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**The Author**

**ABBREVIATIONS:**

**Abbreviations Elaborations**

BBS Bangladesh Bureau of Statistics

BAU Bangladesh Agriculture University

BRAC Bangladesh Rural Advancement Committee

DLS Department of Livestock Services

DOC Day old chick

EDS Egg drop syndrome

IB Infectious bronchitis

IBD Infectious bursal disease

ND Newcastle disease

0C Degree Celsius

**HELAL (2013), A case study on the production, management system, biosecurity & hatchery management system of broiler parent stock (Cobb-500) under control housing system of BRAC poultry farm at Sreemongal under Moulvibazar district.**

**ABSTRACT**

The study was conducted to assess the management practices, production performances and hatchery management of broiler parent stock (Cobb-500) under control housing system at **BRAC Poultry Farm & Hatchery Ltd.** at Sreemongal, Moulvibazar. The study was undertaken with 27,000 broiler parent stock (Cobb-500). Result related with the average body weight gain at starter stage (0-5 week), grower stage (6-18 week), pre-breeder stage (19-23 week) and breeder stage (24th week - end) of Cobb-500 female birds was 601 gm, 1976 gm, 3045 gm and 4157 gm respectively. Similarly in Cobb-500 male birds it was 847 gm, 2515 gm, 3570 gm and 4972 gm respectively. Achieved average flock uniformity (0-65 week) of male and female birds was 81% and 80% respectively. The hen day egg production of the flock was 81%, 83%, 80%, 61.33%, 53.8% and 53.3% per week respectively at 24-38, 29-32, 33-40, 41-45, 46-55 and 56-60th week. The hatchability of eggs was observed in this farm was 78.33%, 80.42%, 880.97%, 78.61%, 78.68% and 71.85% per week respectively at the age of 24-28, 29-32, 33-40, 41-45, 46-55, 56-60th week. Overall mortality of the flock was below0.2% per week. It may therefore be inferred that Cobb-500 broiler parent stock performs well under control housing system in our country.

**Key words:** Parent stock, Cobb-500, body weight gain, uniformity, hen day egg production, hatchable egg production, egg weight, mortality, Hatchability of eggs.

**Chapter- 1**

**Introduction**

The poultry industry in Bangladesh is crucial to agricultural growth and improvement of diet of the people. This sub-sector is particularly important in the sense that it is a significant source for the supply of protein and nutrition in a household’s nutritional intake. It is an attractive economic activity as well, especially to women and the poorer sections. Poultry farms in Bangladesh have witnessed a rapid growth in recent times. With a high population and income growth, urbanisation and high-income elasticity of demand, the demand for poultry products is expected to increase appreciably in the future. The poultry sector in Bangladesh is very important for the reduction of poverty and creation of employment opportunities. Many people are directly dependent on this industry for their livelihood **(Selim Raihan and Nahid Mahmud,2008).**

Bangladesh is a country of serious malnutrition and food insecurity; Protein deficiency has been taken as the major contributory factor in malnutrition. The protein consumption from animal origin in Bangladesh is significantly lower than other countries. Consumption of animal protein is only 11. 8 grams **(BBS, 2001 )** per capita per day where as the standard requirement of 36 grams as recommended by UNO **(Ahmed and Islam,1985).** Bangladesh, a country burdened with serious problem of high unemployment, poverty and malnutrition, needs a special and comprehensive approach to reduce these acute problems. Poultry sub-sector is considered an important avenue to reduce these problem.

Bangladesh has a long historical record of poultry rearing under backyard farming. The revolution of commercial poultry rearing starts from before the emergence of Bangladesh and the first commercial poultry farm “The Egg and Hen Ltd.” was established in 1964 may be recognized as the mother poultry farm. In 1968-69 the Department of Poultry Science of Bangladesh Agricultural University (BAU), Mymensingh brought DOC of broiler chicks from Pakistan International Airlines and started producing broiler experimentally in the University poultry farm. During late 1980s the Department of Livestock Services (DLS), Bangladesh imported “Arbor Acres” broiler parent stock. At the same time BIMAN, Bangladesh Airlines started commercial poultry farm called ‘Biman Poultry Complex’ with a contractual agreement with “Shaver Poultry Breeding Company” of Canada. The farm supplied DOC of Broiler and layer to small farmers **(Pervin, 2004).** In the beginning of early 1990’s the production of broiler and layer emerged as an agrobased industry.

The growth of poultry industry both for egg and meat has been phenomenal during the last two decades in the developing countries including Bangladesh. However poultry rearing whether backyard or commercial farming creates provision for new employments and self employments providing an additional income especially for the rural women and acts as an important tool for poverty alleviation. Important factors in the continued growth of the poultry industry are the efficiency of poultry in converting vegetable protein into animal protein, the attractiveness and acceptability of poultry meat and eggs to people their competitive cost, the perceived healthfulness of poultry meat in human diets and the relative ease with which new technologies can be transferred.**(Chowdhury *et al*,2003**)

A few years ago the eggs of the parent stock and also day old chicks of broiler and layer were imported in our country, but now the demand of commercial layer and broiler DOC are fulfilled by our own parent stock breeder farm and they produce broiler parent stock DOC in their own hatchery **(Saleque, 2006).** There are about 130 farms involved in producing DOC of which 52.3% are in the operation. Now in the country there are 5 breeder farms that have started rearing grandparent. The number of broiler parent stock was 2292 thousand in 2004-05 and the number of DOC produced was 192528 thousand in 2004-05 **(Raha, 2007).**

Considering this importance of poultry birds this study was undertaken in order to fulfill the following objectives-

**Objectives of the study:**

1. To know the management practices (housing, brooding, feeding, litter, lighting, growing, breeding, disease and hatchery) of broiler parent stock (Cobb-500).
2. To observe the production performances of broiler parent stock (Cobb-500).
3. To observe the bio-security practices in a breeder farm.
4. To observe the hatchery management of BRAC operated breeder poultry farm.

