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Economic Traits in Native Birds of Gulbarga Division under Farm Conditions

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Abstract

This study was carried out to document the economic traits in native birds of Gulbarga division under farm conditions. The average weekly feed consumption and body weights were recorded and FCR was estimated, the FCR was 3.14, 3.16 and 3.26 in birds of Bidar, Gulbarga and Koppala districts, respectively. The average age at sexual maturity, body weight at sexual maturity and egg weight at sexual maturity were 178.25±5.89 days, 1097.00±12.83 gms and 30.85±0.11 gms, respectively. The per cent fertility, per cent hatchability on total eggs set and per cent hatchability on fertile eggs set were 90.33±0.31, 80.58±0.67 and 89.02±0.80, respectively. The average hen housed egg production were 41.30±1.82, 36.54±2.43 and 50.68±2.23, and survivor's egg production were 53.08±6.32, 53.64±5.44 and 55.78±4.12 in birds of Bidar, Gulbarga and Koppala districts, respectively at 52nd week of age. The mortality rate (percentage) was recorded and it was 5.38, 9.88 and 7.17 in day one – 8th week (Chick stage), 9-18th week (Grower stage) and 19-52nd week of age (Layer stage). This study revealed distinctive variations in economic traits among the birds of three districts of Gulbarga division, providing the basis for proper selection and development of improved backyard stains.

Key words *: Native birds, characterization, feed conversion ratio, sexual maturity, fertility, hatchability.*

Introduction

The farmers having indigenous poultry are capable of contributing significantly to alleviate malnutrition, poverty and unemployment. There is significant diversity observed in productive performance or these birds. There is a need to study and characterize the native breeds with respect to economic traits as they are gold mines of genomes and major genes for improvement of high yielding germplasm for tropical adaptability and disease resistance. The backyard poultry production constitutes vital component of agricultural economy in India since many years. The organized sector of poultry industry is contributing nearly 67 per cent of the total output and the rest 33 per cent by the unorganized sector. In unorganized poultry sector, the birds are reared in free range extensive system with very little input in the form of grains or farm by-products, birds have to scavenge limited amount of feed resource. The productive output of these birds are very low (60-70 eggs per bird per annum; 2.0 kg in males and 1.5 kg. in females).The eggs and the meat of these birds fetches premium price due to high consumer preference in the urban areas. The conservation of these breeds will act as source of variation for development of backyard poultry strains in India. Systematic studies on economic traits of indigenous birds in Karnataka have been studied in Mysore and Bangalore divisions. Hence, this study was designed to evaluate the productive performance in native birds of Gulbarga division (Bidar, Gulbarga and Koppala district) under farm conditions and to compare the same with documented native birds of Karnataka.

Materials and Methods

This study was carried out to document the productive performance of native birds of Gulbarga division under farm conditions. The fertile eggs were collected from twenty villages in each district (Bidar, Gulbarga and Koppala) for a period of seven days and were transported safely to Veterinary College, Bengaluru. The collected eggs were incubated in the standard forced draft incubators at department of poultry science. A total of 595 chicks were wing banded and housed in the brooder cum grower house under deep litter system. The standard rearing practices were followed. At 19th week, 296 females were shifted to breeder house. In each pen 16 females and 2 males were housed. The experiment was carried out up to 52nd week of age. The birds were fed starter ration from zero to eight weeks of age, grower diet from 9-18 weeks of age and breeder ration from 19-52 weeks of age.

The body weights of birds were recorded weekly from day of hatching to 52nd week of age. Average weekly feed consumption was recorded and FCR was calculated from day old to 8 weeks of age. The weekly feed conversion ratio was estimated as the ratio of the amount of feed consumed for unit gain in body weight during a particular week. The average period in days from the date of hatch to date of first egg laid was calculated as age at

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sexual maturity. The body weight of the bird was recorded in gms soon after the first egg was laid. The weight of the first egg was also recorded in gms. The number of eggs laid by each bird from the day of 1st egg up to 52nd week of age was recorded and classified into Hen housed egg production and Survivor's egg production. The per cent fertility is estimated as the ratio of number of fertile eggs to the total number of eggs and which is multiplied by 100. The per cent hatchability on TES is the ratio of number of chicks obtained to the total number of eggs set and which is multiplied by 100, similarly the per cent hatchability on FES is the ratio of number of chicks obtained to the total number of fertile eggs set and which is multiplied by 100. Mortality was recorded from day one to the last day of 52nd week of age and classified for the periods from 0th day to 8th week, 9 to 18th week and 19 to 52nd week of age separately and expressed as percentage. Data collected were subjected to simple descriptive analysis using SPSS statistical package.

Results and Discussion

Feed Conversion Ratio (FCR) : Average weekly feed consumption and feed conversion ratio up to eight weeks of age are presented in the Table-1. The feed conversion ratio (FCR) of indigenous chicken recorded in this study at the end of 1st, 2nd, 3rd, 4th, 5th, 6th, 7th and 8th weeks were 0.64, 1.35, 1.76, 2.13, 2.51, 2.78, 2.98 and 3.14 in birds of Bidar district and 0.53, 1.34, 1.82, 2.23, 2.45, 2.59, 2.86 and 3.16 in birds of Gulbarga district and 0.51, 1.26, 1.67, 2.05, 2.46, 2.81, 2.95 and 3.20 in birds of Koppala district, respectively. Comparatively better FCR were recorded by (1) and (2) than the present study. Poor FCR was reported in native birds of Belagaum division by (3) than the present study. The FCR was comparatively poor in the present study when compared with other native birds; since the studied birds have the habit of spilling the feed from the feeder into the litter and hence resulting in substantial wastage of feed.

