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## Performance and blood biochemical studies of Daothigir Breed of chicken under intensive system of management in Assam

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### Abstract

An experiment was conducted to evaluate the performance and blood biochemical parameters of Daothigir birds under intensive system of management. A total of 300 number of day-old chicks were reared in the farm premises of AICRP on poultry breeding Khanapara, under deep litter system of management with standard managerial practice. Blood biochemical parameters were recorded as Total protein (g/dL)  $3.49 \pm 0.19$ , serum cholesterol (mg/dL)  $77.25 \pm 8.78$ , serum bilirubin (mg/dL)  $23.59 \pm 3.12$ , SGOT (IU/L)  $221.76 \pm 15.24$ , SGPT (IU/L)  $7.43 \pm 1.05$ , serum calcium (mg/dL)  $7.98 \pm 0.86$ , serum phosphorous (mg/dL)  $5.59 \pm 0.58$ , blood glucose (mg/dL)  $158.23 \pm 9.78$ . The different performance traits measured were body weight of the birds at day old, 5<sup>th</sup> week, 20<sup>th</sup> week, 40<sup>th</sup> week and 52<sup>th</sup> week of age. Conformation traits and FCR at 5<sup>th</sup> week of age, age at maturity, egg weight at 32<sup>nd</sup>, 42<sup>nd</sup>, 52<sup>nd</sup>, 72<sup>nd</sup> weeks of age, egg production upto 40<sup>th</sup>, 52<sup>nd</sup> and 72<sup>nd</sup> week, fertility and hatchability of egg, carcass characteristics and egg quality. Body weight at day old of combined sex was recorded as  $26.25 \pm 1.21$  g. Daothigir chicken gained  $1031.49 \pm 98.43$  g body weight at 20<sup>th</sup> week of age. The Feed Conversion Ratio, breast Angle, shank length and keel length recorded at 5<sup>th</sup> week of age were 3.15,  $42.10^\circ$ ,  $6.16 \pm 0.79$  cm and  $5.98 \pm 0.84$  cm respectively. At the end of 72<sup>nd</sup> week the egg production was recorded as  $121.59 \pm 10.67$  numbers. Albumen index, yolk index and haugh units recorded at the end of 72<sup>nd</sup> week in the present study were  $3.71 \pm 0.59$ ,  $0.47 \pm 0.09$  and  $80.24 \pm 5.12$  respectively. The dressing and giblet percentage for both male and female recorded in the present study are  $71.81 \pm 3.45$ ,  $70.29 \pm 5.19$  and  $5.13 \pm 0.38$ ,  $4.86 \pm 0.74$  respectively. Therefore, it can be concluded that Daothigir has the production potential for higher production which needs to be exploited through selection, feed supplementation, creating awareness among the farmers. The results of the study will be helpful for accurate interpretation of biochemical tests of the indigenous poultry breeds.

**Keywords:** Daothigir, intensive system, performance, egg quality, Conformation traits, blood biochemical parameters

### Introduction

Biochemical tests haven't widely applied for diagnosis of avian medicine, but these tests could be a suitable diagnostic instrument for monitoring health for chicken responses to therapeutic regimens and giving a prognosis to some of the poultry diseases. Backyard poultry is based on conventional practices with little or no dependence on external inputs, which serves as a livelihood security and low-cost animal protein source to the farmers. Indigenous breeds are comparatively disease resistant and well adaptive to the agro climatic condition of its place of origin. Daothigir is one of the 19 registered breeds of chicken in India, estimated population of Daothigir breed in the entire BTC region was around 14000 in the year 2005. (NBAGR). This breed is found in the district of Kokrajhar, Chirang, Udalguri and Baska in Assam, reared mainly by the local Bodo tribes under backyard or free-range system of rearing. It is small sized compact but heavy bodied with black interspersed with white feathers, striped and spotted pattern. There is very limited information available for this breed of bird in respect of different traits as population and distribution is limited to few pockets of Assam. Keeping in view of these facts this study has been undertaken to study various blood biochemical and performance traits of Daothigir birds under intensive system of management.

### Materials and Methods

**Location of the study:** The experiment was conducted under the project "AICRP on poultry breeding" Directorate of research (Vet.), Assam Agricultural University, Khanapara, Guwahati-22.

