

Original Research Article

<https://doi.org/10.20546/ijcmas.2020.910.052>

Performance of Caponized Local Chicken under Different Production Systems for Small Scale Production in Resource Poor Settings

Bitupon Dutta, Raj Jyoti Deka*, Amulya Kumar Gogoi, Bibeka Nanda Saikia, Jog Dev Mahanta, Saurabh Kumar Laskar and Chinmoy Dutta

College of Veterinary Science, Assam Agricultural University Khanapara, Guwahati, Assam, India

*Corresponding author

ABSTRACT

Keywords

Capon, Intensive management, Local chicken

Article Info

Accepted:
07 September 2020
Available Online:
10 October 2020

To explore the productivity of caponized local chicken, an experiment was carried out with thirty (30) numbers of healthy caponized local chicken cockerels of Assam of about 7-8 months of age (210 ± 10 days) for a period of six months. The capons were randomly divided into three groups (T_1 , T_2 and T_3) of ten numbers each. One nutritional treatment was adopted for two groups (T_2 and T_3) with formulated grower ration of poultry (CP 16.41% and ME 2650 Kcal/ kg). The control group (T_1) was reared in backyard condition with minimum supplementary feed. The average fortnightly change in body weight of capons of T_3 was found to be significantly higher than T_2 and T_1 after 6 months of experimental period. The body weight gain was significant ($P < 0.05$) between T_3 and T_1 as well as T_2 and T_1 . The feed conversion efficiency of capons was more in cage system (T_3).

Introduction

Poultry farming in India is considered to be the techno-commercial industry which has been transformed from the status of backyard farming since last few decades and India occupying the third position in egg production and fifth position in chicken meat production in the World. According to 19th livestock census of India, poultry population of India was estimated as 729.21 million with 82.93 billion eggs and 3.26 million tones of chicken meat production. This production has been generally achieved by commercial poultry operation; however, a significant contribution

is generated from rural poultry also. Though major share of the poultry products come from commercially reared improved breed of birds, the source of indigenous poultry eggs and meat are always appreciated for their taste and texture in both rural and organized markets.

Capons are male chickens whose testes have been surgically removed through the process of caponization. The practice of caponization is very old, with records indicating that it was performed more than 2000 years ago, as mentioned by Aristotle in his *Naturalis Historia*. In the renaissance, the capon had its

great splendor since it was the preferred food of the lords. Although superseded by modern broiler production, the caponization practice still survives today.

The rearing and marketing of capons, a traditional culture, is restricted only to the *Tribal* and *Adivasi* communities of Assam. They used to rear the caponized indigenous chicken traditionally with no supplemented feed in the backyard for holy purposes. No recordable experiment has been found to be undertaken scientifically on production potentiality of rearing indigenous chicken cockerels till today even at national level.

Materials and Methods

Thirty (30) numbers of caponized local chicken cockerels of Assam of about 7-8 months of age and apparently in similar weight were used for the experiment. The cockerels were randomly divided into three (3) groups of ten (10) birds in each group, *i.e.* T₁, T₂ and T₃. The cockerels of T₁ group were reared as control without any treatment in backyard field condition. The cockerels of T₂ and T₃ groups were housed in deep litter and individual cage system of management respectively. The birds were put in well ventilated, clean and dry cages made of metallic wire of 18 x 14 x 20 inch sizes having a metallic tray for collection of faecal materials at the bottom. In the deep litter system of management paddy, husk was used as a bedding materials and rotation of the litter material was done at weekly interval to prevent growth of any diseased producing organism. Proper and scientific measures were under taken to maintain hygiene and sanitation in the experimental site. The selected birds were dewormed prior to commencement of the experiment; faecal examination was carried out at regular intervals to ensure soundness of the birds. The birds of T₂ and T₃ were fed *ad lib* grower

ration with a dietary energy level of 2650 Kcal ME /kg and 16 per cent CP for a period of 6 months with continuous clean drinking water flow.

The initial body weight of the experimental birds were recorded at the time of receiving the birds at experimental site and fortnightly body weights and body weight gain were recorded for 6 months. The data obtained in the study were analyzed statistically using GLM procedure of SAS Enterprise Guide 4.2.