**Chapter-2**

**Review of Literature**

**Morly (1982)** reported that the importance of the poultry industry is that it concentrates in providing employment not only to those engaged in production directly, but also for the hatchery operations, feed dealers, manufactures of incubators, building materials, processors of egg and poultry products and all dealers engaged in the marketing of egg and poultry from the time they leave the producer until they are in hands of consumers .

**Ismat A. Begum et al (2009)**Under the above circumstances, the poultry sector productivity growth needs to be fostered, through either technological development or an increase in production efficiency, in order to stand the demand pressure and self sufficiency of meat production. To this end, measuring farms efficiency is important as this could be the first logical step in a process that leads to substantial resources utilization.

**Chowdhury et al. (2003)** reported that exotic broiler parent stocks reared in open-sided house under Bangladesh conditions, in general, able to achieve expected body weight through they were found to be very sensitive to environmental stresses.

**Banerjee (2007)** stated that the production cycle may be conveniently divided into three stages or phases. Phase І (22nd week to 42nd week)- egg production 0-85%, increase body weight to mature body weight, eggs of gradually increasing size; phase П (43rd week to 62nd week)- egg production declines up to 65% and phase Ш (63rd week to 72nd week)- egg production less than 65%.

**Rahman (2003)** reported that scientific breeding, feeding, management and disease control are the key points of success in poultry improvement farming.

**Robinson and Willson ( 1996)** showed that broiler breeder when fed adlibitum restricted to achieve typical industry target weight during 22 to 26 weeks of age, difference observer. Adlibitum fed hens weighed significantly heavier and produceeggs than restricted fed hens. Scott *et al*. ( 1999) found that feed restriction reduce body weight and proportionately to the restricted level that was with the decreased body.

**Krishnappa *et al*.** (1992) concluded that feed restriction growth (7-22) weeks significantly reduced body weight, increased age at sexual maturity and also increased egg production. Birds lower than normal body weight group produced fewer fertile eggs than the other two groups. Spralt and Leeson (1987) reported that excess intake is predominantly stored as fat gradually results in increased body weight. Excessive body weight broiler breeder females were negatively correlated with hen day egg production.

**Singh (2004)** stated that the hatchery operators should be able to distinguish between the poor hatchability due to the true infertility and those resulting from embryonic mortality. The latter category represents the hatchability problems. There are four stages during the embryonic growth when the mortality is more than average. Stage-1(before the egg is laid), stage-2 (2nd-4th day), stage-3 (7th-18th day) and stage-4 (19th-21st day).

**Winter and Funk (1956)** reported that the health of the flock and housing conditions influence fertility. Good fertility cannot be expected unless the birds are vigorous and active.

**Al-Saffar et al (2006)** stated that it is extremely important that poultry industry implement a comprehensive biosecurity program in their farms to ensure better quality production. Most of the poultry industries in the world have developed biosecurity measures to maintain the safety of poultry from biological hazards and be used for protection and disease control of the poultry. However, in many cases, these program measures including vaccination are not applied or followed properly because a comprehensive program usually is not in effect)

**Chapter-3**

**MATERIALS AND METHODS**

The study was conducted about 27000 birds to learn about management, production performance, treatment and bio-security practices in BRAC Poultry farm and Hatchery Limited, Sreemongol, Moulvibazar, during January 2012. The management practices follows during my study period are described –

**3.1. Housing Management:**

The birds were reared under farming condition at controlled housing systems of management. At four two storied shed were slat cum littered floor. Brooding of both males & females and grower males were reared on the littered floor and on the other hand grower females and breeder males & females were reared on the slat cum littered floor. In slat cum littered floor the ratio of slat and littered floor was 2:1. All sheds were gable type building.

Different floor spaces were supplied to birds at different age of birds. The actual floor spaces were provided in the farm shown in the following table.

**Table 1: Floor space provided for birds-**

|  |  |
| --- | --- |
| **Age** | **Space provided** |
| 1st week | 10 - 45 m2 per 500 birds |
| 2nd to 8th wk | 0.08 - 0.1 m2 per birds |
| 9th to 12th wk | 0.1 - 0.15 m2 per birds |
| 13th to 18/20th wk | 0.15 - 0.20 m2 per birds |
| 19/21st to end | 0.20 – 0.25 m2 per birds |

Here controlled ventilation were practiced in this farm & hot air of shed expelled by using exhausts fans. The controlled sheds here tunnel ventilation system was practiced. In this system, cool air entered through linear cooling pad at the one end of the shed and on the other end of the shed hot ammoniated air of the shed was expelled by exhaust fan. Each shed had two linear cooling pad and four exhaust fans. Each exhaust fan was capable of removing 50,000 cubic feet of air per hour.

