are found in literature about the FCR on normal commercial broiler farms. Therefore, the present study was undertaken with the aim of knowing the broiler raising at Madhukhali upazila, Faridpur. To achieve the aim the following specific objectives were studied.

**Objectives**

1) To study the management of commercial broiler farming at Madhukhali upazila.

2) To study the live weight and live weight gain of commercial broilers.

3) To know the feed intake and FCR.

4) To know the income from broiler rearing.

**CHAPTER II**

**REVIEW OF LITERATURE**

The following literatures were reviewed related to experiment undertaken and parameters that were studied

**2.1: Breed**

A group of animals related by descent and similar in most characters like general appearance, features, size configuration , etc are said t o be a breed.There may be considerable differences between individuals , still they have as a group many common points which disdincguish them from other groups. Such a common characteristic group is termed a breed. **( Banerjee, 1998).**

In Bangladesh different poultry breeds or breed combination are used.

According to **Saleque, (2007)** the commercial system uses breeds such as for broiler: Hybro –PN, Hubbard Classic, Cobb 500 ,Hybro-PG. **Bhuiyan,( 2005)** reported that, In Bangladesh non descriptive local chicken are dominant and small population of Naked neck, Aseel, Hilly and Red jungle Fowls are also available.

**2.2: Management**

Management is the art and science of combining ideas, facilities, processes, materials and labour to produce and market a worthwhile product or service **( Banerjee,1998).**

The poultry farmers of Bangladesh are faced with different problems these are breeding, feeding, housing, prevention and control of diseases **(Kashem and Sarker, 1998**) Similar findings were also reported by other researchers **(Rahman, 2003)** but they mentioned these are the key points of success in poultry.

**Miah (1990 )** surveyed small scale poultry farmers in saver areas. The purpose of the study was to determine the profitability of poultry farming. The researcher found that the average numbers of birds in small and medium farms were 589 and 3139 respectively. the average annual costs per small medium farms were Tk. 136788 and 567034 respectively. The income earned from small and medium farms were Tk. 308779 and 1480302 respectively. The researcher also found that the profitability of poultry farming was positively co-related to the size of individual farms. Similar findings were also reported by other researchers (**Raha, (2007)**) but they mentioned these are the key points of.the private sector particularly in the hands of small scale

**Chowdhury et al. (2003)** reported that the exotic broiler parent’s chicks can successfully reared in open sided house.

**2.3: Live Weight and Live Weight Gain**

The weight of an animal before it has been slaughtered and prepared as a carcass is termed as live weight (Oxford University Press ,British & World English).

**University of Arkansas (**February 17, 2008) has been stated that: “If you grew as fast as a chicken, you’d weigh 349 pounds at age 2 weeks.” While this statement may have been originally intended to be a humorous way of emphasizing the rapid growth of commercial broiler chicken strains, it is highly misleading and has been misused.

**Yasmin et al. (1989)** studied the characteristics of backyard poultry farmers in Bangladesh. Findings of the indicated that 17% had low knowledge, while 13% had considerable knowledge. Statistical tests revealed that education, family size, occupation, number of birds and extension contact of the farmers had a positive and significant relationship with their knowledge on poultry production.

 **Goliomytis et al.*(2003)*** Body weight; yield of the major carcass component parts of breast, leg, thigh, drumstick, breast meat, thigh meat, and drumstick meat; feed consumption; feed conversion; and mortality of male broiler chickens from two commercial strains were measured from hatching to 154 d of age. As no differences were observed between the two strains, for any of the traits measured, the statistical analysis was made using pooled data. Growth curves for BW, breast weight, and leg weight were calculated. The Richards function was chosen to fit the data. The type of the curves predicted was typically sigmoid. Asymptotic weights for BW, breast weight, and leg weight were estimated at 6,870.2, 1,744.2, and 851.5 g, respectively.

