

## STUDY OF GROWTH PERFORMANCE AND CARCASS CHARACTERISTICS IN MALE AND FEMALE VANARAJA CHICKENS

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**Abstract:** One hundred twenty, day-old sexed Vanaraja chicks were selected as experimental birds and distributed equally in two groups having 60 female and 60 male birds in each group respectively. Experiment was continued for 7 weeks (49 days) and both male and female birds were slaughtered by cervical dislocation method. All the parameters like mean body weight, carcass weight, feed consumption, feed conversion ratio (FCR) and different carcass traits were estimated at the end of experiment. The male Vanaraja birds resulted in significantly higher mean body weight, carcass weight and feed consumption. The feed conversion ratio (FCR) was better in female at first week then it was higher in males in subsequent weeks. A significantly higher eviscerated yield and giblet yield observed in case of male birds whereas the female birds showed significantly higher breast meat yield than males. No significant differences were observed in neck yield, wing yield, heart, gizzard, back yield, thigh yield and drumstick yield.

**Keywords:** Growth, carcass, male, female, Vanaraja, chickens.

### Introduction

Poultry industry in India started as a backyard activity and Indian poultry sector has been growing at a rate of 8-10% annually over last few decades with broiler meat volumes growing at a rate of 10% due to increased domestic consumption. Rural poultry sector contributes nearly 30% to the national egg production but it is most neglected one; even though it fetches higher price than that of commercial poultry (Khan, 2006). Poultry is the quickest source of meat and eggs and its production involves the least hazardous process in relation to other livestock enterprises. Most of the rural demand for eggs and meat is fulfilled by backyard poultry rearing which is cheap and readily available protein source for economically backward classes of people. Vanaraja is a dual purpose multi coloured synthetic bird developed by Project Directorate of Poultry Research, Hyderabad (ICAR)

which has assumed greater importance in rural conditions not only due to its ability to protect itself from predators but also having high disease resistance capability. Several previous studies had been undertaken on the growth performance of Vanaraja birds which indicates that male birds attain body weight of 1.89kg and female birds 1.15kg at an age of 10weeks. At this age, carcass yield was 64.58% and 61.36% in male and female birds respectively (Suresh *et al.*, 2005). Similarly the average Feed Conversion Ratio was found to be 2.36 in male birds where as in female birds it was 2.71 which clearly indicate that male birds are efficient converter of feed as compared to their female counterpart (Kumaresan, 2008).

### Materials and Methods

The research work was carried out for eight weeks in the Instructional Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, Orissa University of Agriculture and Technology, Bhubaneswar, Odisha. One hundred twenty Vanaraja chicks (60 male + 60 female) were used for experiment and were randomly divided into two separate groups.

1. Treatment- 1: Male Vanaraja – 60 birds
2. Treatment- 2: Female Vanaraja – 60 birds

The feeding and management of both groups were similar according to standard norms. Deep litter rearing arrangements were prepared two days prior to arrival of chicks. The deep litter house was divided into two compartments using wire netting. Vaccination of birds was done regularly according to standard guidelines. All birds were fed as per BIS standard. The composition of diet is presented in Table 1.

**Table 1. Ingredients (%) of broiler starter and finisher diets**

Components (% DM Basis)	Pre-starter	Starter	Finisher
Dry matter	88.82	898.16	89.32
Crude protein	22.92	21.88	19.65
Metabolizable energy*	2970	3092	3166
(Kcal/kg)			
Ether extract	3.09	3.56	4.11
Crude fibre	5.16	4.82	5.29
Nitrogen free extract	64.91	65.23	66.32
Acid insoluble ash	2.56	2.52	2.49
Calcium	0.96	0.95	0.99
Phosphorous	0.72	0.71	0.69

In experiment period, weekly feed consumption were taken and at seven week total feed consumption was calculated. The FCR was calculated by dividing the weekly consumption

by weekly average live weight of the birds. At the end of the experiment, thirty birds from each group were selected for slaughtering. Body weights of each bird were taken prior to slaughter. After taking the pre-slaughter body weight, the birds were sacrificed by cervical dislocation. Different parts of the carcass were separated and weighted by using electronic balance.