Results and Discussion

Body weight and body weight gain

There was a gradual increase in body weight of capons in all three groups as the age of capons advanced (Table 1). The initial and final body weight of capons in T₁, T₂ and T₃ were recorded as 0.922 ± 0.002 and 1.364 ± 0.039 , 0.921 ± 0.001 and 1.769 ± 0.047 , 0.922 ± 0.002 and 1.902 ± 0.033 kg respectively. The average fortnightly change in body weight of capons of T₃ was found to be significantly higher than T₂ and T₁ after 6 months of experimental period.

The body weight gain of the capons in T₁, T₂ and T₃ were recorded as 0.442 ± 0.04 , 0.848 ± 0.03 and 0.980 ± 0.04 kg respectively. The highest total body weight gain of capons has been recorded in T₃ group reared under cage system of management. The body weight gain was significant ($P < 0.05$) between T₃ and T₁ as well as T₂ and T₁.

The present findings in regards to fortnightly body weight change and body weight gain are almost in agreement with the findings of Chatterjee *et al.*, (2002) and Rahman *et al.*, (2004) who reported significantly increased body weight gain in caponized birds compared to non-caponized birds ($p < 0.01$) (Fig. 1 and 2).

Table.1 Average fortnightly changes in body weight (kg) of capons under different treatments

Fortnights	T ₁	T ₂	T ₃	P – value
Initial	0.922 ± 0.002	0.921 ± 0.001	0.922 ± 0.002	0.0662 ^{NS}
1	0.925 ± 0.008	0.926 ± 0.024	0.928 ± 0.040	0.0603 ^{NS}
2	0.927 ± 0.016	0.938 ± 0.023	0.944 ± 0.040	0.1195 ^{NS}
3	0.929 ± 0.015	0.970 ± 0.023	0.969 ± 0.041	0.1649 ^{NS}
4	0.969 ± 0.017	1.001 ± 0.021	1.020 ± 0.042	0.1622 ^{NS}
5	1.010 ± 0.019	1.055 ± 0.023	1.077 ± 0.042	0.0976 ^{NS}
6	1.055 ± 0.021 ^b	1.103 ± 0.023 ^{ab}	1.145 ± 0.043 ^a	0.0327 [*]
7	1.102 ± 0.024 ^b	1.218 ± 0.027 ^a	1.255 ± 0.044 ^a	0.0082 ^{**}
8	1.149 ± 0.027 ^b	1.384 ± 0.032 ^a	1.345 ± 0.044 ^a	<.0001 ^{**}
9	1.197 ± 0.031 ^b	1.497 ± 0.042 ^a	1.441 ± 0.045 ^a	0.0234 [*]
10	1.252 ± 0.034 ^b	1.580 ± 0.033 ^a	1.553 ± 0.043 ^a	<.0001 ^{**}
11	1.308 ± 0.038 ^b	1.658 ± 0.046 ^a	1.676 ± 0.042 ^a	<.0001 ^{**}
12	1.364 ± 0.039 ^c	1.769 ± 0.047 ^b	1.902 ± 0.033 ^a	<.0001 ^{**}

Mean with different superscripts differ significantly
 * = Significant, ** = Highly significant, NS = Not significant

Fig.1 Average fortnightly changes in body weight (kg) of capons under different treatments

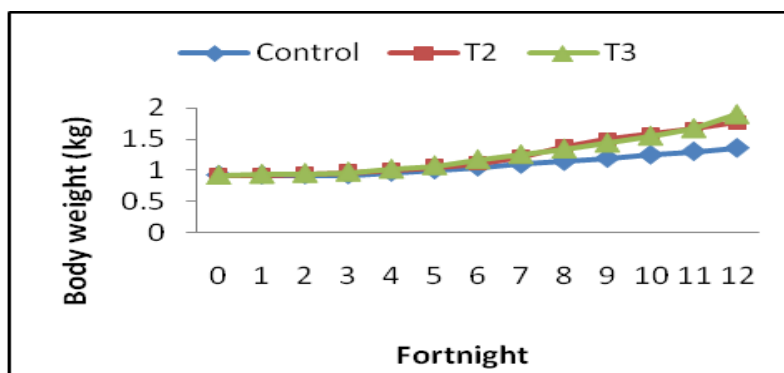
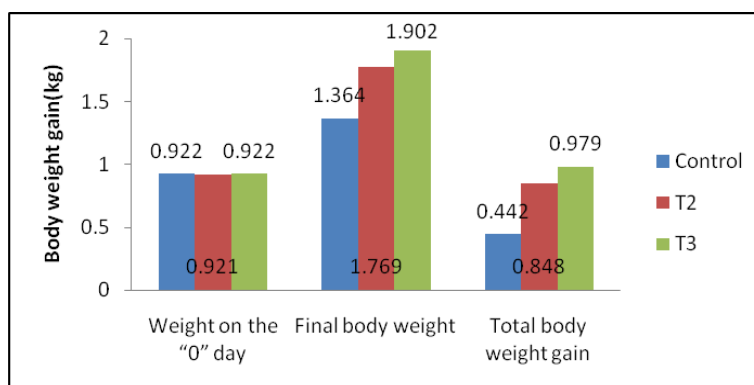


