



Performance of cross-bred (White Pekin × Khaki Campbell) ducks under extensive system of rearing

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ABSTRACT

The performances and economics of crossbred (White Pekin × Khaki Campbell) ducks produced through artificial insemination and reared under extensive system of management were studied. A total of 150 day old ducklings were randomly distributed to six farmers in three villages (25 number each) of Odisha state and they were guided to maintain the birds with the resources available with them. The ducklings were brooded for ten days during which they were offered boiled broken rice. Subsequently they were fed from the surroundings besides being offered kitchen wastes, left over rice, vegetable peels, fish scales, etc. The birds were utilizing the village ponds for swimming and as feeding source. A secured night shelter was provided to each flock. The growth and production performances and mortality rate were recorded to the possible extent up to 40 wks of age by the combined effort of farmer family and project personal. The income generated through sale of birds and eggs were recorded for calculation of economics. It was observed that the overall mortality rate was 12% and the birds gained the body weight of 577.69±15.88 g, 1065.31±16.36 g, 1763.33±35.17 g and 1840.64±36.30 g at 4th, 8th, 16th and 24th week of age with first egg of the flock on ~150 days. The duck village/house egg production up to 40 weeks age was found to be 51.25% with 59.43±0.50 g average egg weight on 40th week. Further, the net profit of ₹9900 was calculated for individual flock considering the income from sale of eggs and live ducks and only expenditure towards cost of day old ducklings. It was concluded that cross-bred (WP × KC) ducks are suitable for rearing in farmers' field with a higher economic gain.

Keywords: Body weight, Cross-bred duck, Economics, Egg production

Among all avian species, ducks are considered as good layers with considerably bigger sized eggs than chicken. In India, the duck population is 33.51 million of which 32.5 million (~97%) are found in backyard (20th Livestock Census, 2020, Government of India) that indicates the affinity of rural farmers towards duck farming. Further, it is reported that ducks found in backyard are mostly of indigenous varieties and are reared by marginal and landless farmers (Padhi *et al.* 2022) for meat and egg purpose. Production performance and economic return of two varieties of ducks (Khaki Campbell and Native duck of Odisha, India) under extensive system of management was studied (Giri *et al.* 2014) in tribal districts and it was recommended that multicoloured cross-bred ducks may be introduced in rural farmer's field to be reared in village ponds. Considering the above facts, the present experiment was planned to study the performance of cross-bred (White Pekin × Khaki Campbell) ducks under extensive/backyard system of rearing in three villages of Odisha state.

MATERIALS AND METHODS

The present study was carried out with six farmers of three villages (Patharagadia, Dalua, Munda sahi) of Khurda district, Odisha which are within a radius of 25 km from Regional Station, ICAR- Directorate of Poultry Research, Bhubaneswar. A total of 150 day old ducklings (White Pekin × Khaki Campbell) produced through artificial insemination (Giri *et al.* 2016) were supplied (25 each) to the farmers for rearing in backyard. The ducklings were brooded under electric bulb inside the indigenously made low-cost duck houses constructed by the farmers. Rice husk as litter material was used in all the duck houses. No commercial feed was offered to the ducklings all through the experiment period. Boiled broken rice (*ad lib.*) as initial feed from day 0 and clean drinking water in flat plastic trays were provided during brooding period of 8-10 days. However, antibiotic preparation in drinking water for initial three days and multivitamin preparation in boiled broken rice for five days were given to the ducklings as a precautionary measure to reduce early mortality. After ten days, the growing ducklings were allowed to graze in the premises of farmer house during which kitchen wastes, left over rice, chuffed vegetable peels, etc were offered as source of feed. Mostly the ladies

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of the families were looking after the growing ducklings for feeding, watering and watching during day time to protect them from wild cats, and other predators. Sometimes they were confining the ducklings inside fishing / mosquito nets for few hours during day time when kitchen wastes were offered. However, the ducklings were kept in fully secured night shelter and no feeding / watering was offered during night. Beyond six weeks of age, they were released to the ponds and water bodies of the village where ample sources of feeding were available for the ducks.

The data pertaining to body weight (g) at different age, mortality per cent up to 8th week, age at first egg (days), egg production (number) up to 40 week age and egg weight (g) at 40 weeks age were recorded (Table 1). It was not possible to record the weight of all the ducks supplied to the farmers every time as collecting all the birds from free range (Fig.1) was practically not possible always. Further, each farmer was provided with a note book and a pen to record the date of initiation of egg laying in his flock and subsequent egg production data. Simultaneously, the income generated through sale of egg and live ducks were also recorded by the farmer in the notebook. Thus, the source of data was the result of combined effort of both project team members as well as farmers family.

RESULTS AND DISCUSSION

Performances of the birds: The day old ducklings supplied to the farmers were monitored at farmers' level and few observations were recorded w.r.t. the performance of birds (Table 1). It was revealed that the rate of mortality was almost same as reported by Rashid *et al.* (1995) who studied the performance of Khaki Campbell, Deshi and their cross under rural condition in Bangladesh and little higher as reported by Das *et al.* (2008) for Deshi ducks in same country. However, Giri *et al.* (2014) reported much higher (20.76 and 21.08%) mortality rate (up to 8 weeks of age) in both Khaki Campbell and native ducks respectively reared by tribal farmers of Odisha state which might be due to the pure breed ducks supplied to the farmers for his study.

