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**The Author**

**A STUDY ON PRODUCTIVE AND REPRODUCTIVE PERFORMANCE OF COBB 500 BROILER PARENT STOCK IN KEARI POULTRY FARM, MYMENSINGH**

**ABSTRACT**

The study was conducted in the KEARI Poultry Hatchery & Process Limited, Trishal, Mymensingh from 20th October to 15th November 2013. The objective of the study was to compare the production and reproduction performance like the body weight gain, egg production percentage and hatchability percentage of egg of Cobb 500 broiler parent stock in the existing management system of KEARI Poultry Hatchery & Process Limited with the standard or targeted level. It was revealed that the achieved body weight in case of the female broiler breeder bird was always higher than the targeted body weight gain on an average & in case of male birds achieved body weight were maximum times higher than the targeted level but sometimes it was lower. The uniformity of the female birds was lower than the male birds at 1-6 & 49-60 weeks of age and at other times it was higher than the male birds. The hen day egg production and the hatchability percentage of the flock were always lower than the standard level.

**Key words:** Parent stock, Cobb 500, Productive and Reproductive performance

**ABBREVIATIONS:**

**Abbreviations**  **Elaborations**

BBS Bangladesh Bureau of Statistics

cm Centimeter

DLS Department of Livestock Services

DOC Day Old Chick

EDS Egg Drop Syndrome

etc. Etcetera

FAO Food & Agriculture Organization

GDP Gross Domestic Product

gm Gram

IB Infectious Bronchitis

IBD Infectious Bursal Disease

i.e. That is

hr Hour

Kg Kilogram

m Meter

ND Newcastle Disease

sq. ft. Square Feet

wks Weeks

0C Degree Celsius

0F Degree Fahrenheit

**CHAPTER-I**

**INTRODUCTION**

Bangladesh is a developing country. She has small land area about 1, 47,570 sq km but large amount of population about 160 million. So in the recent years poultry rearing becomes popular than any other livestock in our country because of its small size, easy of handling, low feed intake, high multiplication rate , less space requirement, less cost & quick return of profit.

On the other hand poultry are considered as an important source of protein all over the world. The concept of human nutrition has taken as a new dimension and today emphasis has been given on the consumption of high protein and low caloric diet but in reality, shortage of protein especially of animal origin has been severely affected the health of the people of Bangladesh. It is obvious that poultry meat and eggs contain high quality proteins and can also be produced more economically than any other growers of equivalent quality. Moreover, higher multiplication rate of chicken also makes it more important than any other animal protein. So in our country the poultry meat products become popular, because these are relatively cheap, convenient and nutritious. According to DLS (2007), meat requirement is 120gm/day/head and 6.26 million metric ton/year for Bangladesh. But the achievement is only 20gm/day/head and 1.04 million metric ton/year. Poultry meats contribute approximately 37% of the total animal protein supplied in Bangladesh (Rahman and Rahman 1998). So we can say that the meat production cannot cope at with the high demand by our native chicken. For this reason the government of Bangladesh encourages the people for poultry farming as an industry. According to number provided by government of Bangladesh livestock department, the total chicken population is steadily increasing from about 143 million birds in 2006 (DLS, 2007).

For preparation of list frame, Bangladesh Bureau of Statistics (BBS) collected list of poultry

farms operating in the months July-August of 2008. The list frame shows that there were

49825 farms in Bangladesh(Table- 1 )

Table 1:Number of poultry farms by type and division.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Type of farm | Barisal | Chittagong | Dhaka | Khulna | Rajshahi | Sylhet | Total |
| Broiler | 2804 | 6666 | 10158 | 4444 | 7037 | 2116 | 33225 |
| Layer | 267 | 1068 | 5027 | 2046 | 1646 | 44 | 10099 |
| Hatchery | - | 41 | 181 | - | 5 | - | 227 |
| Duck | 251 | 42 | 2469 | 335 | 963 | 1465 | 5524 |
| Mixed | 66 | 176 | 243 | 176 | 88 | - | 750 |
| Total | 3388 | 7993 | 18077 | 7002 | 9739 | 3625 | 49825 |

Among all poultry farms 67% were broiler, 20% layer, 11%, duck and 2% others including

hatchery and mixed farms. Across divisions, the variation is observed. The following figure

(chart) shows among all the divisions maximum share belong to Dhaka division (36%) where

as minimum share for both Barisal and Sylhet divisions (7%).