**3.2. Preparation of the Shed:**

After culling of the flock, minimum two months (60 days) rest period was provided for all sheds. It was done for breaking the life cycle of organisms. After end of previous flock there were organoleptic types insecticides were used immediately. The insecticide was sprayed over the floor and wall. All kinds of instruments and premises (litter materials, loose fittings like, feeder & light and plastic slats were removed from the shed. The floors and walls were cleaned by through brushing with brush and brooms. Then a through washing of floors and walls were done with water mix with detergent and disinfectant .After washing lime mixed water was used for disinfecting the building walls, wires and floors. The roof were disinfected with a broad spectrum disinfectant by spraying with spray machine. Equipments were disinfected with detergent, finally a through wash with clean water. Before entering a new flock and after setting the all equipments in the shed a 2x strength fumigation was under taken in the shed. They fumigate the shed with 60 gm potassium and 120 ml formalin for per 100 sq. feet area of the shed.

**3.3. Litter Management:**

Litter management also an important part of the poultry farm activities. It is said that “litter of a shed is the mirror of management and health status of the farm.” Treated rice husk was used in the farm with copper sulfite and a coccidiostat. Daily morning tiering the litter the farm with the help of belcha. After culling of the flock litter materials were sold or disposed by burning in the disposal pit.

**3.4. Lighting Management:**

Lighting is an important management in the parent stock farm management. Sexual maturity and production performances are related with the lighting management of the farm. The principle of the lighting program is “never increase the light during grower period and never decrease light during laying period.” At BRAC Poultry Farm following lighting schedule was followed-

**Table 2: Lighting schedule followed in the farm –**

|  |  |  |
| --- | --- | --- |
| **Age**  **(weeks)** | **Duration of lighting**  **(Hours)** | **Intensity of light**  **( In lux)** |
| 1 | 24 | 20-40 |
| 2 | 16 | 10-20 |
| 3 | 14 | 5-10 |
| 4-6 | 12 | 10 |
| 7-20 | 12 | 10 |
| 21-23 | 14 | 45 |
| 24-End of laying period | 16 | 75 |

During brooding period up to 6th days they were supplied the light for 24 hours of the day then they reduced the lighting period one hours daily for four days depending on the time required for finishing feed by poultry. After this they reduced lighting period one hour daily for two days and then two hours daily for two days. At this stage the total duration of lighting was 12 hours and it was maintained up to grower stage of rearing (3rd to 18/20th weeks). After 21th weeks they increase both lighting period and light intensity in the shed of 14 hours and 45 lux respectively, after 23th week this was 16 hours and 75 lux.

**3.5. Water Management:**

Water is the most important and major ingredient of body cells. In this farm they were treated underground water for poultry. Water was treated with sosium hypochloride (Clotech) at the rate of 250 ml/700 liter of water, this treated water was supplied immediately to birds. In farm they practiced both manual and nipple water drinker. The water tanks, lines and nipples were flushed once in a week with acetic acid, this operation done at night. Different drugs (electrolytes, dextrose, vitamins, antibiotics, probiotics etc.) for preventing stress, diseases, controlling the effects of weather, it also done to prevent drop of egg production, poor growth, lowering hatchability provided by mixing it with water.

**3.6. Feeding Management:**

Feeding is the main part of the poultry farm management. In BRAC Poultry Farm they were used feed of their own feed mill. They formulate ration in computer. It was done by feed meal management department. In farm there were supplied four types of ration to the birds depending on the age of birds, shown in the following table.

**Table 3: Types of ration supplied in the farm-**

|  |  |  |
| --- | --- | --- |
| **Sl. No.** | **Type of ration** | **Age of birds** |
| 1 | Starter | 1st - 5th weeks |
| 2 | Grower | 6th - 17th weeks |
| 3 | Pre-breeder | 18th – 23rd weeks |
| 4 | Breeder | 24th – up to culling |

At the first week of age there were practiced adlibitum feeding of chicks. At this time chicks were supplied feed for 3 times in a day. Gradually they reduced the time feed supply and gave once in a day at the age of 6th. In first week of age chicks were supplied feed at the interval of two hours and increase this interval gradually as the number of feed supply decreased. The first feed of the day supplied at 7.00 A.M.

**Table 4: Nutritional composition rations that are supplied in the farm-**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Ration  Nutrients | **Starter** | **Grower** | **Pre-breeder** | **Breeder** | **Male** |
| **ME (Kcal/Kg)** | 2720 - 2740 | 2620 - 2640 | 2730 - 2740 | 2720 - 2740 | 2770 - 2790 |
| **CP (%)** | 20.00-20.50 | 15.4 - 15.9 | 16.5 - 16.8 | 15.4 - 15.6 | 14.0 - 14.25 |
| **Lysine (%)** | 1.06 – 1.08 | 0.85 - 0.90 | 0.80 - 0.85 | 0.75 - 0.80 | 0.70 - 0.75 |
| **Methionine (%)** | 0.45 – 0.50 | 0.45 - 0.50 | 0.40 - 0.45 | 0.45 - 0.50 | 0.40 - 0.50 |
| **Ca (%)** | 1.40 – 1.50 | 1.2 - 1.4 | 1.2 - 1.4 | 3.0 - 4.0 | 1.1 - 1.2 |
| **Av. P (%)** | 0.80 – 0.90 | 0.75 - 0.80 | 0.40 - 0.45 | 0.50 - 0.55 | 0.45 - 0.50 |