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**Selection of the experimental birds:** A total of 300 number of day-old chicks were procured from the hatchery of AICRP on poultry breeding and reared in the farm premises in deep litter system of management with standard managerial practice. All the birds are vaccinated and dewormed as per the standard schedule. The different traits measured were body weight of the birds at day old, 5<sup>th</sup> week, 20<sup>th</sup> week, 40<sup>th</sup> week and 52<sup>nd</sup> week of age. Conformation traits at 5<sup>th</sup> week of age, FCR at 5<sup>th</sup> week of age, age at maturity, egg weight at 32<sup>nd</sup>, 42<sup>nd</sup>, 52<sup>nd</sup>, 72<sup>nd</sup> weeks of age, egg production up to 40<sup>th</sup>, 52<sup>nd</sup> and 72<sup>nd</sup> week, fertility and hatchability of egg over the period of time, carcass characteristics and egg quality.

For determination of blood biochemical parameters including total protein, serum glutamic oxaloacetic transaminase (SGOT), serum glutamic-pyruvic transaminase (SGPT), calcium, phosphorous, glucose, cholesterol blood was

collected 20 weeks of age and were determined by semi auto biochemical analyzer by using standard diagnostic kits. For determination of carcass characteristics at 20 weeks of age 20 no of birds of both sexes were selected at random and slaughtered scientifically. For determination of egg quality traits 50 numbers of egg at different age were collected and various parameter were recorded.

Data analysis: All the data obtain were analyzed statistically as per the method describe by snedecor and Cochran (1994).

## Results and Discussion

Blood biochemical parameters were presented in the table No:1 is comparable to Simarks *et al.* (2004)<sup>[9]</sup>, who studied the serum cholesterol content in Thai indigenous chickens and Bora *et al.* (2017)<sup>[11]</sup> who reported similar findings in Aseel, Kadaknath and Rajasri breed of chicken.

**Table 1:** Blood biochemical Parameters

Blood biochemical Parameters	Value
Total protein (g/dL)	3.49±0.19
Serum cholesterol (mg/dL)	77.25±8.78
Serum bilirubin (mg/dL)	23.59±3.12
SGOT (IU/L)	221.76±15.24
SGPT (IU/L)	7.43±1.05
Serum calcium (mg/dL)	7.98±0.86
Serum phosphorous (mg/dL)	5.59±0.58
Blood glucose (mg/dL)	158.23±9.78

**Production performance:** Body weights at different ages are presented in table no 2 are comparable to Tantia *et al.* (2006) in Ankleswar breed, Pathak *et al.* (2015)<sup>[8]</sup> and Dalal *et al.*, (2022)<sup>[2]</sup>. The Feed Conversion Ratio (FCR) for the experimental birds was found to be 3.15 in this study.

**Table 2:** Body weights of Daothigir bird upto 52<sup>nd</sup> week of age

Age	Male	Female	Combined Sex
0 days	-	-	26.250±1.21
5 <sup>th</sup> week	268.51±2.79	196.90±2.76	232.59±3.15
20 <sup>th</sup> week	1123.71±98.92	959.80±77.54	1031.49±98.43
40 <sup>th</sup> week	1798.49±115.49	1610.22±112.56	1721.35±123.56
52 <sup>nd</sup> week	1910.45±136.59	1658.67±129.47	1797.27±128.72

**Conformation traits** the breast Angle, shank length and keel length recorded at 5<sup>th</sup> week of age in this study were found to be 42.10°, 6.16±0.79 cm and 5.98±0.84 cm respectively and can be compared to that of PB2x Indigenous chicken (Kalita *et al.* 2016)<sup>[6]</sup>.