Broiler breeder production is one of the profitable production activities than broiler and layer production. A broiler breeder could generate Rs. 786±49.8 % as net profit giving Rs106±7.34% return over the invested capital(Farooq et al. 2001) as compared to broiler (Rs. 7 per broiler per flock) (Asghar et al 2000) and layer farming (Rs. 38.26 ±6.66 per layer (Farooq et al, 2003). In Bangladesh commercial poultry farms are supported by 130 parent stock farms and 8 grand parent farm, which however, not always in production (Saleque, 2007). In 2006 the weekly production of day old chicks was 5542000 broiler chicks (Saleque, 2007). Saleque (2007) , reported that in 2006 five grand parent farms produced 60% of the parent broiler. The parent stock growers are always interested to select a strain that is well adaptable under local condition and is capable of producing quality hatching eggs for the hatcheries in accordance with their inherent potentiality (Hossain at al 2005).

In Bangladesh the existing native breeds are Aseel, Sarail, Nacked neck, Yasin etc. Their productive performance is not sufficient. So the commercial poultry industry uses some exotic broiler breed such as Cobb 500, Cobb100, Hubbard classic, Hybro-PN, Hybro-PG, Ross (Saleque & Rozen 2007).

A few years ago the eggs of the parent stock and also day old chicks of broiler and layer were imported in Bangladesh, 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 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). Following table-2 shows the broiler parent stock population and day old chick’s production in our country in recent years.

Table 2: Broiler parent stock population and day old chick’s production in our country-

|  |  |  |  |
| --- | --- | --- | --- |
| Type | 2003 (thou) | 2004 (thou) | 2005 (thou) |
| Broiler Parent Stock | 1952 | 2299 | 2292 |
| DOC per year | 163968 | 164148 | 192528 |
| DOC per week | 3153 | 3156 | 3702 |

Source:- DLS, 2005 and BRAC report, 2006

Cobb 500 is an English strain which shows an excellent production & reproduction performance in standard condition. It has a worldwide reputation for the lowest cost of producing chicken meat. Cobb geneticists have developed this breed by the research of more than 30 years progress using a combination of both traditional pedigree selection and new technology. They have developed a very high breeder performance of Cobb 500 .Such as Cobb 500 starts lying at 18 weeks of age. Age at 5% egg production is 24 weeks. At 65 weeks of age - total eggs/hen housed is 175, hatching eggs/hen housed is 170, peak hatchability is 91 %, broiler chicks/hen housed is 144 (Cobb breeder management guide 2009). For such high breeder performance KEARI Poultry Limited choose Cobb 500 as a broiler parent stock for rearing.

Therefore the present study was undertaken at KEARI Poultry Hatchery & Process Limited, Trishal, Mymensingh to observe the parent stock management practices with the following objectives.

1. To learn the management of broiler parent stocks.
2. To compare the achieved productive and reproductive performance with standard.

**CHAPTER-II**

**REVIEW OF LITERATURE**

Colin C. Whitehead (2010)’s recent research has demonstrated the importance of the early nutritional status of the hatched chick in enhancing performance. It is therefore vital that , in formulating diets for the parent birds, attention is paid not only to maximizing egg output and hatchability but also to ensuring that the eggs produced contain adequate amounts of the nutrients vital for supporting the early development of hatching chick.

Dr Tom Smith (2009) suggested that breeder bird must not have a deformed beak, slipped wing, blindness in one or both eyes or any defect that may interfere with normal eating, drinking, and maintaining social stature in the flock. Male birds must be aggressive and have straight, sound legs and toes. Females should reflect good egg laying traits and good health and vigor.

