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Growth performance of Hansli × CSML birds under intensive and semi-intensive systems of management

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Abstract
The study was conducted to evaluate the growth performance of Hansli × CSML birds under intensive and semi-intensive systems of management. 186 day old chicks were brooded up to 6 weeks of age and then divided and reared separately under the two systems. The mean body weight, feed intake and FCR of birds at the end of 20th week of age, under intensive system were significantly higher ($P \leq 0.05$) than that under semi-intensive system. Mortality during 0-6 weeks of age (chick stage) was recorded as 3.22 %. Mortality recorded during 7-20 weeks (grower stage) under intensive system was lower than that under semi-intensive system. From the study, it was concluded that, with humble supplementation and availability of scavenging feed resources, semi-intensive system of chicken rearing, is more favourable for the small holder poultry keepers.

Keywords: Crossbred, intensive, poultry, semi-intensive

Introduction
In India, poultry production is characterized by the simultaneous existence of the traditional extensive production systems like backyard and free-range and the modern intensive production systems like deep-litter and cage rearing. In urban and peri urban areas, commercial rearing of poultry is mainly done under intensive system (deep litter and cage system) [3]. In rural areas, the local chickens are preferred over exotic chickens for their meat and eggs. However, they are poor performers in terms of growth rate and production. Crossbred poultry have higher feed efficiency and lower mortality as compared to purebreds and these two factors play a very important role in increasing profits in poultry production [5]. Hence, a commercial cross between native and improved birds would be an ideal replacement for the underperforming native chicken in the scavenging poultry production systems. These crossbred birds are similar in appearance to the local birds and provide significant returns with low inputs and therefore, are readily accepted by the rural farmers.
Keeping in view the above facts, the present study was aimed at assessing the effects of two different management systems (intensive-deep litter and semi-intensive) on growth performance of Hansli × CSML birds.

Materials and Methods
Location of study
The experiment was conducted in the poultry farm of the AICRP on "Poultry Breeding", Faculty of Veterinary Science and Animal Husbandry, Orissa University of Agriculture and Technology, Bhubaneswar.

Experimental design and genetic stock
Adult Hansli males and Colour synthetic male line (CSML) females at the age of 40 weeks were housed in breeding pens and their eggs were collected and hatched. One hundred eighty six (186) day old chicks of Hansli X CSML cross were collected randomly. The chicks were distributed into 6 replicate groups having 31 chicks per replicate group. All the chicks were wing banded and day-old body weight of chicks were recorded. The chicks in all six replicate groups were maintained for a period of six weeks (nursery period) on similar feeding (20 % CP and 2866 kcal/ kg ME, *ad libitum* feeding) and management conditions.

On completion of 6th week, one hundred eighty (180) birds were randomly divided into two groups of 90 birds each and each group was sub divided into three replications having 30 birds each. The two groups were reared separately under two systems of management- intensive and semi-intensive. The birds under intensive system were raised on deep litter with a floor space @ 2.5 ft^2/bird while birds under semi-intensive system were provided coop floor space @2.5 ft^2/ bird and pasture run space @ 15 ft^2/bird. The pasture area predominantly was covered with grasses and low plants like *Cynodon dactylon* (Doob grass), *Talinum triangulare* (water leaf) and *Tridax procumbens* (Bisalyakarani). The pasture run space was securely fenced around to avoid danger of predators. Birds under intensive system were fed *ad libitum* diet containing 18 % CP and 2822 kcal/kg ME [1] while birds under semi-intensive system were fed 50% of the amount allocated to birds under intensive system and allowed to scavenge in pasture.

Body weights of all birds were recorded at dayold and at weekly interval up to 20 weeks of age. The feed consumption of the experimental birds was recorded on weekly basis by subtracting the left over feed at the end of the week from the total feed offered during the week. Cumulative feed consumption was calculated by adding the feed consumption from 1st week up to the desired week. For semi-intensive system, only the formulated feed consumption was taken into consideration as there was no way of knowing their consumption during scavenging.

Data analysis

Data collected in the above experiment were statistically analyzed using SPSS (V 25.0) computer package. Data was subjected to t-test to know the significance level of different parameters. The differences between means were declared significantly at P≤0.05.

Ethical approval

All applicable international, national and/or institutional guidelines for the care and use of animals were followed.

Results and Discussion

Body weight

Body weight (g) of Hansli × CSML birds at different ages reared under intensive and semi-intensive system of management is presented in Table 1. In the study, the mean body weight of Hansli × CSML birds was recorded as 40.46±0.14 g and 429.50±4.37 g at day old and 6th week of age, respectively. The present findings were in accordance with the findings of various authors who reported comparatively lower bodyweight [6, 8, 10, 13, 20].