### Statistical analysis

The different parameters in male and female birds were statistically analyzed by using statistical package for social science (SPSS) version 17.0. Descriptive statistics in form of Mean  $\pm$  Standard error was used to measure all the parameters. Significance level was fixed at 5% level and P value less than 0.05 were considered as significant.

### Results and Discussion

The live body weight, carcass weight, feed conversion ratio and carcass characteristics of male and female Vanaraja chickens are presented in Table 2, 3 and 4. With advancement of age, the body weight in both sexes of birds increased significantly ( $p < 0.05$ ). In male Vanaraja birds, the body weight of male birds varied from  $78.36 \pm 1.38$  to  $970.35 \pm 15$  g whereas female birds showed a variation of  $70.42 \pm 1.33$  g to  $937.05 \pm 12$ . The current finding was in agreement with a study in which similar result was found at 4<sup>th</sup> week of age observed by Kumaresan *et al.* (2008). At seven week average body weight was higher than the finding of Pradhan *et al.* (2009) as they found a average body weight was 633.53g. In many experiment it was reported that in all ages, male birds had a significantly higher body weight than that of female birds which is in support of our present study (Ghosh, 2005).

**Table 2. Mean live body weight and carcass weight body weight (g) of male and female Vanaraja chickens at different ages**

Age	Live body weight		Remark	Carcass weight		Remark
	Male	Female		Male	Female	
1 <sup>st</sup> Week	$78.36^a \pm 1.38$	$70.42^b \pm 1.33$	*	$65 \pm 1.21$	$45 \pm 1.87$	*
4 <sup>th</sup> Week	$252.02^a \pm 2.55$	$240.15^b \pm 2.51$	*	$172 \pm 2.33$	$149 \pm 2.32$	*
7 <sup>th</sup> Week	$970.35^a \pm 15$	$937.05^b \pm 12$	*	$679 \pm 1.04$	$659 \pm 1.40$	*

Means bearing different superscripts in the same row differ significantly (\*  $P < 0.05$ ).

The feed conversion ratio in better in females at first week then it was higher in males in subsequent weeks. This findings are corroborated with the finding in Vencobb broilers (Beg *et al.*, 2016). This finding of the present study revealed that the male Vanaraja chicks can efficiently utilize the feed than the female birds.

**Table 3.** Feed Conversion Ratio (FCR) of male and female Vanaraja chickens at different ages

Feed consumption			Feed Conversion Ratio (FCR)			
Age	Male	Female	Remark	Male	Female	Remark
1 weeks	140 ± 2.11	122 ± 1.34	*	1.58 ± 1.10	1.73 ± 2.11	*
4 weeks	688 ± 3.21	592 ± 1.25	*	2.73 ± 2.11	2.46 ± 2.31	*
7 weeks	1875 ± 1.11	1756 ± 2.18	*	1.93 ± 1.32	1.87 ± 1.23	*

Means bearing different superscripts in the same row differ significantly (\* P<0.05).

The different carcass parameters observed in the current study were within the normal range and similar to the findings of Balaji *et al.* (2009). A significantly higher (P<0.05) eviscerated yield was observed in male birds as compared to the female group which may be due to the higher adult body weight in case of the male birds. No significant difference was observed in the mean cut off parts like neck, wings, heart, gizzard, back, thighs and drumsticks of male and female birds. This was in agreement with the findings in broiler chicken (Basak *et al.*, 2002). The percentage yield of giblet in case of male birds was significantly higher than females. The male and female Vanaraja chickens have been recorded significantly different breast yield which may be due to the higher level of meat deposition in the breast region of female birds (Dhumal *et al.*, 2009).