Dr Tom Smith (2009) also suggested that commercial hatching eggs may be collected as often as four or five times daily to ensure egg quality. Keep nest eggs separate from eggs found on the floor so disease organisms are not spread. Do not incubate dirty floor eggs; they may spread disease to clean.

R.Keith Barnwell *et. al* (2008) reported that obtaining accurate body weights is a critical part of the process of rearing replacement broiler breeder pullets and managing breeder hens and males. From the first few weeks of age in the pullet house, all feed allocations are determined by the bird’s weekly weight gains. Obtaining accurate body weights is very important to maintaining uniformity, body conformation and the overall development of pullets and young cockerels. Research has shown that accurately and uniformly controlling body weight of both replacement breeders and breeders in the hen house will result in improved performance parameters.

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 II (43rd week to 62nd week)- egg production declines up to 65% and phase III (63rd week to 72nd week)- egg production less than 65%.

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.

K. Rajendran and S. Mohanty (2003) reported that the gross and the net return from egg and others sources is more in cage system than all litter system of management.

Robinson and Wilson (1999) showed that the restricted lighting management programme for broiler breeder can helps to achieve the sexual maturity during 18 to 22 wks of age.

Wilson et. al (1995) studied with feed allocation and obtained different body weight group of broiler breeders which were regarded as treatment. He got three body weight groups-standard, lower than normal, above than normal body weight. The birds groups which have lower than normal body weight can produced less fertile eggs than the other two groups.

**CHAPTER-III**

**Materials and Method**

**3.1. Study area and population:**

The study was performed at a renowned poultry farm of Bangladesh named KEARI Poultry Hatchery & Process Limited, Trishal, Mymensingh where popular broiler parent stock Cobb 500 was reared in open sided house.

**3.2. Study Period:**

The study was conducted for four weeks of time from 20th October to 15th November 2013 during my internship placement.

**3.3. Study Population:**

KEARI Poultry Hatchery & Process Limited has two separate breeder unit named KPH-1 & KPH-2. In KPH-1 there were five breeder shed & each was with capacity of containing about 8000 birds. For the facilities of my study I had selected one flock (Flock-33) containing 7000 bird of which 6300 birds were female & 700 birds were male.

**3.4. Collection of Data:**

As because the study period was too short for any reliable study, I collected previous data of one flock (Flock-33) from the farm authority with their due concern. The data provided by the farm authority was somewhat complicated for study, hence the relevant data of the Flock-33 were first separated from the random data and prepared for the study.

**3.5. Variables of the study:**

3.5.1. Productive performance:

In general sense for a breeder flock the production can be defined as the total egg production performance of the birds of that flock in their whole production period (24th week to 60th week). On the other hand there are some other variables as body weight gain, uniformity of the breeder parent stock those can also be treated as the parameter for obtaining the actual measure of the productive performance of the flock.

In this study to measure the productive performance of the Flock-33 of KEARI Poultry Hatchery & Process Limited, Trishal, Mymensingh I conducted with three parameters, viz body weight gain, uniformity of the breeder parent stock, egg production performance.

3.5.1.1. Body weight gain & Flock Uniformity:

For a breeder parent stock body weight of the individual birds should be maintained as the standard requirement. From 1st week of rearing the feeding of the birds should be maintained in such a manner that the body weight of the birds should reach at the actual level of body weight requirement. On the other hand the uniformity of the body weight of the male and female bird intensely depends upon the feeding management. Besides this the egg production performance greatly depends upon the lighting management. If the lighting management does not meet the appropriate level than the bird may start early laying, which ultimately lowers the total egg production performance.

**Feeding Management:**

Feeding is the main part of the poultry farm management. In KEARI Poultry Farm they were used feed of their own feed mill. They formulate ration in computer. In farm there were supplied three types of ration to the female 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 - 6th weeks |
| 2 | Grower | 7th - 23th weeks |
| 3 | 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 6 – 10 times in a day. Gradually they reduced the time feed supply and gave twice in a day at the age of 12th – 15th days of chicks. Finally one time feed offered in a day at the age of day 21st to 25th. 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 4.00 A.M.