**Brmwell et al. ,1999** conducted that the curve of body weight development is more important than the at the end of rearing.The body weight of pure Leghorn was less than 2kg, which is under the minimum marketable weight for poultry product, and they had a higher (P< 0.01) feed/gain ration than the crossed birds **( Saveur, 1997 )**

**2.4: Feed intake and FCR**

Feed Conversion Ratio, or or feed conversion efficiency (FCE), is the ability of livestock to turn feed mass into body mass. A chicken's feed conversion ratio is 2:1, so by consuming 2 pounds of feed, such as corn, the chicken's body weight increases 1 pound **(wikiproject definition).**

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 2.75:1 **(Broiler palan Nirdeshikha, 1999).**

The nutrition and feeding practices of broiler has been the promising issue to improve egg production and growth performance **(Hocking, 2009).** Because the minimal impact on the overall feed coast of broiler production, accounting of less than 7% of the total feed consumed by chicken during growth **(Calini and Sirri, 2007).**The use of different feeding programs can effect how nutrients are distributed in the body during sexual maturation **( Renema et al., 2007).**

**CHAPTER III**

**Methods and Methodology**

**a) Selection of the study area**

To select area random sampling technique was followed. Madhukhali upazila under Faridpur district was selected purposively for my study.

**b) Method of data collection**

Data were collected through direct interview from the farmer by setting a designed questionnaire on broiler rearing and additional data were collected by me. The data before their final use were pre-tested and modified. Data were collected UVH during my placement in upazila veterinary hospital.

**Study were carried out by keeping the following records**

**A. Socioeconomic status of the farmers**

Broiler farming was a income generating enterprise for almost all the farmers. People from all strata of the society, irrespective of religion, education, occupation and economic background were involved. The majority (80%) were Muslims, the rest were Hindu. About one third of the farmers were literate, the other were illiterate. The majority (70%) was not engaged in other form of occupation and by this occupation their economic condition was sound enough to maintain their families. All had gained their knowledge and experience of broiler farming from their farm consultant.

**B. Demographic distribution**

The broiler were non descript types widely differing phenotypes. The so-called Hab chicks, Cobb,Starbro, Hibro, ISa-I 757 are common. The other popular strain are Isavedete, Shevar master, Ros -100 etc.

**C. Husbandry practices**

The most practical program for broiler rearing has been the use of all-in, all-out system in which only one age of broilers is on the farm at the same day and later sold on the same day, after which there is a period when no birds are on the premises. This lack of birds breaks any cycle of an infectious disease; the next group of birds has clean start with no possibility of contracting a disease from older flocks on the farm.The downtimes maintain the farmer ranges from 14 to 16 days.

**i) Flock Size**

The majority (85%) of flocks comprised 500-600 birds within the overall range between 500-1000.

**ii) Housing**

There are different styles and designs of houses such as shed type, combination type, Gable type etc. During my study I have seen that the farmer constructed gable type house for bird which is made by bamboo and tin and swing the wire net around the houses, the houses are south facing and well ventilated.

**iii) Floor, Feeder and water space are shown in the following table.**

Table-1:Floor, Feeder and water space

|  |  |  |  |
| --- | --- | --- | --- |
| **Age** | **Floor space** | **Water space** | **Feeder space** |
| First week | 0.5 Sqft/bird | 0.5 inch/bird | 1 inch/bird |
| Second week | 0.5 Sqft/bird | 0.75 inch/bird | 1.5 inch/bird |
| Third week | 1 Sqft/bird | 0.75 inch/bird | 1.5 inch/bird |
| Fourth week | 1 Sqft/bird | 1inch/bird | 2 inch/bird |
| Fifth week | 1 Sqft/bird | 1inch/bird | 2 inch/ bird |

\* Water is supplied from tube-well.

**iv) Chick transportation**

Farmers are started their rearing program from day old to market age. They started their program by collecting the chick from hatchery or other selling enterpriser. After collection most of the farmer transport their chick by taxi or tempo. It is rioted mat chick is packed in paper box, which is supplied selling enterpriser or hatchery.

**v) Preparation to be taken by the farmer before arrival of the chick in the house**

At first disinfected the floor of the house by iosan, phenol bleaching powder or limewater before placing the litter materials. But among the disinfectants the farmer most commonly uses iosan and bleaching powder

- The farmers fumigate the house before 10 days of arrival of chicks I and they follow the following formula for fumigation.

Potassium permanganate (ppm): Formalin (40% formaldehyde))

i.e. 60 gm Potassium permanganate + 120 ml formalin for 100 cubic ft areas.

- Then applied litter materials. Rice husk and saw dust were widely used by the farmers with a depth of 1-2 inch. The other litter materials are wood savings, straw or leaves etc.

- Surrounding the brooding area by the use of plastic sheet.

- Brooder was run 3 hours before arrival of chicks with a temperature of 900 to 950 F.