Fig.2 Total body weight gain (kg) of capons under different treatments



Chen *et al.*, (2006) reported much lower weight gain in caponized Taiwan country chicken cockerels, Shao *et al.*, (2009) in caponized male Tibetan chicken, Symeon *et al.*, (2010) in caponized medium growth broilers and Calik (2014) in caponized chicken cockerels. However, Mahmud *et al.*, (2013) reported significant differences ($p \leq 0.05$) in mean final body weight of cockerel chickens but mean weekly weight gain, feed consumption and FCR did not differ significantly ($p \geq 0.05$). The present findings are not in agreement with the findings of Bilal *et al.*, (2014) who stated better body weight, feed intake and FCR in birds reared under floor compared to cage system. The differences in total and fortnightly body weight gain of capons were primarily due to nutritional status and different systems of management.

Feed conversion ratio

The mean FCR of capons in T₂ and T₃ groups during the experimental period of six months were found to be 8.43: 1 and 12.38:1 respectively.

The feed conversion efficiency of capons was more in cage system (T₃) compared to deep litter system of management (T₂). The feed conversion efficiency of capons was found to be better in T₂ group under deep litter system though the total mean monthly feed intake and fortnightly body weight gain of capons in T₃ group were found to be higher under cage system.

The present findings are in close agreement with the findings of Khaksefidi and Rahimi (2005) in broiler chicken, Ali *et al.*, (2005) in native chicken of Bangladesh, Haunshi *et al.*, (2009) in indigenous and improved varieties of chicken in northeastern region of India, and Calik *et al.*, (2017) in Rhode Island Red (R-11) capons.

In conclusion the study revealed that capons in cage system gained higher body weight in comparison to deep litter and extensive system of management. The feed conversion efficiency of capons was better (8.43:1) in deep litter compared to cage system of management (12.38:1) indicating economical feeding in deep litter system. Being indigenous in nature, capons were observed to be more comfortable in deep litter with slightly higher net return per capon compared to cage system of management.

The indigenous capons reared under intensive system of management with *ad lib* concentrate feeding (2650 kcal/kg ME and 16.41% CP) and supply of clean drinking water witnessed higher growth rate with better net returns.

From the present study it may be concluded that the intensive rearing of indigenous capons can generate sustainable income opportunities under small scale production system in resource poor settings under intensive system of management.

Acknowledgement

The authors are thankful to the Department of Livestock Production and Management, College of Veterinary Science, Assam Agricultural University, Khanapara-781022 for giving necessary permission and facility to carry out the research work.

Conflict of interest

There is no conflict between the authors regarding the preparation of the manuscript. The research was carried out as a part of fulfillment of M.V.Sc. Degree Programme. All authors contributed to the research works and members of the research advisory committee. All authors read and approved the final manuscript.

Ethics approval

The research was carried out according to the guidelines of Institutional Animal Ethics Committee of Assam Agricultural University, Khanapara, Guwahati-781022 as per the ethics application approval number 770/ac/CPCSEA/FVSc/AAU/IAEC/16-17/471 dated 30.07.2016.