Ration Formulation:

The different stages of birds were required different nutritional status in the ration. For this reason different types of rations were supplied at different stages of birds. In KEARI poultry farm feed was supplied to birds from their own feed mill.

Table 4: Feed specification for classic females and males –

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Feed | Starter  0-5 wks | Grower  6-23 wks | Breeder  24-64 wks | \*Breeder Hot climate | Male  In production |
| ME (Kcal/Kg) | 2750-2800 | 2650-2700 | 2700-2750 | 2750-2800 | 2650-2700 |
| Crude protein (%) | 18-20 | 15-16 | 15-16 | 16-17 | 13-14 |
| Calcium (%) | 0.9-1.1 | 0.90-1.10 | 3.00-3.20 | 3.00-3.30 | 0.90-1.10 |
| Av. Phosphorus (%) | 0.45-0.5 | 0.40-0.45 | 0.38-0.40 | 0.40-0.45 | 0.40-0.45 |

Table 5: Nutritional composition rations that are supplied in the farm-

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

Table 6: Daily feed supplied for per male and female birds

**At Sarter period:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | |  | |  | |
| Age in week | Program  followed | | Males (gm/ birds) | | Females (gm/ birds) | |
| **Recommended** | **Supplied** | **Recommended** | Supplied |
| 1 | 7/0\* | | Ad Lib. | 17.58 | Ad Lib. | 17.70 |
| 2 | 7/0 | | Ad Lib. | 48.93 | Ad Lib. | 38.56 |
| 3 | 7/0 | | 35 | 59.34 | 33 | 39.96 |
| 4 | 7/0 | | 42 | 59.96 | 39 | 44.28 |
| 5 | 7/0 | | 48 | 60.16 | 44 | 45.50 |
| 6 | 7/0 | | 52 | 62.46 | 48 | 47.32 |
| \* No fasting in the week and feed supplied for seven days of the week.  At grower period: | | | | | | |
| 7-8 | | 6/1\*\* | 56-61 | 62.22 | 51-55 | 50 |
| 9-10 | | 6/1 | 65-70 | 64-67 | 54-57 | 51 |
| 10-12 | | 6/1 | 70-77 | 67-71 | 60-65 | 55-65 |
| 13-15 | | 5/2\*\*\* | 80-85 | 72-80 | 70-75 | 70-78 |
| 16 | | 4/3\*\*\*\* | 87 | 84.22 | 80 | 81.11 |
| 17 | | 4/3 | 90 | 92.10 | 84 | 85.97 |
| 18 | | 4/3 | 95 | 102.8 | 89 | 93.29 |
| \*\* 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.  \*\*\*\*Three days fasting in a week and feed supplied for four days of the week.  At Breeding period: | | | | | | |
| 25-40 | | 7/0 | 125-150 | 130 - 135 | 122-140 | 136-178 |
| 40-60 | | 7/0 | 125-150 | 131-150 | 122-140 | 168-172 |

Management during Grower Period:

After 6th weeks of age and then up to 23th 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 KEARI Poultry Farm. This is done for proper feed utilization and maximum uniformity of the flock. At the age of 7th to 12th weeks 6/1 program of feeding was practiced i.e. one day fasting in a week; at the age of 13th 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 spectrum 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. Levamisole 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. It is done by taking body weight of 5% birds in a pen. Uniformity of a flock denotes the state of management and production of the farm. Uniformity calculate by-

No. of birds at ± 10 % of average body weight

Uniformity %= ×100

No. of total birds weighed

Breeder Management:

Male was exposed to females at the age of 23st weeks. KEARI Poultry Farm was followed the 10:1 (one male in ten female birds) ratio. Following this ratio they mixed up the total males of a flock in two phases. At the age of 23st week’s first mix up was done, in this stage half of the total calculated males were mixed with females. Remaining half males were mixed at the age of 25th weeks.

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. 14 birds per round feeder and 6 birds per nipple waterer space were supplied in the farm.

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 stored. 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 six birds for per nest box. In the nest box plastic pad and rice husk were used as bedding materials. This plastic pad was washed regularly at the interval of 15 days and rice husk was changed at seven days interval.