**Table 5: Daily feed supplied for per male and female birds-**

**At starter period:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Age in week** | **Program**  **followed** | | **Males (gm/ birds)** | | **Females (gm/ birds)** | |
| **Recommended** | **Supplied** | **Recommended** | **Supplied** |
| 1 | 7/0\* | | Ad Lib. | 41 | Ad Lib. | 41 |
| 2 | 7/0 | | Ad Lib. | 52 | 38 | 54 |
| 3 | 7/0 | | 60 | 60 | 40 | 45 |
| 4 | 7/0 | | 62 | 67 | 47 | 49 |
| 5 | 7/0 | | 65 | 78 | 49 | 52 |
| \* No fasting in the week and feed supplied for seven days of the week.  **At grower period:** | | | | | | |
| 6-8 | | 6/1\* | 70 | 83 | 53 | 60 |
| 9-10 | | 5/2\*\* | 74 | 82 | 56 | 62 |
| 10-12 | | 5/2 | 80 | 84 | 60 | 67 |
| 13-15 | | 5/2 | 84 | 87 | 70 | 75 |
| 16 | | 4/3\*\*\* | 87 | 90 | 80 | 84 |
| 17 | | 4/3 | 90 | 93 | 84 | 89 |
| 18 | | 4/3 | 93 | 98.5 | 89 | 96 |
| \*\* One day fasting in a week and feed supplied for six days of the week.  \*\*\* Two days fasting in a week and feed supplied for five days of the week.    **At pre-breeding period:** | | | | | | |
| **Age in week** | **Program**  **followed** | | **Males (gm/ birds)** | | **Females (gm/ birds)** | |
| **Recommended** | **Supplied** | **Recommended** | **Supplied** |
| 19 | 5/2 | | 100 | 108 | 94 | 98 |
| 20 | 5/2 | | 105 | 117 | 100 | 111 |
| 21 | 5/2 | | 110 | 129 | 108 | 119 |
| 22 | 5/2 | | 120 | 135 | 115 | 128 |
| 23 | 6/1 | | 125 | 144.5 | 121 | 134 |
| 24 | 6/1 | | 125 | 145 | 122 | 136 |
| **At breeding period:** | | | | | | |
| 25-40 | | 7/0 | 125-150 | 130 - 135 | 125-140 | 140 - 168 |
| 40-70 | | 7/0 | 125-150 | 130 - 135 | 125-140 | 150 - 160 |

**3.7. Vaccination Program:**

The most efficient way of diseases prevention is vaccination program. Vaccine is a type of processed microorganism of the same disease; it may be live or killed. The role of vaccine is to produce antibody against microorganism of the disease, to protect the bird from that disease. For successful vaccination program, it is important to maintain a cool chain from preservation to vaccination. Use of appropriate diluents and maintain its correct ratio, route of administration, dose of each vaccine is also important. Vaccination program that was carried on in the broiler parent stock farm given below-

**Table 6: Vaccination and Deworming schedule practiced in farm:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SL NO** | **Days or Weeks** | **Vaccine** | **Disease** | **Route** |
| 1 | Day-1 | Ma5 + Clone30 | ND+IB | Eye drop |
| 2 | Day-4 | Immucox | Coccidiosis | Drinking water |
| 3 | Day-5 | Reo live (Reo-1133) | Reoviral infection | As per recommendation |
| 4 | Day-11 | Gumboro D 78  G+ND Killed(1/2dose) | ND+IBD | Eye drop  As per recommendation |
| 5 | Day-21 | Gumboro D 78 | IBD | Eye drop |
| 6 | Day-28 | Ma5 + Clone30 | ND+IB | Eye drop |
| 7 | Week-5(Day-3/4) | Pox vaccine | Fowl pox | As per recommendation |
| 8 | Week-6(Day-3/4) | Coryza vaccine | Infectious coryza | As per recommendation |
| 9 | Week-6 | SG9R  Deworming | Salmonellosis | As per recommendation |
| 10 | Week-6(Day-1) | Ma5 + Clone30  MG vaccine | ND+IB  Mycoplasmosis | Eye drop  As per recommendation |
| 11 | Week-9 | Cholera vaccine(Multimune k5) | Salmonellosis | As per recommendation |
| 12 | Week-10(Day-3/4) | Reo live | Reoviral infection | As per recommendation |
| 13 | Week-12(Day-1/2) | AE+ Pox vaccine | Fowl pox | As per recommendation |
| 14 | Week-12(Day-3) | Deworming |  | Drinking water |
| 15 | Week-13(Day-1) | Ma5 + Clone30  Coryza vaccine | ND+IB  Infectious coryza | Eye drop  As per recommendation |
| 16 | Week-14(Day-4/5) | MG Vaccine(MG inac) | Mycoplasmosis | As per recommendation |
| 17 | Week-15(Day-6/7) | SG9R(Salmonella vac) | Salmonellosis | “ |
| 18 | Week-16 | Cholera vaccine(Multimune k5) | Salmonellosis | “ |
| 19 | Week-17 | EDS Vaccine  Deworming | EDS | As per recommendation  Drinking water |
| 20 | Week-19 | Reo+IB+ND Killed  ND lasota |  | As per recommendation |
| 21 | Week-23 | Deworming |  | Drinking water |

**3.8. Management during Brooding Period:**

Brooding of chicks was done in the deep littered shed for 2.5 to 4 weeks depending on seasons. Then female chicks were released from the chick guard to whole shed of slat cum littered floor and male chicks were also remained on that shed. A good brooder house is essential for proper control of temperature and continuous supply of fresh air. Chick guards were made of pitch board and tin sheet. The gas brooder was set approximately 3 ft above from the floor. BRAC Poultry Farm collected chicks from the Aga poultry farm @ 300-350 TK/DOC.