The final bodyweight of birds under intensive and semi-intensive system were recorded as 2665.28±36.97 g and 1716.07±39.76 g, respectively. The body weight of birds under intensive system was found to be significantly (P≤0.05) higher than birds under semi-intensive system throughout the experimental period. This may be due to lower concentrate feed intake accompanied with scavenging by birds under semi-intensive system. These findings were in agreement with the findings of many authors who studied the effect of the housing system on the final bodyweight and reported that chickens reared under semi-intensive system obtained a lower bodyweight as compared to chickens under intensive system [11, 12, 14]. The difference in results and findings might be credited to the variations in breed-strain of birds, feed supplement, management system, pasture availability and various environmental factors.

Table 1: Body weight (g) of Hansli × CSML bird at different ages reared under intensive and semi-intensive system of management

Age	Body weight (g)			
	Nursery management			
Day old	40.46±0.14			
6th week	429.50±4.37			
	Intensive system	N	Semi-intensive system	N
8th week	704.71^{a}±8.10	90	583.15^{b}±8.71	86
12th week	1545.77^{a}±14.27	90	1091.98^{b}±14.78	86
16th week	2211.29^{a}±26.61	69	1496.45^{b}±27.05	69
20th week	2665.28^{a}±36.97	63	1716.07^{b}±39.76	63

a, bMean with different superscripts in a row differ significantly (P≤0.05)

N= number of observations

Feed consumption

Feed consumption (g) of Hansli × CSML bird at different ages reared under intensive and semi-intensive system of management is presented in Table 2. The feed consumption per bird at the end of nursery period (0-6 weeks) was 809.47±2.65 g. Analyzing the mean feed intake per bird, significantly higher feed intake was observed under intensive system (9391.50±44.37 g) than that of semi-intensive system (5138.28±16.72 g) of management at the end of 20 weeks of age. Birds under semi-intensive system took their food by grazing and scavenging and were provided with less amount of feed as supplement. The present findings corroborated the findings of Sanka and Mbaga (2014) [14] and Patel *et al.* (2018) [12], who reported feed consumption of birds under intensive system to be higher than that of semi-intensive system. However, the present findings were not in agreement with the findings of other authors [9, 18], who reported that management systems have no significant effect on the feed consumption in broiler chicks.

Table 2: Feed consumption (g) of Hansli × CSML bird at different ages reared under intensive and semi-intensive system of management

Age (in weeks)	Cumulative feed intake (g) (N=50)	
	Intensive system	Semi-intensive system
0-8	1615.54^{a}±17.09	1233.46^{b}±3.01
0-12	4246.89^{a}±20.22	2620.31^{b}±2.56
0-16	6872.29^{a}±26.84	3924.01^{b}±4.97
0-20	9391.50^{a}±44.37	5138.28^{b}±16.72

a, bMean with different superscripts in a row differ significantly (P≤0.05);

N= number of observations

Feed conversion ratio

Feed conversion ratio of Hansli × CSML bird at different ages reared under intensive and semi-intensive system of management is presented in Table 3. The feed conversion ratio of Hansli × CSML birds at the end of nursery period (0-6 weeks) was 2.13±0.02. At the end of 20th week of age, FCR of birds under intensive and semi-intensive systems were recorded as 3.62±0.05 and 3.13±0.05, respectively. Significantly higher FCR was recorded for birds under intensive system as compared to semi-intensive system throughout the experimental period. The present findings corroborated with the findings of many previous authors [11, 12, 14, 15, 16] who reported that birds reared under semi-intensive system had lower FCR indicating better feed conversion

efficiency as compared to birds reared under intensive system. The difference in results might be due to difference in breed of birds, amount of feed consumed, type and availability of pasture, management and environment conditions.

Table 3: Feed conversion ratio of Hansli x CSML bird at different ages reared under intensive and semi-intensive system of management

Age (in weeks)	Feed conversion ratio (N=50)	
	Intensive system	Semi-intensive system
8th	2.46a±0.03	2.31b±0.03
12th	2.84a±0.03	2.53b±0.03
16th	3.20a±0.04	2.74b±0.04
20th	3.62a±0.05	3.13b±0.05

a, bMean with different superscripts in a row differ significantly (P≤0.05)
N= number of observations

Mortality

The mortality of Hansli × CSML birds during 0-6th week of age was 3.22 %. During 7-20th week of age mortality under intensive and semi-intensive system was 0 % and 4.44 % respectively. The present findings were in accordance with the findings reported by Kalio *et al.* (2012) [7] and Abalaka *et al.* (2013) [2] that the mortality rates for birds under intensive system (3.3 and 7.36 %) were lower than that of semi-intensive system (5 and 39.05 %), respectively. Mortality in semi-intensive system was due to predator attacks, which was in agreement with the findings of various workers [4, 17, 19] who stated that risk of predation is a major constraint in rural chicken production conditions.