First egg was laid at the age of 25th weeks of age and peak production at the age of 32nd 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 yolk, 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 with H2O2 (2-5 %) 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.

Colibacillosis was a common disease in the breeder shed, but incidences of other disease were low. Other diseases were mycoplasmosis, coccidiosis, worm infestation, fatty liver syndrome, bumble foot, heat stress etc.

**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 KEARI Poultry Farm following lighting schedule was followed-

Table 7: Lighting schedule followed in the farm –

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Age  (weeks) | Duration of Light  ( Standard ) | Duration of Light  ( Followed ) | Intensity of Light ( lux )  Standard | Intensity of Light ( lux ) Followed |
| 1 | 20-18 hr | 24 hr | 60 | 20-40 |
| 2 | 16hr | 16 hr | 30 | 10-20 |
| 3 | 14 hr | 14 hr | 10 | 5-10 |
| 4-6 | 10 hr | 12 hr | 5 | 10 |
| 7 to20 | 12 hr | 12 hr | 5 | 10 |
| 21 to23 | 14-15 hr | 14 hr | 40 | 45 |
| 24 to end of the flock | 16 hr | 16 hr | 40 | 75 |

During brooding period up to 10th to 15th 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 and 30 minutes 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 and continued so on till end of the production.

3.5.2. Reproductive performance:

A breeder flock is mainly reared for reproduction, which means the production of chicks from the eggs laid by birds of the breeder flock. The reproductive performance of breeder flock can be measured by estimating the hatchability performance of the breeder flock. After production of eggs the hatchability performance mainly depends upon the hatchery management. Although the fertility causes a great impact on the hatchability performance but management of hatchery has a vital ruling upon the production of healthy (Grade A) chicks.

3.5.2.1. 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, Suffex®, H2O2 and detergent. After washing setting & hatching treys were dried in the Sun light and fitted in the incubator. Before egg loading in setter and transferring in hatcher a 2X strength fumigation was done for 30 minutes. Eggs were sated in setter machine twice in a week. Each trey had provision for setting 180 eggs. This operation done during night, 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 three 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 after candling of eggs. Candling of eggs was done manually in a dark room in front of hatcher machine. With the help of candling infertile and brusted eggs were removed and hatchable eggs were transferred to hatching treys. Then these treys were loaded in the 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. Chicks were treated with a solution of dextrose, gentamycin and Biconex® (dextrose 18ml, gentamycin 10% 2ml and biconvex 1ml for per 100 chicks). All hatchery waste was gathered in drums as quick as possible and then all buried in the earth.

Table 8:Temperature and humidity maintained in different types of incubator of KEARI Poultry Hatchery.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Season** | **Particulars** | | **Linco** | **Diamond** |
| Summer | Temperature  (°F) | Setter | 99.5 | 98.5 |
| Hatcher | 98.5 | 98.2 |
| Relative Humidity (%) | Setter | 86.5 | 86.5 |
| Hatcher | 87.8-88.0 | 87.8-88.0 |
| Winter | Temperature  (°F) | Setter | 99.8 | 98.8 |
| Hatcher | 98.8 | 98.5 |
| Relative Humidity (%) | Setter | 86.5 | 86.5 |
| Hatcher | 87.8 | 88.0 |

Detection of any fault in incubator:

Detection of any fault in incubator is accomplished by the following technique:-

.i) Firstly average egg weight was taken before loading in the setter (Loading wt).

ii) Further average egg weight is taken before transporting eggs from setter to hatcher (Transferring w-t.).

iii) The result was obtained by the following way:­-

Loading wt. - Transferring weight

Weight loss = × 100

Loading weight

iv. Interpretation:

a. If weight loss is in between 10-12 %. then there is no defect in machine.

b. If weight loss is less than 9%\_ then temperature and humidity fall from the standard

level.

c. If weight loss is more than 12.5%. then temperature and humidity raise from the standard level.

**Formula used:**

Total hatch

⓿ Hatchability % =

Total egg set

⓿ Total egg set= Total egg production- Discarded egg during grading.

