

Production Performance of Indigenous Chicken (*Gallus domesticus* L.) under Backyard Condition in Sindhudurg District of Maharashtra

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ABSTRACT

Performance in terms of body weight, age at first egg, egg production and mortality of Indigenous chicken of Sindhudurg district were studied under backyard system of rearing. The overall mean body weight was significantly ($P \leq 0.05$) higher in indigenous birds reared under control condition (upto 6 weeks) than backyard system. The average age of first egg laying was recorded as six-seven months in indigenous chicken. The mean egg production at 72 weeks of age in indigenous chicken recorded as 51.93 number of egg per hen under control condition, in case of backyard system the corresponding values were recorded as 42.73, respectively. The mean egg production of indigenous birds in control condition at 72 weeks of age was significantly higher ($P \leq 0.05$) than backyard system. There was significant difference in mortality rates between two groups during 6 to 30 and 31 to 52 weeks of age.

Key words Backyard system, egg production, indigenous chicken, mortality rate.

Chickens are considered as one of the most important and widely distributed avian species among poultry birds. It is a very good source of animal protein for human consumption. Backyard poultry farming is an age-old practice among rural people of India including Maharashtra. It is a potent tool for livelihood promotion of the rural people of Maharashtra. Backyard poultry farming by and large was a low input or no input venture (Saha, 2003). Besides income generation, backyard poultry helps in alleviation of malnutrition of the rural people through production of valuable animal protein and empowers rural women. In spite of low productivity, the contribution of backyard poultry towards Indian egg production is about 30 to 40 per cent (Panda *et al.*, 2008). In Maharashtra, the eggs and meat of indigenous chicken fetch fair prices as compared to that of commercial chicken.

Backyard poultry do not require large investment to start and maintain as compared to commercial poultry (Alders *et al.*, 2009). Keeping in view, the present study has been undertaken to assess various productive traits of indigenous birds under backyard system of reared in Sindhudurg district of Maharashtra.

MATERIALS AND METHODS

The study was conducted in the district of Sindhudurg, which is located between 73.19 and 74.13 longitude east and 15.37 and 16.40 latitude north in the Western Konkan region of Maharashtra. It has elevation of 86.6 meters above the main sea level. The Sindhudurg District is surrounded by Kolhapur at east, Belgaon district and Goa state at South, Ratnagiri at North and Arabian Sea at west. The district is characterised by highly humid atmosphere and rains. The study was carried out during the period from December, 2012 to July, 2014. A total of 376 numbers of unsexed day old desi chicks were procured from a private hatchery of Ahmadnagar district and were distributed among fifteen numbers of farmers, each with twenty five numbers of chicks. The farmers were selected through Participatory Rural Appraisal technique on existing poultry rearing system. A questionnaire was designed and tested to collect data on family size, production system of indigenous chicken and its effect on income generation, supplementary income, and nutrition on farmer, marketing of produces, problem and prospects of indigenous poultry. The selected farmers were evaluated through the use of pre-tested standard proformae. Training on motivation cum capacity building towards improved family poultry farming and skill development training on poultry were conducted to improve the knowledge level of the farmer by imparting scientific skills on management, feeding, breeding and health care. The half number indigenous chicks were brooded for

5-6 weeks depending upon the environmental temperature under hover brooder and were provided with sufficient clean drinking water and commercial chick starter feed *ad libitum* during the brooding period and remaining chicks were let loose in backyard condition (not provided brooding). After proper brooding the chicks were reared in two groups viz., T₁ control housing system (reared initial period upto 6 weeks) and T₂ free range system (backyard system). The birds were vaccinated against *Ranikhet* and *Gumboro* diseases at 7 days and 14 days, respectively and *Ranikhet* disease vaccine (R₂B strain) used every two months. The data on body weights at 8, 20, 40, 52 and 72 weeks of age, age at first egg, egg production and egg weight at 72 weeks of age were recorded. Mortality was recorded at 0 to 5, 6 to 72 weeks of age. The data collected on various traits were subjected to standard statistical analysis (Snedecor and Cochran, 1994).

RESULTS AND DISCUSSION

Entire household in the present study was involved in family chicken production and practiced semi-intensive rearing system. The study revealed that 80% of the respondents said that their chickens did not receive enough feed, indicating that nutrition is a major constraint in backyard poultry production.

Growth performance of indigenous birds

The mean body weights at 8, 20, 40, 52 and 72 weeks of age were recorded as 306.41±4.43g, 682.80±7.45g, 956.54±2.63g, 1209.05±4.79g and 1450.00±10.09g, respectively in control system and 294.84±5.05g, 652.46±8.9g, 879.04±12.50g, 1117.88±2.17g and 1342.62±10.74g, respectively in case of backyard system (Table 1). The overall mean average body weight of indigenous chickens were recorded 1407.26 g in T₁ group and 1261.21 T₂ group at 72 weeks ages (Table 1). The results were almost similar to Kalita, *et al.*, 2011 who reported 1.44±0.1 kg in indigenous chickens. The overall average body weight of indigenous chicken found non-significant among management system. In contrast to the present finding, Zuyie *et al.*, 2009 reported lower body weight in Vanaraja birds at 72 weeks. Indigenous chicken of Maharashtra attain the sexual maturity at 6-7 months of age as reported by majority of the local farmers. Chutia, 2010 and Kalita, *et al.*, 2011 also reported almost similar range in case of sexual maturity. Contrary to the present study, several researcher, (Chatterjee, *et al.*, 2003 and Ramappa, 2004) reported a delayed sexual

maturity in indigenous chicken than the present investigation. The delayed sexual maturity due the feeding management, climatic condition and genetic makeup of chicken.