**Table 4.** Carcass characteristics of male and female Vanaraja chickens at 8 weeks of age

Parameters	Male	Female	Remark
Eviscerated yield (%)	67.55 <sup>b</sup> ± 7.54	65.57 <sup>a</sup> ± 5.54	*
Neck yield (%)	6.01 ± 0.70	7.02 ± 0.50	NS
Giblet yield (%)	6.76 <sup>b</sup> ± 0.23	5.59 <sup>a</sup> ± 0.13	*
Heart (%)	0.61±0.11	0.63±0.21	NS
Gizzard (%)	3.00±0.38	3.33±0.38	NS
Wings yield (%)	9.35 ± 0.15	9.66 ± 0.11	NS
Back yield (%)	13.88 ± 3.03	12.98 ± 2.98	NS
Breast yield (%)	15.43 <sup>a</sup> ± 4.03	17.33 <sup>b</sup> ± 3.33	*
Thighs yield (%)	12.37 ± 1.05	11.82 ± 1.01	NS
Drumsticks yield (%)	11.31 ± 1.55	11.07 ± 1.42	NS

Organ proportions (% body weight of live birds)

Means bearing different superscripts in the same row differ significantly (\* P<0.05).

### Conclusion

The feed consumption was significantly higher (P<0.05) in males at seven week of age. The feed conversion ratio was better in female at first week then it was higher in males in subsequent weeks. A significantly (P<0.05) higher eviscerated yield and giblet yield observed in case of male birds whereas the female birds showed significantly higher breast meat yield

than males. No significant differences were observed in neck yield, wing yield, heart, gizzard, back yield, thigh yield and drumstick yield.

### References

- [1] Balaji, K., Jalaludeen, A., Churchil, R.R., Peethambaran, P.A., Senthilkumar, S. (2009). Effect of dietary inclusion of Azolla (*Azolla pinnata*) on production performance of broiler chicken, *Indian Journal of Poultry Science*, **44**(2): 195-198.
- [2] Basak, B., Pramanik, A.H., Rahman, M. S., Tarafdar, S.U. and Roy, B.C. (2002). Azolla (*Azolla pinnata*) as a feed ingredient in broiler ration, *International Journal of Poultry Science*, **1**(1): 29-34.
- [3] Beg, M.A.H., Saiful Islam, K.B.M., Aftabuzzaman, M and Mahbub, A.S.M. (2016). Effects of Separate Sex Growing on Performance and Metabolic Disorders of Broilers, *International Journal of Animal Resources*, **1**(1): 19-26.
- [4] Dhumal, M.V., Siddiqui, M.F., Siddiqui, M.B.A. and Avari, P.E. (2009). Performance of broilers fed on different levels of Azolla meal, *Indian Journal of Poultry Science*, **44**(1): 65-68.
- [5] Ghosh, M.K., Ahmed, F.A., Buragohain, R., Pathak, P.K. and Bhattacharya, M. (2005). Growth performance of Vanaraja birds in high altitude areas of Arunachal Pradesh under backyard system of management. In: *Proceedings of 23rd Annual Conference and National Symposium (IPSACON), held on Feb, 2-4; Hyderabad, India*, **2**: 368.
- [6] Khan, A.A., Bidabadi, F.S. (2004). Livestock revolution in India: Its impact and policy response, *South Asia Research*, **24**(2): 99-122.
- [7] Kumaresan, A., Bujarbaruah, K.M., Pathak, K.A., Bijoy Chhetri, B., Ahmed, S.K. and Haunshi, S. (2008). Analysis of a village chicken production system and performance of improved dual purpose chickens under a subtropical hill agro-ecosystem in India, *Tropical Animal Health and Production*, **40**(6): 395-402.
- [8] Pradhan, P.C., Kesh, S.S., Dey, M., Bera, S., Nandi, D., Roy, S., Samanta, A.K., Samanta, R. and Majumder, S. C. (2009). Comparative study on different egg quality traits of Rhode Island Red, Vanaraja & Desi (non-descript) chicken in intensive system, *Journal of Interacademia*, **13**(2): 193-197.
- [9] Suresh, Kr., Ngachan, S.V., Shyam Sundar, G. and Keinatombi Devi, N. (2005). Production performance of Vanaraja birds under traditional system of rearing in Manipur, ([http://www.poulvet.com/poultry/articles/family\\_farming/vanarja\\_birds.php](http://www.poulvet.com/poultry/articles/family_farming/vanarja_birds.php)).