⓿ Numbers of Chick Production= Total hatch- (Loss due to bursting of infertile eggs, embryonic death from 0 to 18 days+ Hatching loss In 18 to 21 days).

**CHAPTER-IV**

**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 60th weeks showed in the table (9)

Table 9: 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) |
| 1-6 | 392 | 417 | 508 | 483 |
| 7-12 | 1016 | 1020 | 1510 | 1452 |
| 13-18 | 1625 | 1630 | 2225 | 2245 |
| 19-24 | 2436 | 2526 | 3090 | 3124 |
| 25-30 | 3243 | 3263 | 3780 | 3827 |
| 31-36 | 3515 | 3593 | 3971 | 4001 |
| 37-42 | 3620 | 3630 | 4149 | 4174 |
| 43-48 | 3705 | 3711 | 4297 | 4312 |
| 49-54 | 3796 | 3796 | 4466 | 4471 |
| 55-60 | 3794 | 3824 | 4569 | 4533 |

From table (11), it is clearly indicated that achieved body weight was always higher in female birds and the difference was greater after 25-30th weeks of age. In female at 1-6th weeks of age the target and achieved body weight was 392 and 417 gm respectively at 31-36th weeks of age it was 3515 and 3593 gm respectively and at 55-60th weeks of age it was 3794 and 3824 gm respectively. On the other hand, in male birds achieved body weight were maximum times higher than the targeted one but sometimes lower (at 7-12th weeks of age target and achieved body weight was 1510 and 1452 respectively and at 55-60th weeks of age 4569 and 4533 gm respectively). 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 (10)

Table10: Uniformity observed in the broiler breeder flock –

|  |  |  |
| --- | --- | --- |
| Age  (Wks) | Uniformity | |
| **Females (%)** | Males ( % ) |
| 1-6 | 78.17 | 84.08 |
| 7-12 | 73 | 65.67 |
| 13-18 | 72.83 | 56.67 |
| 19-24 | 89.33 | 75.5 |
| 25-30 | 84.5 | 72.17 |
| 31-36 | 76.83 | 64.83 |
| 37-42 | 71 | 51.67 |
| 43-48 | 70 | 68.5 |
| 49-54 | 64.5 | 66.5 |
| 55-60 | 63.83 | 67.67 |

The table (10) shows that uniformity of the flock was fluctuated throughout the rearing period. Uniformity of female birds was always higher than 60% and at the age of 1-6th, 55-60th weeks was 78.17%, 63.83% respectively. On the other side, in male birds it was higher than 50% and at the age of 1-6th, 55-60th weeks was 84.08%, 67.67% respectively. Uniformity in female was higher at the age of 19-24th weeks and lower at the age of 55-60th weeks was 89.33 and 63.83 respectively. In male it was higher at 1-6th weeks of age and lower at 37-42nd weeks of age was 84.08 and 51.67 respectively. In comparison uniformity of female birds was maximum times higher.

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



Graph-1: Uniformity of the male and female birds.

From above graph (1), uniformity of female birds was higher at 7-48th weeks than male birds and lower at 1-6th & 49-60th weeks than male birds.

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

Hen day egg production of the breeder broiler parent stock birds from 25th week to 60th weeks shown in the table (11)

Table 11: Hen day egg production of the broiler breeder flock-

|  |  |  |
| --- | --- | --- |
| Age  (wks) | Hen day egg production | |
| **Standard**  **(%)** | Achieved  (%) |
| 25-30 | 53.73 | 42.28 |
| 31-36 | 85.85 | 82.14 |
| 37-42 | 79.08 | 74.99 |
| 43-48 | 72.93 | 68.96 |
| 49-54 | 66.45 | 62.81 |
| 55-60 | 64.92 | 62.43 |

Above table (11) shown that achieved hen day egg production was always lower than the standard specification and sometimes it was significantly lowered than the standard one. In first 1-6th weeks of production standard and achieved hen day egg production was 53.73% and 42.28% and the difference was 11.45%. The peak production was achieved at the age of 31-36th (31nd) weeks of age & it was 82.14%. At 37-42nd weeks of age standard and achieved hen day egg production was 79.08% and 74.99% and at 55-60th weeks of age standard and achieved hen day egg production was 64.92% and 62.43% respectively.