**Egg production:** The average age at maturity was recorded as 167.35±8.64 in the present study. The egg production of the Daothigir birds were recorded upto 32<sup>nd</sup> week, 40<sup>th</sup> week, 52<sup>nd</sup> week and 72<sup>nd</sup> week of age are presented in the table No. 3. At the end of 72<sup>nd</sup> week the egg production was recorded as 123.86±7.39 numbers and it is comparable to that of Hunsu *et al.*, (2013)<sup>[4]</sup>

**Table 3:** Egg production, egg weight and egg quality of Daothigir birds

Age	Egg production up to	Egg weight at	Shape Index	Albumen Index	Yolk Index	Haugh unit	Shell thickness(mm)
32 weeks	-	32.10±3.10	-	-	-	-	-
40 weeks	42.10±2.16	33.80±3.94	72.46±3.54	3.10±0.59	0.47±0.09	81.12±2.46	0.35±0.03
52 weeks	71.93±5.49	35.39±4.10	72.38±2.43	3.18±0.67	0.48±0.11	83.46±4.21	0.35±0.06
72 weeks	123.86±7.39	36.51±4.21	73.23±3.16	3.64±0.81	0.50±0.13	84.14±4.33	0.33±0.07

**Egg quality:** No available literature on egg quality of Daothigir birds was found for comparison. The results of egg weight, shape Index, albumen Index, yolk Index, Haugh unit, shell thickness (mm) is presented in the Table 3.

Egg weight at 72<sup>nd</sup> week was 36.51±4.21g which was similar to that of Ankleswar breed (Vij *et al.* 2008)<sup>[13]</sup>. Shape index recorded at 72<sup>nd</sup> week of age was 73.23±3.16; however, shape index was numerically almost similar during different age under this study. Albumen index, yolk index and haugh units recorded up to of 72<sup>nd</sup> week in the present study were presented in table no.3 which are almost similar to that of Haringhata black (Tantia *et al.* 2006)<sup>[12]</sup> The eggshell was quite strong having average thickness of 0.35±0.05 mm.

**Reproductive trait** the fertility, hatchability on total egg set and hatchability on fertile egg set recorded in the present study as 91.20 ± 8.15, 67.47±6.31 and 82.98±5.67 respectively. The average age at sexual maturity was recorded as 165.30±7.40 in the present study.

**Carcass characteristics:** The average dressing percent and giblet percent for both male and female are presented in the Table No. 4.

However, giblet, liver, gizzard and heart percentage were higher in Kadaknath and Assel birds as compared to Daothigir in the present study (Haunshi S. *et al.*, 2011). The percent breast and back yield was found to be higher when compared to Aseel and Kadaknath breed of chicken at the age of 20<sup>th</sup>

week (Haunshi S. *et al.*, 2011) and Ekka P. (2018) [3]. Moreover, weight of the drumstick, thigh, Shank, neck, full wing, winglette, wingtip, wingdrumette and whole chicken leg were also recorded in the study.

**Table 5:** Carcass characteristics of Daothigir breed of chicken at 20<sup>th</sup> weeks of age

% Yield of cutup parts	Male	Female
Breast	22.12±2.16	26.56±3.21
Back	14.96±1.42	15.09±1.46
Drumstick	15.86±2.16	13.81±1.96
Thigh	19.72±2.34	15.17±2.16
Shank	3.84±0.67	4.12±0.81
Neck	7.34±0.65	6.14±1.24
Full wing	12.15±3.03	13.28±2.89
Winglette	3.42±0.83	4.16±1.41
Wingtip	2.13±0.46	1.39±0.31
Wingdrumette	4.64±1.23	6.75±1.16
whole chicken leg	34.72±4.61	28.46±3.17
Abdominal fat	1.01±0.23	1.05±0.21

Percent yield of different organ at 20<sup>th</sup> week of age are shown in Table. 6 (Tantia *et al.* 2006) [12]

**Table 6:** Yield (%) of relative organ of Daothigir breed of chicken

Yield of relative organ (%)	Male	Female
Liver	2.19±0.53	2.56±0.51
Heart	0.92±0.12	0.71±0.17
Gizzard	1.81±0.29	2.10±0.59
Head	5.25±0.71	4.59±0.72
Intestine	3.98±1.06	5.57±0.97
Kidney	0.43±0.06	0.49±0.08

## Summary

Daothigir is a dual type of backyard chicken breed found in Chirang, Udalguri and Baska districts of Assam. It has the production potential for higher production which needs to be exploited through selection, feed supplementation, creating awareness among the readers. The results of the study will be helpful for accurate interpretation of haematological and biochemical tests of the indigenous poultry breed. Further studies are advocated to establish baseline for various parameters of this breed of chicken.

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