In the brooder stage temperature management is the most important factor in breeder farm. It is related with chick’s growth and future production performance. In BRAC Poultry Farm, they followed the following temperature schedule;

**Table 7: Temperature schedule followed during brooding stage-**

|  |  |
| --- | --- |
| **Age (in weeks)** | **Temperature( 0C)** |
| 1 | 35 |
| 2 | 30 |
| 3 | 25 |
| 4 | 20 |

Debeaking was done two times in the farm, first at the age of 6thday and second at the age of 12th week. Debeaking means beak trimming and is very important for parent stock management. It is done to prevent cannibalism, effective feed utilization through lowering feed wastage. Debeaking done by electric debeaker. As precaution Vitamin K was supplied with water before and after debeaking. Before debeaking tongue was pushed backward and then front 1/3 part of beak was trimmed by the beaker.

100% grading is done 3 time before start laying. The weak, under weighted birds were transferred to a separate partions and they were provided separate feeding from others. Birds were weighed in a bucket. Culling stunted, deformed, diseased etc. birds were done regularly in this farm.

**3.9. Management during Grower Period:**

After 6th weeks of age and then up to 18th weeks of age birds were treated as grower and at this time they were supplied the grower ration. This is the period of reproductive organ development and controlling of body weight gain.

In this period skip a day feeding was practiced at BRAC Poultry Farm. This is done for proper feed utilization and maximum uniformity of the flock. At the age of 7th to 8th weeks 6/1 program of feeding was practiced i.e. one day fasting in a week; at the age of 9th to 15th weeks 5/2 program of feeding was practiced i.e. two days fasting in a week and at the age of 16th to 18th weeks 4/3 program of feeding was practiced i.e. three days fasting in a week. This skip a day feeding was practiced carefully to avoid starvation, nutritional deficiency, cannibalism and weight loss. This skip a day feeding program accelerate the length of peak egg production and hatchability.

For deworming a broad spectrumed anthelmentic (Levamisole) was used to prevent and control the worm infestation in birds. It also done for the success of vaccination and preventing mal nutrition. Livamisole was supplied @ 0.8 mg/birds with water in the morning.

Regular weekly body weight, uniformity of the flock was measured in the farm. It is important to know the body gain and present body weight of birds in a poultry farm. Body weight measurement done once in a week and is usually performed in the off feed day of the week.

**3.10. Breeder Management:**

Male was exposed to females when start to laying. BRAC Poultry Farm was followed the 10:1 (one male in ten female birds) ratio.

Female feeders were placed on the slats of two sides of shed and these female feeders were grilled to prevent male consumption of female feed. It was done to avoid over weighing of male birds. Male feeders were placed on the littered floor and hang higher to prevent female consumption of male feed.

Nest boxes were supplied in the breeder shed at the age of 23nd weeks for laying. In this farm nests were made of tin or steel sheets and all were two storied. Each nest had 24 nest boxes and size of each box was (1.5 × 1 × 1) cu. ft. Nests were two faced and they placed half on slat and half on litter floor. Sufficient number of nests was provided in shed calculating four birds for per nest box. In the nest box metal pad and rice husk were used as bedding materials.

First egg was laid at the age of 23th weeks of age and peak production at the age of 31nd weeks. Eggs were collected for seven times in a day from the sheds. This operation was done by the single individual attendant for respective pen. It is done quite calmly, so that other birds in the nest not to be disturbed. After collection of eggs, they were graded into hatchable eggs (Grade A and Grade B) and table eggs (broken, double yolked, thin shelled, deformed) by placing them on the grading table. This operation was done by experienced worker. Eggs which were soiled with feces, they were cleaned by washing solution. Then hatchable eggs were fumigated in a trunk. For egg fumigation they used 8 gm PPM and 16 ml formalin i.e. fumigation of 2× strength. They fumigate eggs for 15 to 20 minutes. Hatchable and table eggs were transported by rickshaw van. Table eggs were transported to office storage room and hatchable eggs were transported to hatchery.

**3.11. Hatchery Management:**

Hatchery is the economical point of the breeder farm. After collection of eggs, they were stored in the cold storage room for three to four days. In cold storage room temperature of 16 to 180C and Humidity of 65 to 75% were followed. During storage eggs were set small end down and large end upper in the trey.

Before setting the eggs all equipments were washed by water mixed with bleaching powder, H2O2 and detergent. After washing trey were dried in the Sun light and fitted in the setter and hatchers machine. Before egg loading in setter and transferring in hatcher a 2X strength fumigation was done for 15 minutes. Eggs were sated in setter machine twice in a week. Each trey had provision for setting 150 eggs. This operation done during aftenoon, after loading eggs was pre-heated. Treys were loaded in the setter machine at next morning. In setter machine setter treys were turned automatically in every two hours interval up to 18th days of incubation. Eggs in setter were regularly checked to detect brusting of eggs. At 18th days of incubation eggs were transferred to hatcher machine. These operations were done in the hatchery as quick as possible.

After hatching (21st days of incubation) chicks were graded in to three grades called Grade A, Grade B and Grade C. This grading was done on the following criteria like navel condition, vigor, and other deformity. After grading chicks were packed in a special packet of four chambers and each packet contained 50 chicks. All hatchery waste was gathered in drums as quick as possible and then all buried in the earth.