Along with this table the above hen day egg production of broiler parent stock is shown graphically in the following graph (2).

Graph-2: Hen day egg production

**Age(weeks)**

**Prodution (%)**

The graph (2) has shown that achieved hen day egg production was always lower than the standard and sometimes it was significantly lowered than the standard one. The peak production was achieved at the age of 31nd weeks of age but it was not satisfactory due to sudden fall of production because of Mycoplasmosis infection in the flock.

4.4. Hatchability performances of breeder farm:

The hatchability performances of eggs in the broiler breeder flock from 25th – 60th weeks of age shown in the table (12)

Table 12: Hatchability performances of the broiler breeder flock-

|  |  |  |
| --- | --- | --- |
| Age  (wks) | Hatchability | |
| **Standard**  **(%)** | Achieved  (%) |
| 25-30 | 82 | 47 |
| 31-36 | 90 | 83.33 |
| 37-42 | 89.5 | 77.83 |
| 43-48 | 88 | 68.67 |
| 49-54 | 85.6 | 58.83 |
| 55-60 | 82 | 51 |

The above table (12) has shown that actual hatchability was always significantly lower than the standard hatchability. The difference between targeted and achived hatchability performance of Flock-34 can be shown in the following graph (3) more precisely.

**Hatchibility (%)**

**Age(weeks)**

Graph-3: Hatchibility performance

**CHAPTER-V**

**CONCLUSION**

The main features found from this study were exotic broiler parent stock breeder birds could be reared successfully in open sided house system in climate condition of Bangladesh. The body weight gain, feed consumption, hen day & hatching egg production, hatchability of the eggs were close to the specified standard of “COBB 500 BREEDER MANAGEMENT GUIDE”. The rearing period of (0-20th weeks) brooding and grower stage is very important to get maximum production performances from the birds. The main point of rearing period is the body weight gain and it should maintain carefully according to the standard for better production performances. During brooding period temperature was maintained through gas brooder and birds were reared on litter floored shed. Rice husk was used as litter material. All vaccination was done at morning or evening. For better management, birds were supplied the feed from their own feed mill. During grower period restricted feeding was practiced for proper utilization of feed and better uniformity of the flock. At breeding stage males were mixed up with female birds at the 10:1 (female: male) ratio and it done at the age of 22nd to 23rd weeks age. Nest boxes were provided in the shed at 23rd weeks of age. First egg was appeared at 24th weeks of age. Eggs were collected from the shed for several times in a day especially at 11am. After collection of eggs, they were graded, fumigated and transferred to the hatchery. In the hatchery eggs were stored for 2-3days in cold storage room. Eggs were loaded in setter machine for two times in a week. At 18th days of incubation eggs were candled and transferred in to the Hatcher machine. Chicks were hatch out at 21st days of incubation. Hatched chicks were graded in to three grades A, B and C. After grading chicks were treated and packaged. Feed supplied in the according to the breeder manual and present status of the birds. Body weight was achieved by the birds were always higher than the targeted weight. Uniformity of the flock was satisfactory and was about 80% throughout the rearing period. Achieved hatchability of eggs was significantly lowered than the standard one and was above 80%. 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.