**(iv) Treatment just after arrival of the chick in the house**

After arrival of the chick in the house farmers firstly gave water to the chick with the mixer of Glucose, Vitamin and minerals. Then feed is given in a paper sheet for the first 3 hours, after that feed was given in feeder. Number of waterer and feeder used by the farmer is shown in following table.

**Number of Feeder**

In the selected farm they used two types of feeder, these are chicks feeder and tube feeder. Chicks feeder were used during 0-2 weeks, 2 ft long feeder for 50 chicks and tube feeder during 3-5 weeks 4 in number /100 birds.

**Number of waterer**

The farm owner used plastic drinker as water.

During 0-2 weeks ------------- 1 plastic drinker/ 50 birds.

During 3-5 weeks ------------- 1 plastic drinker/ 50 birds.

**vii) Brooding**

Artificial heat was use in brooding chick. It was seen that 5-10 brooder/500 bird and electric bulb were used by the farmers as a heat source for the first 2 weeks of age. Number of electric bulb were used by farmers for heat source is shown in following table.

Table-2: Number of electric bulb for heat source

|  |  |
| --- | --- |
| **Number of chicks** | **No. of electric bulb** |
| 500 | **Summer** | **Winter** |
| 100 watt 2 in number and 60 watt 1 in number  | 200 watt 2 in number and 100 watt 2 in number  |

After 2 weeks brooder guard had been withdrawn and the broader house are used as grower house.

**viii) Temperature schedule for broiler Brooding is given in following table.**

Table-3: Temperature schedule for broiler Brooding.

|  |  |
| --- | --- |
| **Age (Weeks)** | **Temperature of Brooding** |
| 0-1 | 900F  |
| 1-2 | 850F  |
| 2-3 | 800F  |
| 3-4 | 750F  |
| 4-5 | 750F  |

**ix) Litter Management**

 The selected farm used rice husk as litter materials and the depth of the litter during winter season was 1.5 to 2 inch and during summer season 1 inch.

**x) Lighting schedule of broiler farm is shown in following table.**

Table-4: Lighting schedule of broiler farm

|  |  |
| --- | --- |
| **Age (days)** | **Light/day (hour)** |
| 1-3 | 24 |
| 4-7 | 23 |
| 8-14 | 20 |
| 15-21 | 8 |
| 22-28 | 8 hours dark at night  |
| 29-35 | 8 hours dark at night  |

**xi) Feeding**

 Since feed constitutes about 70% of the cost of producing broilers, it is important to give special attention to it. In this respect farmers follow the literature of the feed company. It has been seen that all the farmers used two different quality of feed and it was given firstly in paper sheet (First 3 hours) and then in feeder.

To prevent the wastage of feed, farmers give the feed in the feeder by considering followings

Fully filled 30% wastage

2/3 filled 10% wastage

1/2 filled 3% wastage

1/3 filled 1% wastage

Farmers usually followed the ½ feed level in the feeder. The feeder were be kept up to the neck level of the bird.

**xii) Incidence of diseases, mortality pattern and health maintenance program**

- Incidence of disease

There was no serous outbreak of disease observed in the selected farm during my study.

-Mortality was recorded highest 3% in unknown causes.

**Health maintenance program**

A health program is fundamental for successful broiler production. Under health program fanners only done vaccination and used foot bath (1% ppm) in front of the shed.

**Vaccination schedule of commercial broiler is shown in following table.**

Table-5: Vaccination schedule of commercial broiler

|  |  |  |
| --- | --- | --- |
| Age  | Vaccine (Trade)  | Route  |
| 4th day | BCRDV  | Eye drop  |
| 11th day  | IBDL  | Eye drop  |
| 21st day  | RDV | Eye drop  |

**xiii) Marketing of Broilers**

Broilers in this region were raised and sold when age at 5 weeks either at the local market or at the farmer doorstep to individual and local traders.

 **CHAPTER IV**

**RESULTS AND DISCUSSION**

**4.1 Live weight and live weight gain**

The live weight and live weight gain of Cobb500 broiler under intensive farm are presented in table-6 and the rate of weight gains (age vs liveweight) are shown in figure -1. The figure shows that liveweight of broilers were gradually incline with the increase of age. The R2 values were very high (curve 1 and 2), which indicated the weight gain of broilers were steady and good fitted with the liner regression. From this table-6, it was seen that the broilers of the farm were increased liveweight with the increases of age. The table-6 shows that the live weight of broilers at 5th weeks of age were1481.32 gm/bird and the live weight gain of broilers at 5th week of age were 522.18gm/bird. From the table-6 ,it could be seen that weight gain of broilers in the farms were gradually increase with increase of age. That indicated that with the increase of age the broiler consume higher amount of feed that conversion into meat. The overall live weight gain of the farm 286.37gm/week/bird.