**3.12. Bio-Security Management**

The term "biosecurity," is derived from two words; "Bio" means "life" and "security" implying to some sort of protection. Hence, "biosecurity" refers to a type of program that is designed to protect life **(Shane *et al*. 1995).** Biosecurity is a modern practice introduced out of a need to protect the poultry from an intentional or unintentional threat of a biological agent. In everyday management, biosecurity is an endless endeavor to keep viral disease agents or the spread of such disease agents at bay. Biosecurity is even more important today because of the avian flu disease, type A influenza, which has been in the global news lately, Wild water birds are the natural carriers of this virus from where it can spread to domestic poultry and become fetal. Type

A influenza can occur in many forms. Humans and some other animals are susceptible to some of these forms, but poultry are susceptible to all of them. Any time there is an outbreak, health officials are concerned because influenza viruses continuously change and officials have to determine how it happened and if it can become epidemic. Therefore, biosecurity of poultry farms is an important and vital practice to reduce the burden of any disease producing agent in any commercial operation. Biological hazards or biological agents, infectious/noninfectious, are such things as viruses, bacteria, fungi, and protozoa are responsible for disease out break in poultry. Biosecurity, including vaccination programs, is used for protection and disease control.

Any general biosecurity program should include three major elements: isolation, traffic control, and sanitation **(Jeffrey, 1997; Cardona and Kuney, 2001; Vaillancourt, 2001).** Isolation can be considered in terms of time “time between in-out and refilling a poultry house”, distance between farms or houses in a farm, and physical barriers (fences, showers, foot baths) all of which limit the spread of disease agents. Traffic control includes restricting human, equipment,

and animal movement onto the farm, and movement patterns within the farm. The most common visitors to the poultry farm are the most dangerous because they are likely to have had recent contact with other poultry. Included in this group are feed delivery trucks and their drivers, field service personnel, vector-control personnel, hatchery and transport trucks and tier, veterinarians

and utility personnel, and repairmen and guests. One of the most effective ways to control human traffic coming onto the farm is with the use of signs. Signs should be clear and posted in areas where people coming onto the farm will notice them. Fencing can help to regulate people access from accidentally wandering into areas of the farm that should be off limits. They can also guide

visitors to stay in areas where they are welcomed. Also, gates and fences can be used to control all access to the farm and visitors can use an off-site intercom to contact on-farm personnel.

Sanitation refers to the cleaning and disinfection of poultry housing, people, materials, and equipment. The goal of farm sanitation is to maintain a healthy environment for the chicken flock. Sanitation reduces the likelihood of poultry pathogens coming in contact with the chickens, and is, therefore, an important component of biosecurity. In order to reduce infectious agents in the environment, dead birds must be removed daily and disposed of correctly and avoiding their contact with insects, rodents or other animals that might be present on the farm. Chicken spilled feed also attract insects, rodents and wild birds that can bring pathogens into the poultry environment. Daily attention must be given to maintaining feed delivery systems in good repair, and to routinely cleanup spilled feed within the chicken house and around feed bins. **Woodger (2006)** identified three key levels of biosecurity: 1) Conceptual biosecurity that involves site planning and location of the farms, 2) Structural biosecurity which involves the design of the farm and buildings, 3) Operational biosecurity that involves day-to-day running of the farm.

**5**

To determine level of biosecurity that is practical for a particular farm, three factors should be considered: economics, common sense and relative risk **(Jeffry,** **1997)**. Furthermore, to determine the cost-benefit of a biosecurity program, one should consider facts about the economics associated with the type of production and the costs of implementing a comprehensive biosecurity program along with estimates of the relative risk and cost of disease **(Vaillancourt, 2001).** In some cases, even when a biosecurity program is in place, non-compliance has been noticed **(Vaillancourt and Carver, 1998).** The major factors associated

with non-compliance include: poor training of farm personnel, lack of communication, lack of incentive, poor record keeping of activities associated with biosecurity, and no audit of the biosecurity program. Hence the issue of noncompliance should be addressed in any biosecurity program, because noncompliance of any biosecurity program leads to an increase in the incidence of diseases because the spread of diseases becomes easier. Consequently, this

will result in significant financial losses to the industry. The following guideline can be used to assess the poultry operation beforeestablishing a biosecurity program.

The bio-security measures which were taken in the farm, were given below-

1. A sprayer at the entrance of farm. The out comers have to pass under the sprayer machine, which spray disinfectant solution and then he or she must need to take a bath in the bathroom. A wheel dips at entrance of the farm containing a solution of PPM. All vehicles were sprayed with disinfectant solution.
2. The farm area was fully restricted and entrance to the farm for unauthorized visitors was strictly prohibited.
3. All personnel should bath at washing room with soap and antiseptic solution and should wear separate uniform in the shed.
4. All sheds had separate personnel for work.
5. All shed contain a footbath at the entrance of the farm.
6. Entrance of all predators like dog, fox, cat and birds like crows were controlled by taking various programs in the farm.
7. After culling of a flock all loose fittings in a shed were removed and cleaned.
8. All waste materials of the farm were disposed aseptically on regular basis.