**REFERENCES**

1. FARM POULTRY AND LIVESTOCK SURVEY 2007-08 (Published on November 2010), Bangladesh Bureau of Statistics, Ministry of Planning, Dhaka, Bangladesh. PP: 17
2. G.T. Tabler and R.K. Bramwell (2003). Maximizing performance during hot weather, International poultry production, Vol. II
3. Chowdhury, S.D, Das C, Pramanik, H.A.M Roy, C.R, and Shaha.K.S(2003).Broiler parent stock production in Bangladesh : It is possible to achieve target body weight and acceptable uniformity in open sided housed? Proc.3rd WPSA International Poultry Show and Seminar PP: 15-23.
4. Cobb 500 Breeder management guide 2013.
5. Elibol Okan (2003) . The effect of storage and pre-warming periods on hatch time and hatchability. International hatchery Practice. 17(4):17
6. Fattah , K.A. (2003) Poverty alleviation and poultry development strategies in Bangladesh, Proceeding of the first annual Scientific conference 22-24 February 2003, Chittagong Government Veterinary college, University of Chittagong, PP: 192-200.
7. Garrison Jerry (2002). A practical look at general hatchery management. International Hatchery Practice .16(7):13-15
8. Garrison, J. (2002). A practical book at general hatchery management. International hatchery practice. 16(7): 13-15.
9. Hall Edmud's (2002). Effects of egg storage time on spread of hatch, chick quality and growth, International Hatchery Practice 17(2):17-21
10. Haque, Q.M.E. (2001) Poultry industry in Bangladesh and strategies for its improvement 2 "d international poultry show and seminar. 16:15-24
11. Hill Donna (2002) Performance losses: incubation and brooding .International Hatchery Practice .16(8):15-16.
12. Hurwitz, S and Plavanik, I (1998). Severe feed restriction in pullets during the early growing period: performance and relationship among age, body weight and egg weight at the onset of production, poultry science 68(7): 914-924.
13. Krishnappa, P, Devagowda, G.R and Ramappa, B.S (1992) Effect of restricted feeding on subsequent performance of broiler breeder dams. Indian Journal of poultry Science 27:1, 29-3 l.
14. Onagbesan, O. and Tona , K. (2005) effects of turning duration during incubation on embryo growth International Hatchery Practice 19(4):18 Robinson, FE and Wilson, J.L. (1999), Reproductive failure in over weight males and females broiler breeder. Animal feed science and technology .58:145-150.
15. Robinson, FE, R.A.Renama, J.J.R feddes, M.J Zuidhof and Wilson J.L (1999) Egg production and fertility traits of broiler breeder hens as influenced by strain and early feed allocation. Poultry science (Supp 11) 17.
16. Saleque, M.A (2001). Poultry as a tool in poverty alleviation: A special programme for the rural poor in Bangladesh, proc. 2°d WPSA International poultry show and seminar.PP: 66-69.
17. Singh, B. Singh, H. Singh, C. V (2000) Genetic parameter of growth egg production and quality trials in WLH. Indian Journal Poultry Science .35:13-16
18. Tona, K and Bamelis, F. (2002) Effects of egg storage on spread of hatch, chick quality and growth. International Hatchery Practice 17(2):17.
19. G. Tom Tabler, Frank T. Jones and Walter G. Bottje, University of Arkansas Division of Agriculture (2008) Energy Use and Costs at the Applied Broiler Research Farm, Volume 10 No. 1
20. Alejandro Salazar, Samarendu Mohanty and Jaime Malaga, Department of Agricultural and Applied Economics, Texas Tech University, USA (2005) 2025 Vision for Mexican Chicken Consumption, International Journal of Poultry Science 4 (5): 292-295, 2005
21. P.A. Ekunwe, O.O. Soniregun and J.O. Oyedeji, Department of Agriculture, Benson Idahosa University, Benin City, Nigeria (2006) Economics of Small Scale Deep Litter System of Egg Production in Oredo Local Government Area of Edo State, Nigeria, International Journal of Poultry Science 5 (1): 81-83, 2006
22. Colin C. Whitehead (2010) Nutritional Influences on hatching Eggs, International Hatchery Practice — Volume 21 Number 4
23. [www.thepoultrysite.com/articles/166/care-and-incubation-of-hatching-eggs](http://www.thepoultrysite.com/articles/166/care-and-incubation-of-hatching-eggs), Accessed on 2ndth January, 2014 at 9.30pm
24. [www.google.com/search?q=chicken++population+&sitesearch=http%3A%2F%2Fwww.dls.gov.bd](http://www.google.com/search?q=chicken++population+&sitesearch=http%3A%2F%2Fwww.dls.gov.bd), Accessed on 30th December, 2013 at 10.00 am