

## PERFORMANCE OF COLOURED BROILER IN HOT AND HUMID CLIMATIC CONDITION

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**Abstract:** An experiment was conducted for six weeks to investigate the growth performance, feed conversion ratio and carcass characteristics of coloured broiler chicken on hot and humid region of Odisha. Two types of diets were formulated, one was starter and other was finisher. The six replicate groups were taken, having 40 birds in each group for this experiment and the diet was fed for different groups of coloured broiler up to 6<sup>th</sup> weeks of age. Carcass traits were evaluated after 6<sup>th</sup> week of age by random selection of 10 birds from each replicate group. At 6<sup>th</sup> week of age body weight were observed as 1458 to 1509 g in 1<sup>st</sup> and 5<sup>th</sup> group respectively. FCR were found as 2.04, 2.12, 2.08, 2.18, 2.2 and 2.14 in R1, R2, R3, R4, R5 and R6 groups respectively. In carcass traits live weight (g), bleed weight (g), defeathered weight (g), eviscerated weight (g), dressed yield (%) and abdominal fat (%) ranged from 1467-1503, 96.2-99.4, 90.0-91.7, 65.9-67.1, 70.6-71.4 and 1.63-1.88, respectively among different replicate groups. The study shown that the overall growth performance and carcass traits of Coloured broilers has better performance in hot and humid climatic condition of Odisha.

**Keywords:** Colour broiler, Hot and Humid condition, Performance, Carcass traits.

### Introduction

The poultry industry has emerged as the most dynamic and fast expanding segment with an annual growth rate at about 6 % in egg and 10% in broiler production, contributing nearly 0.77% to the national GDP. Broilers are major source of poultry meat which is best source of high quality protein with least fat as they are the most efficient converters of feedstuffs to protein. Broilers are raised solely for meat purpose, up to six weeks of age. The genetic and nutritional improvements have greatly increased growth rate, improved feed efficiency, and increased breast yield, as well as many other production traits in broiler chickens. Performance of broilers varies according to agro climatic zones in different regions. In broiler production's many improvements would not have been possible without major improvements in nutrition. In India most of population are densified in rural area where they have large demand for coloured chicken. From few decades coloured birds taken wide coverage on rural area, and have remained predominant in the developing world (FAO, 2004;

Do, 2005; Bett et al., 2012) despite the introduction of exotic strains. but they have poor growth performance and FCR. Now a day's market of colour broilers take over white birds. The high demand of colour broiler is due to similar plumage color like desi birds. For rural farmers, indigenous chickens serve as an important source of protein and cash income (Olwande *et al.* 2010).Olwande P O, Ogara W O, Okuthe S O, Muchemi G, Okoth E, Odindo M O and Adhiambo R F. 2010. The bird's performance is depending upon the breeds, nutritional status and environment condition. In our study we have taken the best nutritional practice and evaluate the performance of color birds in hot and humid condition.

### **Materials and Methods**

All the procedures and experimental protocol have been conducted in accordance with the guidelines laid down by the Institutional Ethics Committee. The experiment was conducted at the Department of Poultry Science, College of Veterinary Science and Animal Husbandry, Orissa University of Agriculture and Technology, Bhubaneswar. A total of 240 broiler chicks of same hatch with uniform weight were used in the experiment. The birds were housed in battery brooder cages with watering and feeding facilities and were reared under standard managerial conditions up to 6 weeks of age. Diets were formulated as per recommendation of BIS (1992) and same starter and finisher diet were fed to birds from 0 to 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> weeks with ad libitum drinking water. The nutrient composition of broiler starter and finisher diet have been shown in table 1. For the present experiment there were 6 replicates groups and, in each replicate 40 birds were randomly distributed. Weekly body weight, body weight gain, feed intake were recorded and FCR were calculated from 0 to 6 weeks. For evaluation of carcass traits at the end of 6<sup>th</sup> week of experiment 10 birds from each group were randomly selected and slaughtered after 12 hours of fasting with ad libitum drinking water. Data were analyzed by ANOVA using SPSS software version 16.