Egg production of indigenous birds

The mean egg production at 72 weeks of age in indigenous birds under control condition was recorded as 51.93 numbers respectively and in case of backyard system, the corresponding values were recorded as 42.73, respectively (Table 1). The indigenous birds generally egg laying started at 6 to 7 months in study area. Kalita *et al.* (2011) recorded similar range in sexual maturity in indigenous birds under rural condition of Assam. The indigenous chicken layers produced 42 to 57 eggs per year. The mean egg production was also significantly ($P < 0.05$) differ between two housing groups, which might be due to different management condition of two groups. Hence our results agree with Chutia (2010) recorded an average annual egg production of indigenous chicken which ranged from 53.0±0.23 to 58.4±0.26 numbers. Islam *et al.* (2014) also recorded overall average egg production of indigenous upto 52 weeks 43.57±0.72 eggs. Low genetics potentially, poor management practices, lack of proper health care, poor nutrition and housing might be the possible reasons of the lower egg production. In contrary to the present finding several researchers (Ramappa, 2004; Yousef and Yousef 2007 and Vali, 2008) reported higher annual egg production compared to present finding.

Mortality rate of Birds

The mortality rate of birds in both the management systems were presented in Table 2. The average mortality in both systems were 15.57±4.87 per cent. It was found that there was significant ($P < 0.05$) difference in mortality rate between control system and backyard condition during 0 to 5 weeks of age which might be due to improper artificial brooding in indigenous chicks. Later on the mortality rate decreased with the advancement of age in both management conditions. The higher early chick mortality up to 5th week of age might be due to cold shock, because of faulty brooding management. Kalita *et al.*, 2012b also reported lower mortality rate (6-10%) of chick mortality in indigenous chicken of Assam. Kumaresan *et al.*, 2008 also recorded 8.4% of mortality up to 5th week of age in case of Vanaraja birds and Shakir *et al.*, 1999 also reported a lower

Table 1. Body weight gain of male and female, average egg production and predictor losses of indigenous chickens under backyard system.

Traits	Control housing system		Backyard system	
	Male	Female	Male	Female
Body weight gain				
Day old chicks (g)	27.09±0.28		26.48±0.28	
8 week body weight (g)	306.41±4.43 ^a	274.34±4.60 ^b	294.84±5.05 ^a	279.55±2.80 ^b
20 week body weight (g)	682.80±7.45 ^a	663.78±3.83 ^b	652.46±8.91 ^a	620.77±6.13 ^b
40 week body weight (g)	956.54±2.63 ^a	916.90±6.78 ^b	879.04±12.50 ^a	781.54±11.95 ^b
52 week body weight (g)	1209.05±4.79 ^a	1109.97±12.0 ^b	1117.88±2.17 ^a	1000.57±8.71 ^b
72 week body weight (g)	1450.00±10.09 ^a	1375.71±3.02 ^b	1342.62±10.74 ^a	1247.99±3.63 ^b
Egg production/birds/year	-	51.93 ^a	-	42.73 ^b
Mortality rate (%)	4.27 ^b		26.87 ^a	

(^{a,b}means showing different superscript with row sex wise differ significantly P<0.05)

mortality (13.6%) in Chitral. In contrast to the present findings, Ghosh *et al.*, 2005 also reported higher mortality percentage of 22.63% in Vanaraja up to 6 weeks of age in high altitude of Arunachal Pradesh and Farooq *et al.* (2000) also recorded higher mortality rate (29.8%) in Mardan division. They were also recorded highest mortality during the brooding period. The average mortality rate in control housing system and free range system was 4.27 per cent and 26.87 per cent, respectively. It was found that there was significant (P<0.05) difference in mortality rate between control housing system and free range system during initial study period which might be due to improper artificial brooding in indigenous chicks. The disease outbreak coupled with, predation losses, theft, cold weather and improper brooding practices were the main reason for high mortality in free range system as compared to control housing system. The major reasons for mortality of birds in free range system and control housing system were predators attack and disease. Hence the finding agreed with the observations of Kornel, 2008 who reported that major constraints to backyard poultry were losses from mortality due to diseases and predators.

It can be concluded that performance of indigenous chicken under backyard condition is comparable with control system in terms of body weight, egg production as well as for other traits under backyard system of rearing in Sindhudurg district. Age at first egg and egg weight were similar in both system. The backyard poultry owners can improve their poultry bird production by the use of below instruction. The backyard

poultry farming with improved birds provide a better livelihood security to the poor farmers paving a way for sustainable agriculture in rural areas. So, it is suggested that this birds can be successfully reared under the prevailing conditions of Sindhudurg to sustain meat and egg availability in the rural areas. So, farmers from rural and tribal areas of Sindhudurg district can rear indigenous birds for their livelihood and nutritional security.

Suggestions for obtaining high returns from backyard poultry farming

- a) Protect birds from predators.
- b) Provide additional concentrate feed.
- c) Provide clean and fresh drinking water.
- d) Provide optimum space to avoid overcrowding.
- e) Proper vaccination, de-worming, de-beaking and veterinary care.
- f) Regular disinfection of poultry house and surrounding.

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