The present observation of body weight recorded from village level is higher than the corresponding values of Khaki Campbell and native ducks reared by tribals of Odisha under backyard system of management as reported by Giri *et al.* (2014). Also the pre-egg laying body weight recorded by Das *et al.* (2003) for Indian Runner, Khaki Campbell and Zending ducks under integrated system of management in aquaculture with provision of partial feeding is lower than the 16th week body weight of ducks in the present study where no commercial / supplementary feed was offered. The higher growth observed in the present study might be attributed to the genetic conformation of the birds through cross-breeding of a meat and an egg variety duck.

The average age at first egg of the ducks for all the farmers observed in the present study is in close proximity with Khaki Campbell ducks reared under extensive management (Das *et al.* 2008, Giri *et al.* 2014) and much less than Khaki Campbell birds maintained in Bangladesh as reported by Rashid *et al.* (1995). The egg production up to 40th week calculated on the basis of duck village is less than that observed by Giri *et al.* (2014) for Khaki Campbell and native ducks in tribal villages of Odisha and also less to the observation of Padhi *et al.* (2010) for the White Pekin ducks maintained in farm under intensive



Fig. 1. Crossbred ducks under extensive management.

Table 1. Performance of cross-bred ducks (WP × KC) in farmer's field

Parameter	Village 1	Village 2	Village 3	Overall
No of day old ducklings supplied	50	50	50	150
Mortality up to 8 week age (%)	12 (06)	20 (10)	04 (02)	12 (18)
Body wt (g) (combined sex)				37.02±0.32
Day old				
4 th wk	582.15±22.75	541.66±19.82	603.62±23.18	577.69±15.88
8 th wk	1037.36±26.86	1059.35±30.34	1111.36±25.66	1065.31±16.36
16 th wk	1631.86±64.51	1807.60±55.47	1835.95±53.25	1763.33±35.17
24 th wk	1774.25±75.10	1930.16±61.95	1823.68±55.97	1840.64±36.30
Age at first egg of the flock (days)	141	157	153	150.33
Number of female ducks in village at 20 th week	23	18	26	67
Egg production up to 40 th wk (As recorded by farmer family)	1107	972	1357	3436
Duck house/village egg production up to 40 wk age (%)	48.13	54.05	52.19	51.28
Egg weight (g) on 40 th wk SE Mean ± (No. of eggs)	57.50±1.07 (20)	60.00±0.77 (34)	58.21±0.75 (39)	59.43±0.50 (93)

Figures in parenthesis indicates numbers.

Table 2. Economics of production in farmer's field

Parameter	Farmers Income / Expenditure (₹)						Avg (₹)
	1	2	3	4	5	6	
Sale of male ducks	2825 (10)	3015 (11)	2640 (9)	3620 (13)	2450 (8)	3700 (14)	3042
Sale of eggs	3852 (433)	4760 (507)	3820 (412)	2813 (296)	4998 (523)	5012 (567)	4209
Sale of female birds	2850 (9)	3170 (11)	3275 (10)	2430 (07)	3450 (12)	3720 (12)	3149
Total Income (₹)	9527	10945	9735	8863	10898	12432	10400
Total expenditure (₹) (cost of day old ducklings @ 20/-)	500	500	500	500	500	500	500
Profit (₹)	9027	10445	9235	8363	10398	11932	9900

Figures in parenthesis indicate numbers.

rearing with provision of commercial feed. The egg weight (on 40th week) observed in the present study is much less than that reported by Galic *et al.* (2019) who raised White Pekin ducks in free range and also lower than that observed by Padhi *et al.* (2010) for White Pekin ducks (40th wk) maintained in farm condition. Further, the present observation of egg weight corroborates with the findings of Kavita *et al.* (2017) who reported the egg weight of White Pekin ducks for their second year of production in Tamil Nadu. However, the present observation of egg weight is found less than the 30th wk egg wt of Khaki Campbell ducks maintained by tribals in free range (Giri *et al.* 2014) which might be due to the fact that feeding sources available in the tribal villages are much better than that available in the villages taken in the present study.

Economics calculation: During the experiment, attempts were made to collect data from the individual farmer w.r.t. the income and expenditure involved during the practice of duck rearing. Individual farmers were given a note book and pen to note down the mortality, first day of egg production, number of male and female ducks in the flock, sale / own consumption of live bird (both male and female), egg production record (up to 40 weeks age) and income generated through sale of eggs and birds. The data thus generated was compiled and analysed for the economics involved in extensive duck production (Table 2).

Observation revealed that first income generated by farmers was through sale of male ducks (live) for human consumption. Similarly eggs are sold for ₹8 to 10 at different time by the farmers. The farmers also reported that few eggs and ducks were consumed by their family. Therefore, the average net profit earned by the farmer was ₹9900 (calculated) after deducting the cost of day old ducklings (@₹20 each). The cost of housing, labour and feeding from household were not taken into consideration for economics calculation in the present study. Srinivasan (2020) reported that the economics of duck rearing worked out to ₹7500 per month for 500 birds unit under semi-intensive rearing in Tamil Nadu which is less than the present finding where ducks were disposed at the age of 40 weeks. The profit would have been more if the ducks were maintained for a full production year. The higher income observed in the present study might be due to the

growth and production potentiality of the cross-bred ducks and were reared without any commercial feed. However, reports of income generated on free range duck rearing are very much scanty and not available at the present time. Thus, it may be concluded that cross-bred (WP×KC) ducks are suitable for rearing in farmers' field with a higher economic gain.

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