**Table 1:** Ingredients and Nutrient composition of broiler starter and finisher diets

|                                      | Ingredients (%) |      |          |     |           |     |             |               |        |             |             |            |                  |              |
|--------------------------------------|-----------------|------|----------|-----|-----------|-----|-------------|---------------|--------|-------------|-------------|------------|------------------|--------------|
|                                      | Maize           | DORB | Soyabean | Oil | Limestone | DCP | Salt        | DL-Methionine | lysine | TM. Premix1 | Vit Premix2 | B. complex | Choline Chloride | Toxin binder |
| Broiler Starter                      | 54.8            | 0.5  | 40.0     | 1.3 | 0.8       | 1.8 | 0.3         | 0.13          | 0.10   | 0.10        | 0.15        | 0.015      | 0.05             | 0.05         |
| Broiler Finisher                     | 61.3            | 1.1  | 32.1     | 1.9 | 1.2       | 1.5 | 0.3         | 0.13          | 0.10   | 0.10        | 0.15        | 0.015      | 0.05             | 0.05         |
| <b>Nutrient Composition of Diets</b> |                 |      |          |     |           |     |             |               |        |             |             |            |                  |              |
|                                      | Crude Protein   |      | M Energy |     | Calcium   |     | Available P |               | Lysine |             | Methionine  |            |                  |              |
|                                      | 22.97           |      | 2914     |     | 1.0       |     | 0.5         |               | 1.28   |             | 0.49        |            |                  |              |
|                                      | 20.12           |      | 3002     |     | 1.0       |     | 0.4         |               | 1.10   |             | 0.46        |            |                  |              |

1 Trace mineral mixture each (100g) contains: FeSO<sub>4</sub>.7H<sub>2</sub>O-8g, ZnSO<sub>4</sub>.7H<sub>2</sub>O-10g, MnSO<sub>4</sub>.H<sub>2</sub>O- 10g, CuSO<sub>4</sub>.5H<sub>2</sub>O-1g, KI- 30 g

2 Vitamin premix (each gram) contains: Vitamin A-82.5 IU, Vitamin B2-50mg, Vitamin D3-12000 unit, Vitamin K-10mg.

3 Vitamin B complex (each gram) contains Vitamin B1- 8 mg, Vitamin B6-16mg, VitaminB12-80mcg, Niacin -120 mg, Calcium panthotheonate-80 mg , Vitamin E 50% 160 mg, L-lysine-10 mg and DL- Methionine- 10 mg

## Result and Discussion

The result of present study pertaining to progressive body weight, body weight gain, FCR are presented in table 2. Results have shown that at the end of 6<sup>th</sup> week body weight were ranges from 1458 to 1509 g in 1<sup>st</sup> and 5<sup>th</sup> group respectively. Body weight gain (g) were found as 59-83, 132-162, 243-291, 229-277, 294-355 and 359-406 in 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> week respectively. FCR of coloured broiler in present study were found as 2.04, 2.12, 2.08, 2.18, 2.2 and 2.14 in replicates groups R1, R2, R3, R4, R5 and R6 respectively. Similar to our finding the body weight and FCR of colour birds in different densities diets with constant calorie protein ratio (Kumar et.al 2013), In contrast to present findings Kundu et al. (2015) reported lower body weight and higher FCR at 1 month of age in Vanaraja and Nicobari fowls in hot and humid climate of Andaman and Nicobar Islands. Similarly Baba et al. (2014) also found lower body weight gain from 2<sup>nd</sup> to 6<sup>th</sup> week and higher FCR at 6<sup>th</sup> week of age in Vanaraja birds reared under intensive and semi intensive (backyard) system. Similar to present finding Wang et al. (2009) reported comparable body weight at 35 days of age in slow growing chicken whereas reported higher FCR in free range rearing.

Haunshi et al. (2009) reported lower body weight from 0 day to 6<sup>th</sup> week of age and higher FCR (8<sup>th</sup> week) in Miri type chicken, Grampriya and Vanaraja birds. The growth performance of birds are depending on breed, nutritional status, management and environmental condition like temperature and humidity.