Conclusion

Rearing system has a significant influence on growth performance and feed efficiency of birds. Birds under semi-intensive system consumed relatively less supplementary feed and resulted to have better feed conversion efficiency as compared to birds under intensive system at all ages. This implies that, with modest supplementation and assuming availability of scavenging feed resources, semi-intensive system of chicken rearing, is more favourable for the small holder poultry keepers.

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References

1. AOAC. Official Method of Analysis. 12th ed. Association of Official Analytical Chemists. P.O. Box 540, Benjamin Franklin Station, Washington D.C.-20044, 1995.
2. Abalaka GO, Mkpado M and Ugwu SOC. Rearing methods, seasons of the year and survivability of rural poultry enterprise in Nigeria. Journal of Agriculture and Sustainability. 2013; 3(1):27-55.
3. Bessei W. Tendencies of world poultry production. In: Proceedings of Third International DLG-Symposium on Poultry production in hot climates, Hamelin Germany, 1987.
4. Deka P, Sarma M, Nath PJ, Borgohain R, Mahanta J, Deka B *et al*. Production performance of Vanaraja bird under traditional system of rearing in Assam. International Journal of Livestock Research. 2014; 4(2):81-85.
5. Dwivedi HB, Singh C and Kushwaha NS. Study on mortality and feed conversion efficiency in inbreds and their crosses. Poultry guide, 1986, 44-47.
6. Jha DK and Prasad S. Performance of improved varieties and indigenous breed of chicken in Jharkhand. Indian Journal of Poultry Science. 2013; 48(1):109-112.
7. Kalio GA and Okafor BB. Response of Broilers to Two Management Systems of Housing in Etche Local Government Area of Rivers State, Nigeria. Asian Journal Agriculture and Rural Development. 2012; 2(2):184-188.
8. Kalita N, Barua N, Pathak N and Islam R. Performance of Vanaraja birds reared under intensive system of management in Assam. Indian Journal of Poultry Science. 2012; 47(1):125-127.
9. McCartney MG. Effect of type of housing on production of broilers. Poultry Science. 1977; 56:1052-1053.
10. Padhi MK, Chatterjee RN, Rajkumar U. A study on performance of a crossbred chicken developed using both exotic and indigenous breeds under backyard system of rearing. Journal of Poultry Science and Technology. 2014; 2(2):26-29.
11. Patel N, Jha DK, Shrivastava AK, Baskar K. Performance of Gramapriya poultry birds under different systems of management. Journal of Agricultural Technology. 2013; 9(7):1769-1774.
12. Patel N, Sundi B, Prasad S, Kumar R, Mandal B. Growth Performance of Vanaraja Birds under Different System of Management. International Journal of Current Microbiology and Applied Sciences Special Issue. 2018; 7:691-695.
13. Saadey, Mekky S, Galal A, Zaky HI, Zein El-Dein A. Diallel crossing analysis for body weight and egg production traits of two native Egyptian and two exotic chicken breeds. International Journal of Poultry Science. 2008; 7(1):64-71.
14. Sanka YD and Mbaga SH. Evaluation of Tanzanian local chicken reared under intensive and semi-intensive systems: I. Growth performance and carcass characteristics. Livestock Research for Rural Development. 2014; 26(7):1-7.
15. Santos AL, Sakomura NK, Freitas ER, Fortes CMS, Carrilho ENVM. Comparison of free range broiler chicken strains raised in confined or semi-confined systems. Revista Brasileira de Ciência Avícola. 2005; 7(2):85-92.
16. Sogut B, Inci H and Sengul T. Growth performance and carcass traits of broiler reared in conventional and organic conditions. Asian Journal of Animal and Veterinary Advances. 2011; 6(10):992-1000.
17. Weyuma H, Singh H and Megersa M. Studies on management practices and constraints of backyard chicken production in selected rural areas of Bishoftu. Journal of Veterinary Science and Technology. 2015; 12(3):1-9.
18. Wo EL. Comparison of two rearing system wire floor and deep litter for broiler fed a laxative diet. Cuban Journal of Agricultural Science. 1985; 19:61-67.
19. Zaman MA, Sorensen P and Howlider MAR. Egg production performances of a breed and three crossbreeds under semi-scavenging system of management. Livestock

Research for Rural Development. 2004; 16(8):104-117.
20. Zuyie R, Sharma VB, Bujarbaruah KM and Vidyarthi VK. Production performance of Vanaraja birds in Nagaland. Indian Veterinary Journal. 2011; 88(8):138-139.