**Chapter - 4**

**RESULTS AND DISCUSSIONS:**

**4.1. Body Weight achieved by broiler parent stock:**

The body weight achieved by parent stock breeder birds from 1st week to 70th weeks showed in the table (8)

**Table 8: Body Weight of the broiler breeder flock–**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Age**  **( Wks)** | **Body Weight** | | | |
| **Females** | | **Males** | |
| **Target body weight (gms)** | **Achieved body weight (gms)** | **Target body weight (gms)** | **Achieved body weight (gms)** |
| 1-5 | 645 | 601 | 840 | 847 |
| 6-10 | 1050 | 1156 | 1400 | 1481 |
| 11-18 | 1930 | 1976 | 2640 | 2515 |
| 19-23 | 2845 | 3045 | 3470 | 3570 |
| 24-32 | 3615 | 3820 | 4180 | 4403 |
| 32-36 | 3695 | 3956 | 4285 | 4640 |
| 35-40 | 3770 | 4007 | 4385 | 4598 |
| 41-45 | 3830 | 4122 | 4485 | 4654 |
| 45-50 | 3905 | 4143 | 4610 | 4810 |
| 50-60 | 4015 | 4169 | 4885 | 4916 |
| 60-65 | 4040 | 4157 | 5010 | 4972 |

From table (8), it is clearly indicated that achieved body weight was always higher in female birds (except at 1-5th week). In female at 1-5th weeks of age the target and achieved body weight was 645 and 601 gms respectively at 24-32th weeks of age it was 3615 and 3820gms and at 55-60th weeks of age it was 4015 and 4169 gms. On the other hand, in male birds achieved body weight were maximum times higher than the targeted one (except at 60-65th target and achieved body weight was 5010 and 4972, respectively at 19-20th. The body weight of male always higher than the females.

**4.2. Uniformity of broiler breeder parent stock:**

Uniformity achieved by broiler parent stock male and female breeder birds from 1st week to 60th weeks showed in the table (9)

**Table 9: Uniformity observed in the broiler breeder flock –**

|  |  |  |
| --- | --- | --- |
| **Age**  **(Wks)** | **Uniformity** | |
| **Females (%)** | **Males ( % )** |
| 1-6 | 80 | 81 |
| 7-12 | 89 | 80 |
| 13-18 | 87 | 82 |
| 19-24 | 85 | 93 |
| 25-30 | 83 | 74 |
| 31-36 | 88 | 90 |
| 37-42 | 90 | 96 |
| 43-49 | 80 | 85 |
| 50-54 | 81 | 70 |
| 55-60 | 75 | 80 |
| 61-65 | 81 | 80 |

The table (9) shows that uniformity of the flock was fluctuated throughout the rearing period. Uniformity of female birds was always higher than 75% and at the age of 1-6th, 60-65th weeks was 80%, 81% respectively. On the other side, in male birds it was higher than 70% and at the age of 1-6th, 60-65th weeks was 81%, 80% respectively. Uniformity in female was higher at the age of 37-42th weeks (90%) and lower at the age of 55-60th weeks(75%). In male it was higher at 37-42th weeks (96%) of age and lower at 50-54th weeks(70%) of age. In comparison uniformity of male birds was maximum times higher.

In addition to this table the above uniformity of broiler breeder stock highlighted graphically in the following graph (1).

From above graph (1), uniformity of female birds was higher at 37-42th weeks and lower at 55-60th weeks & uniformity of male birds was higher at 37-42th weeks and lower at 50-60th 49-54th weeks.

**4.3. Hen day egg production of the broiler parent stock:**

Hen day egg production of the breeder broiler parent stock birds from 24th week to 65th weeks shown in the table (10)

**Table 10: Hen day egg production of the broiler breeder flock-**

|  |  |  |
| --- | --- | --- |
| **Age**  **(wks)** | **Hen day egg production** | |
| **Target**  **(%)** | **Achieved**  **(%)** |
| 24-28 | 78 | 81 |
| 29-32 | 83.5 | 83 |
| 33-40 | 82 | 80 |
| 41-45 | 71 | 61.33 |
| 46-50 | 66 | 55 |
| 51-55 | 63 | 53.8 |
| 56-60 | 53.33 | 53.3 |
| 61-65 | 48.3 | 51 |

Above table (10) shown that achieved hen day egg production was higher than target at 28th week then it was lower than the target up to 55th week but higher than target from 56th – 65th weeks. In first 1-4th weeks of production achieved 3% higher than the target one. At the time of peak production (31-32 week) it was almost similar to target. At 41-45th week, 46-50th week and 51-55th production was 9.77%, 11% and 9.2% lower than the target respectively. Highest production record of BRAC poultry farm was 88%.

Along with this table the above hen day egg production of broiler parent stock is shown graphically in the following graph

The graph (2) has shown the target and achieve hen day egg production in two different bar. The peak production was achieved at the age of 32nd weeks of age.

**4.4. Hatchability performances of breeder farm:**

The hatchability performances of eggs in the broiler breeder flock from 26 – 65th weeks of age shown in the table (11)

**Table 11: Hatchability performances of the broiler breeder flock-**

|  |  |  |
| --- | --- | --- |
| **Age**  **(wks)** | **Hatchability** | |
| **Target**  **(%)** | **Achieved**  **(%)** |
| 24-28 | 84 | 78.33 |
| 29-32 | 88 | 80.42 |
| 33-40 | 88.5 | 80.97 |
| 41-45 | 87.5 | 78.61 |
| 46-50 | 85 | 76.07 |
| 51-55 | 83.5 | 71.68 |
| 56-60 | 79.5 | 71.85 |
| 61-65 | 77 | 69.27 |

The above table (11) has shown that actual hatchability was always significantly lower than the standard hatchability. At 24-28th, 29-32th, 33-40th, 41-45th , 46-50th , 51-55th , 56-60th , 61-65th weeks it was 84%, 88%, 88.5%, 87.5% , 85%, 83.5%, 79.5%, 77% target and 78.33%, 80.42%, 80.97%, 78.61%, 76.61%, 71.68%, 71.85%, 69.27% achieved respectively.