**Table 2:** Growth Performance Parameter of colour broiler

|        | Body Weight (g) |        |        |        |        |        |        | Body Weight Gain |        |        |        |        |        | 0-6 Wk          |                  |       |
|--------|-----------------|--------|--------|--------|--------|--------|--------|------------------|--------|--------|--------|--------|--------|-----------------|------------------|-------|
|        | Day old         | 1st wk | 2nd wk | 3rd wk | 4th wk | 5th wk | 6th wk | 1st wk           | 2nd wk | 3rd wk | 4th wk | 5th wk | 6th wk | Feed Intake (g) | Body Weight Gain | FCR   |
| R1     | 42.8            | 109    | 241    | 512    | 741    | 1096   | 1458   | 66               | 132    | 271    | 229    | 355    | 362    | 2887            | 1415             | 2.04  |
| R2     | 42.0            | 101    | 253    | 544    | 789    | 1083   | 1477   | 59               | 152    | 291    | 245    | 294    | 394    | 3042            | 1435             | 2.12  |
| R3     | 41.9            | 115    | 277    | 520    | 757    | 1100   | 1459   | 73               | 162    | 243    | 237    | 343    | 359    | 2947            | 1417             | 2.08  |
| R4     | 42.5            | 120    | 258    | 508    | 749    | 1092   | 1493   | 77               | 138    | 250    | 241    | 343    | 401    | 3162            | 1451             | 2.18  |
| R5     | 43.0            | 126    | 262    | 523    | 800    | 1103   | 1509   | 83               | 136    | 261    | 277    | 303    | 406    | 3225            | 1466             | 2.2   |
| R6     | 42.7            | 106    | 246    | 535    | 776    | 1077   | 1481   | 63               | 140    | 289    | 241    | 301    | 404    | 3078            | 1438             | 2.14  |
| Pooled | 0.362           | 2.65   | 5.77   | 8.54   | 12.63  | 15.27  | 16.43  | 1.02             | 2.13   | 4.32   | 4.54   | 2.04   | 5.43   | 19.63           | 13.69            | 0.054 |
| SEM    |                 |        |        |        |        |        |        |                  |        |        |        |        |        |                 |                  |       |

Values bearing different superscripts within the column differ significantly ( $p < 0.05$ )

**Table 3:** Carcass traits of colour broiler

| Replicates groups | Live weight | Bleed weight | Defeathered weight | Eviscerated weight | Dressed yield | Abdominal fat | Drum stick | Breast | Thigh | Back  | Wing  | Neck  |
|-------------------|-------------|--------------|--------------------|--------------------|---------------|---------------|------------|--------|-------|-------|-------|-------|
| R1                | 1489        | 97.1         | 90.0               | 66.6               | 71.3          | 1.63          | 9.71       | 15.62  | 9.56  | 15.00 | 8.16  | 3.81  |
| R2                | 1503        | 97.7         | 91.2               | 65.9               | 71.4          | 1.72          | 9.14       | 16.58  | 9.79  | 16.51 | 8.14  | 3.64  |
| R3                | 1467        | 96.2         | 92.0               | 67.1               | 70.6          | 1.67          | 8.75       | 15.76  | 9.74  | 15.40 | 8.42  | 3.47  |
| R4                | 1493        | 97.4         | 90.8               | 66.5               | 71.2          | 1.79          | 8.96       | 16.57  | 9.25  | 15.67 | 8.07  | 3.61  |
| R5                | 1499        | 99.4         | 91.7               | 66.8               | 70.8          | 1.81          | 9.15       | 16.25  | 10.08 | 16.10 | 8.66  | 3.92  |
| R6                | 1481        | 96.8         | 91.5               | 66.2               | 71.2          | 1.88          | 9.18       | 15.86  | 9.86  | 15.41 | 7.79  | 3.90  |
| Pooled            | 8.69        | 0.142        | 0.157              | 0.421              | 0.582         | 0.076         | 0.116      | 0.086  | 0.041 | 0.121 | 0.073 | 0.092 |
| SEM               |             |              |                    |                    |               |               |            |        |       |       |       |       |

Values bearing different superscripts within the column differ significantly ( $p < 0.05$ )

The result pertaining to various carcass traits of Coloured broiler is given in table 3. Result revealed that live weight (g), bleed weight (%), defeathered weight (%), eviscerated weight (%), dressed yield (%) and abdominal fat (%) were ranged from 1467-1503, 96.2-99.4, 90.0-91.7, 65.9-67.1, 70.6-71.4 and 1.63-1.88 respectively among different replicate groups. Results pertaining to cut up parts of dressed carcass were obtained as 8.75-9.71 (%), 15.62-16.58(%), 9.25-10.08(%), 15.0-16.51(%), 7.79-8.07(%) and 3.47-3.92(%) respectively for drum stick, breast, thigh, back, wing and neck. Similar to our finding higher percentage of Eviscerated yield, breast yield, thigh yield, wing yield and abdominal fat were observed by Wang et al. (2009) in slow growing chicken. The present experiment was concluded that the colour broiler archived optimum growth performance in hot and humid condition with best nutritional practices.

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