This study conducted that the liveweight of commercial broiler at 5th weeks of age is 1481.32gm/bird which is less than the research of Shahidullah et.al.(2008) who found that the liveweight of commercial broiler at 5th weeks age is 1770gm/bird. The study found that the liveweight of commercial broiler at 4th weeks age is 959.14gm/bird which is less than the report of Sarkar, 2008(1250gm/bird).

**Table -6: Mean Live weight and Live weight gain of birds**

|  |  |  |
| --- | --- | --- |
| **Traits** | **AverageLive weight (gm)/ week** | **Live weight gain(gm)/week** |
| Day old | 49.45±0.59 | - |
| 1st week | 149.54±2.37 | 100.09±2.03 |
| 2nd week | 298.24±3.39 | 148.70±1.88 |
| 3rd week | 542.44±3.56 | 244.20±1.82 |
| 4th week | 959.14±9.47 | 416.70±7.38 |
| 5th week | 1481.32±19.66 | 522.18±13.90 |
| Overall | 580.02±6.5 | 286.37±25.30 |

|  |  |  |  |
| --- | --- | --- | --- |
|  | a (intercept) | b (slope) | R2 |
| Live weight of birds | -122.20 | 40.13 | 0.92 |
| Live weight gain of birds | -22.51 | 14.92 | 0.97 |

**4.2 Feed intake and feed conversion efficiency**

The average weekly feed intake andfeed conversion efficiency (FCR) of the Cobb500 broilers under intensive farm are presented in table-7 and the rate of feed intake (age vs feed intake) are shown in the figure-2. The figure shows that feed intake of broilers were gradually increased with the increase of age of the bird. The higher R2values indicated that the feedintake of broilers were good fitted with the linear regression. The table-7 shows that the feed intake of broilers at 5th week of age were 1044gm/bird/ week.From the table-7 ,it could be seen that FCR of broilers in the farms were gradually increased with increase of age of the bird. That indicate that with the increase of age the broiler consume higher amount of feed that conversion into meat. The overall feed conversion efficiency of the Farm was 1.75 in each week.

This study found that the FCR of broiler is 2.00:1 at 5th weeks age which is more than the research Goliomytis et.al.2003 who found the FCR 1.78:1. P.k.Sarkar, 2008 reported that the

FCR of commercial broiler is 1.62:1 at 28 days but this study found that the FCR of commercial broiler is 1.99:1 at 28 days which is more than Sarkar report, (2008).

**Table-7: Mean Feed intake and Feed Conversion Ratio(FCR) of birds**

|  |  |  |
| --- | --- | --- |
| **Traits** | **Feed intake of birds/week(kg)** | **Feed Conversion Ratio(FCR)** |
| Day old | - |  |
| 1st week | 55±1.08 | 1.00±0.03 |
| 2nd week | 131.60±2.41 | 1.77±0.03 |
| 3rd week | 241.75±2.60 | 1.98±0.02 |
| 4th week | 415±2.35 | 1.99±0.04 |
| 5th week | 522±1.79 | 2.00±0.09 |
| Overall | 273.07±86.79 | 1.75±0.19 |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **a (intercept)** | **b (slope)** | **R2** |
| Feed conversion ratio | -184.3 | 243.4 | 0.98 |

**4.3 Cost and return from the flock**

The total cost and total income from the studied commercial broiler flock under intensive farming are presented in the table-8.The table shows that the total cost and total income were 86600Tk and 94276Tk respectively. From the table-8 it could be seen that the profit of the flock was somewhat less because of higher price of chick and feed. The table shows that the cost/bird, total profit, profit/bird were 173.2, 7676 Tk and 15.35Tk respectively.

This study found that profit/bird is 15.35Tk/bird which is less than the report of P.k.Sarkar 2008(21.11tk/bird). This study found that profit/bird is 15.35Tk/bird which is more than the report **of**  Shaikh et al. who found 6.56tk/bird.