Along with this table the above hatchability of broiler parent stock is shown graphically in the following graph

The graph (3) has shown that the achieve hatchability always lower than the target. The peak hatchability was achieved at the age of 33-40th weeks of age.

**Chapter 5**

**Conclusion**

The result emerged from this study clearly indicated that it is possible to rear cob-500 broiler breeders quite successfully in our country. The body weight gain, feed consumption, hen day & hatching egg production, hatchability of the eggs were close to the specified standard. The main point of rearing period is the weight gain and it should maintain carefully according to the standard for better production performances. For maintain standard body weight three thing of management is very important, these are grading, counting & feeding. During grower period restricted feeding was practiced for proper utilization of feed and better uniformity of the flock. . In our country most of the poultry farms were managed by unskilled manpower, also in BRAC Poultry Farm maximum personnel were skilled and the salary scale formulated in this farm on length of experience but there was no manager & specialist DVM or AH graduate in the farm. In fine, from this study it could be said that if the management of breeder farm is performed on the right way then the farm can achieve their goal of optimum production.

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|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SL NO** | **Days or Weeks** | **Vaccine** | **Route** | **Remarks** |
| 1 | Day-1 | Ma5 + Clone30 | Eye drop |  |
| 2 | Day-4 | Immucox | Drinking water |  |
| 3 | Day-5 | Reo live (Reo-1133) | As per recommendation |  |
| 4 | Day-6 to 8 | Vitamin K  Enro/ciprofloxacin | “ |  |
| 5 | Day-7 to 8 | Debeaking |  |  |
| 6 | Day-8 to 10 | Pulmutil AC | Drinking water | 8ml\1000 birds\day |
| 7 | Day-11 | Gumboro D 78  G+ND Killed(1/2dose) | Eye drop  As per recommendation |  |
| 8 | Day-14 & 15 | Pulmutil AC | Drinking water | 20ml\1000 birds\day |
| 9 | Day-21 | Gumboro D 78 | Eye drop |  |
| 10 | Day-28 | Ma5 + Clone30 | Eye drop |  |
| 11 | Week-5(Day-3/4) | Pox vaccine | As per recommendation |  |
| 12 | Week-6(Day-1/2) | Pulmutil AC | Drinking water | 50ml\1000 birds\day |
| 13 | Week-6(Day-3/4) | Coryza vaccine | As per recommendation |  |
| 14 | Week-6 | SG9R & Deworming | “ |  |
| 15 | Week-6(Day-1) | Ma5 + Clone30  MG vaccine | Eye drop  As per recommendation |  |
| 16 | Week-9 | Cholera vaccine(Multimune k5) | As per recommendation |  |
|  | Week-10(Day-1&2) | Pulmutil AC | Drinking water | 80ml\1000 birds\day |
| 17 | Week-10(Day-3/4) | Reo live | As per recommendation |  |
| 18 | Week-12(Day-1/2) | AE+ Pox vaccine | As per recommendation |  |
| 19 | Week-12(Day-3) | Deworming | Drinking water |  |
| 20 | Week-13(Day-1) | Ma5 + Clone30  Coryza vaccine | Eye drop  As per recommendation |  |
| 21 | Week-14(Day-1&2) | Pulmutil AC | Drinking water | 115ml\1000 birds\day |
| 22 | Week-14(Day-4/5) | MG Vaccine(MG inac) | As per recommendation |  |
| 23 | Week-15(Day-6/7) | SG9R(Salmonella vac) | “ |  |
| 24 | Week-16 | Cholera vaccine(Multimune k5) | “ |  |
| 25 | Week-17 | EDS Vaccine  Deworming | “  Drinking water |  |
| 26 | Week-19 | Reo+IB+ND Killed  ND lasota | As per recommendation |  |
| 27 | Week-20(Day-1-3) | Pulmutil AC | Drinking water | 175ml\1000 birds\day |
| 28 | Week-23 | Deworming | Drinking water |  |

**Appendix 1**

**BRAC Poultry farm**

**Vaccination, Medication & others activities for broiler breeder (0 – 23 weeks)**

**Appendix 2**

**BRAC Poultry farm, Sreemongal.**

**Body weight record sheet**

Floor……………………… Sex…………………. Pan…………………………Date……………………. Age……………….week s

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Weight  (gms) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | No of birds | Total weight (Gm) |
| **00** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 20 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 40 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 80 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **00** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 20 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 40 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 80 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **00** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 20 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 40 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 80 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **00** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 20 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 40 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 80 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **00** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 20 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 40 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 80 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **00** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 20 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 40 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 80 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Total** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

|  |
| --- |
| Total wt………………………………….. Average wt+ 10%…………………………… MIN…………………………  AV. Wt……………………………………. AV. Wt+ 10%.................................. MAX………………………  DIFF……………………………………….. Uniformity %................................... |