References

- Ali, M.I., Azmal, S. A., Ali, A. and Faruque, M. O. (2005). Effect of density and flock size on growth performance of native Chicken. *Journal of Bangladesh Agricultural University*, 10 (1): 55 – 59
- Bilal, K., Mahmood, S., Akram, M., Imran, S., Sahota, A.W., Hussain, J. and Ashfaq, A. (2014). Growth performance of broiler under two rearing systems in three different housing zones in an environmentally controlled house during winter. *Journal of Animal & Plant Science*, 24 (4): 1039 – 1044
- Bouvarel, I., Chagneau, A. M., Lecuelle, S. and Leterrier, C. (2009). Feed composition and hardness interact in preference and intake in chickens. *Applied Animal Behaviour Science*, 118: 62 – 68
- Calik, J., Krawczyk, J., Świątkiewicz, S., Gąsior, R., Wojtycza, K., Połtowicz, K., Obrzut, J. and Puchała, M. (2017). Comparison of the physicochemical and sensory characteristics of Rhode Island Red (R-11) capons and cockerels. *Annals of Animal Science*, DOI:10.1515/aoas-2017: 0002
- Calik, J. (2014). CAPON production – breeding stock, rooster castration and rearing methods, and meat quality – a review. *Annals of Animal Science*, 4: 769 – 777
- Chatterjee, R. N., Ahlawat, S. P. S., Yadav, S. P., Senani, S., Kunder, A., Jeyakumar, S., Saha, S. K., Sunder, J. and Bharati, D. (2002). Comparative growth performance of Nicobari fowl and their cost effectiveness under backyard and intensive systems. *Indian Journal of Poultry Science*, 37 (1): 63 – 66
- Chehraghi, M., Zakeri, A. and Taghinejad, R. M. (2013). Effects of different feed forms on performance in broiler chickens. *European Journal of Experimental Biology*, 3 (4): 66 – 70
- Chen, K. L., Hsieh, T. Y. and Chiou, P. W. S. (2006). Caponization effects on growth performance and lipid metabolism in Taiwan country chicken cockerels. *Asian-Australian Journal of Animal Science* 19 (3): 438 – 443
- Haunshi, S., Doley, S. and Shakuntala, I. (2009). Production performance of indigenous chicken of northeastern region and improved varieties developed for backyard farming. *Indian Journal of Animal Science*, 79 (9): 901 – 905
- Khaksefidi, A. and Rahimi, Sh. (2005). Effect of probiotic inclusion in the diet of broiler chickens on performance, feed efficiency and carcass quality. *Asian-Australian Journal of Animal Science*, 18 (8): 1153 – 1156
- Mahmud, M. A. Shaba, P., Gana, J., Yisa, H.Y., Ndagimba, R. (2013). Effect of surgical caponisation on growth, carcass and some haematological parameters in cockerel chickens. *Sokoto Journal of Veterinary Science*, 11 (2): 57 – 62
- May, J. D., Lott, B. D. and Simmons, J. D. (1997). Water consumption by broilers in high cyclic temperatures: bell versus nipple waterers. *Journal of Poultry Science*, 76: 944 – 947
- Quilumba, C., Quijia, E., Gernat, A., Murillo, G. and Grimes, J. (2015). Evaluation of different water flow rates of nipple

- drinkers on broiler productivity. *Journal of Applied Poultry Research*, 24: 58 – 65
- Rahman, M. M., Islam, M. A., Ali, M.Y., Khondaker, M. E. A. and Hossain, M. M. (2004). Effect of caponization on body weight, hematological traits and blood cholesterol concentration of Nara Chicken. *International Journal of Poultry Science*, 3 (4): 284 – 286
- Sena, L., Peti, D. and Nikolova, N. (2013). The effect of physical feed structure on the commercial broiler performance. *Macedonian Journal of Animal Science*, 3: 207 – 212
- Shao, Y., Wu, C., Li, J. and Zhao, C. (2009). The effects of different caponization age on growth performance and blood parameters in male Tibetan chicken. *Asian Journal of Animal & Veterinary Advances*, 4: 228 – 236
- Symeon, G., Mantis, F., and Bizalis, I. (2010). Effect of caponization on growth performance, carcass composition, and meat quality of medium growth broilers. *Journal of Poultry Science*, 89(7): 1481 – 1489
- Viola, T. H., Ribeiro, A. M. L. and Penz, Jr. A. M. (2005). Compensatory water consumption of broilers submitted to water restriction from 1 to 21 days of age. *Brazilian Journal of Poultry Science*, 7 (4): 243 – 245

How to cite this article:

Bitupon Dutta, Raj Jyoti Deka, Amulya Kumar Gogoi, Bibeka Nanda Saikia, Jog Dev Mahanta, Saurabh Kumar Laskar and Chinmoy Dutta. 2020. Performance of Caponized Local Chicken under Different Production Systems for Small Scale Production in Resource Poor Settings. *Int.J.Curr.Microbiol.App.Sci*. 9(10): 424-429.
doi: <https://doi.org/10.20546/ijcmas.2020.910.052>