**Table-8: Cost and return from the flock**

**Cost:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Flock Size | Chick Cost | Feed Cost (Up to 35 days) | Electricity, Labor, Litter, Medicine/ Vaccine cost | Miscellan--eous | Total | Cost/bird |
| 500 | @ 45Tk/chick=22500  | 2.73kg/bird@ 40.00Tk. =54600 | @ 15Tk/bird = 7500 | 2000 Tk.  | 86600 Tk.  | 173.2tk |

**Income:**

|  |  |  |  |
| --- | --- | --- | --- |
| Flock size  | Sale price | Profit | Profit/bird |
| 500 | @130/ Kg = 490×130×1.48 (2% mortality ) = 94276 Tk. (1.48 Kg/bird)  | 94276-86600 = 7676Tk.  | 15.35Tk. |

**CHAPTER V**

**CONCLUSION**

From the study it can be seen that the body weight of Cobb500 which was achieved through proper care and management of broiler rearing by the studied farm. The liveweight, liveweigh gain, feed intake and FCR at 5th weeks of age were 1481.32gm/bird, 522.18gm/bird/weeks, 1044gm/bird/week and 2.00:1, respectively. It also found that the cost /bird and profit/bird were 173.20Tk and 15.35Tk, respectively. If all the managemental factors such as feeding, watering, temperature, lighting, sanitation, vaccination, disease control, diagnosis of disease and medication are properly practiced, then the production could be achieved. Further more intensive research is needed with larger sample size for final recommendation on the broilers.

**CHAPTER VI**

**References**

**Islam, M S, Takashi, S and Nahar Chhabi, K Q. 2010**. Current Scenario of the Small-scale Broiler Farming in Bangladesh: Potentials for the Future Projection. *International Journal of Poultry Science, 9: 440-445.*

**Saleque, Md. A. 2006.** Poultry industry in Bangladesh: Current S, Presented in the tatus and its future, presented in the seminar organized by Chittagong veterinary and Animal sciences University.

**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.

**Anisuzzaman and Chowdhury, S. D.-1996**. An Economic Study On Poultry farms In *Bangladesh Journal Of Livestock Research*, 1-5:161-174.

**Agarwal , P K. 1986**. The Role of Poultry Husbandry. 1:378-381.

**Oliveira, 1974**. Observed that different types of litter material had no significant effect on growth rate, Complete Handbook of poultry keeping, 1: 55-57.

**Haque Q M E, and ChowdhuryS. D.,1994.** Current Status Of Poultry Production and Marketing System In Bangladesh, Agricultural Research Project –II.

**Verma, D. N. 1989.**, Clinicopathological Study of Poultry. Times of India, Apr 21. Page no. 23-24

**Soni. 2003.** *Nutrition and Food Science,* 03:219-229.

**Jadhav M.F. Siddiquei 1999.** Hand book of poultry production and management. Page no-121-127.

**Rahman, M. 2003,** Growth of poultry industry in Bangladesh. Poverty alleviation and employment opportunity7 3rd international poultry show and seminar. Bangladesh China Friendship Conference centre shere-e-Bangla Nagar, Dhaka, Bangladesh.

 **Hocking, 2009.** Growth performance and egg production in Cobb500 broiler parents. Journal of Applied Poultry Science; 154-162

**Calini, F and Sirri, D. F. 2007.** Breeder nutrition and offspring performance. Word Poultry Science Journal Poultry Conference, Veron, Italy.

**Raha, S. K. 2007.** Broiler industry in Bangladesh: Some issues. In proceeding of the 5th international poultry show and seminar. World’s Poultry Science Association, Bangladesh branch. March 01-13.At Bangladesh –China Friendship Center, Dhaka, *Bangladesh.*

**Renema, R. H., Robinson, F. E. , Fedds, J. J. R., Fasenko, G. M. and Zuidhof, M. J. 2007**. Egg production parameters *Poultry Science,* 80: 1121-1131

**Saveur, B 1997.** Less criteress et facteurs de la quality des poulets Label Rouge.Production. *Animates.Vol: 10*

**P. K. Sarkar1, S. D. Chowdhury1, M. H. Kabir1 and P. K. Sarker2, 2008**, Bangladesh Journal of Animal Sciences,. 37(2) : 89 – 98

**Shahidullah, M., Uddin, M. and Habib M A , 2008.** Growth and Hematological changes of commercial birds,J. Bangladesh Agricultural University Journal. 6(2): 321–326,.

 **Banerjee**, G C. A Textbook of Animal Husbandry, Eight Edition**:** page no. 728,678.