Age at sexual maturity (days), Body weight at sexual maturity (g) and Egg weight at sexual maturity (g) : Age at sexual maturity (ASM), Body weight at sexual maturity (BWSM) and Egg weight at sexual maturity (EWSM) are presented in Table 2. The average age at sexual maturity (ASM) documented were 174.79±0.65, 190.03±18.39 and 169.13±0.74 days in native birds of Bidar, Gulbarga and Koppala districts, respectively. The overall ASM reported was 178.25±5.89 days. There was no significant (*p=0.05*) difference observed in age at sexual maturity among the birds of three districts. Lower ASM than the present study was recorded by in indigenous chicken of Mysore division (165.62±1.34 days). The body weight at sexual maturity recorded in the present study was 1074.85±14.90 gms in birds of Bidar district, 1017.38±19.20 gms in birds of Gulbarga and 1236.40±31.16 gms in birds of Koppala district. The overall average body weight at sexual maturity recorded from all the three districts was 1097.00±12.83 gms. Birds of Koppala district showed significantly (*p=0.05*) higher BWSM than the birds of Bidar and Koppala districts. The present results of BWSM were higher than (4) in indigenous chicken of Mysore division and (2) in indigenous chicken of Bangalore division. The average egg weight at sexual maturity recorded were 30.98±0.17 gms, 30.64±0.20 gms and 30.87±0.21 gms in birds of Bidar, Gulbarga and Koppala districts, respectively. The overall egg weight at sexual maturity was 30.85±0.11 gms. Average egg weight at sexual maturity showed no significant difference (p=0.05) among the birds of three districts of Gulbarga division. The present finding was in accordance with the report of (1) in indigenous chicken of Mysore division. However, the higher egg weight was documented by (2) in indigenous chicken of Bangalore division.

Per cent fertility and Hatchability : Fertility and hatchability percentages in native birds of Gulbarga division are presented in Table 3. The fertility and hatchability are influenced by the breed, nutrition, age and management of birds. The per cent fertility recorded in the present study were 57.74, 54.65, 49.79 and 54.06 in birds of Bidar, Gulbarga, Koppala districts and overall studied area, respectively at field conditions. Similarly, the per cent fertility recorded were 89.40±0.51, 90.17±0.53, 91.41±0.56 and 90.33±0.31 in birds of Bidar, Gulbarga, Koppala districts and overall studied area, respectively at farm conditions. (3) recorded fertility rate of 89.38±1.04 in birds of Chikkaballapur, 90.42±0.82 in birds of Bangalore Rural and 89.27±0.96 in birds of Ramanagar district and 89.69±0.54 in birds of overall studied area at farm conditions.

The hatchability per cent on total eggs set basis in present study were 34.19, 42.63, 34.10 and 36.97 in birds of Bidar, Gulbarga, Koppala districts and overall studied area, respectively at field conditions and at farm conditions were 78.61±1.08, 80.04±1.17, 83.09±1.17 and 80.58±0.67 in birds of Bidar, Gulbarga and Koppala districts and overall studied area, respectively. (4) recorded hatchability of 84.4 per cent in Ankleshwar breed and (5) reported hatchability of 82.56±0.85 per cent in native chicken of Assam. The per cent hatchability on fertile eggs set was 59.21, 78.01, 68.48 and 68.56 in birds of Bidar, Gulbarga, Koppala districts and overall studied area, respectively at field conditions and at farm conditions were 87.77±0.81, 88.58±0.87, 90.72±0.80 and 89.02±0.80 in birds of Bidar, Gulbarga and Koppala districts and overall studied area, respectively. (1) reported

Table-1 : Average weekly feed consumption and feed conversion ratio of native birds of Gulbarga division.

Age (wks)	Weekly feed consumption (g)			Feed conversion ratio		
	Bidar	Gulbarga	Koppala	Bidar	Gulbarga	Koppala
1	24.88	21.75	21.44	0.64	0.53	0.51
2	59.65	62.79	61.47	1.35	1.34	1.26
3	85.15	87.23	87.27	1.76	1.82	1.67
4	107.24	108.78	114.31	2.13	2.23	2.05
5	159.56	168.38	172.22	2.51	2.45	2.46
6	215.99	225.33	242.27	2.78	2.59	2.81
7	257.59	255.14	277.37	2.98	2.86	2.95
8	273.92	280.63	310.13	3.14	3.16	3.26

Table-2 : Age at sexual maturity (ASM), Body weight at sexual maturity (BWSM) and Egg weight at sexual maturity (EWSM).

Districts	ASM^{NS} (days)	BWSM (gm)	EWSM^{NS} (gm)
Bidar	174.79 ± 0.65	1074.85 ± 14.90^{b}	30.98 ± 0.17
Gulburga	190.03 ± 18.39	1017.38 ± 19.20^{b}	30.64 ± 0.20
Koppala	169.13 ± 0.74	1236.40 ± 31.16^{a}	30.87 ± 0.21
Overall Average	178.25 ± 5.89	1097.00 ± 12.83	30.85 ± 0.11

Means with different superscripts (a,b,c…) columnwise indicate significant difference (p=0.05).

Table-3 : Fertility and hatchability percentages in native birds of Gulbarga division.

Districts	Fertility	Hatchability on TES	Hatchability on FES
Bidar	89.40 ± 0.51^{b}	78.61 ± 1.08^{b}	87.77 ± 0.81^{b}
Gulbarga	90.17 ± 0.53^{ab}	80.04 ± 1.17^{ab}	88.58 ± 0.87^{ab}
Koppala	91.41 ± 0.56^{a}	83.09 ± 1.17^{a}	90.72 ± 0.80^{a}
Overall	90.33 ± 0.31	80.58 ± 0.67	89.02 ± 0.80

Means with different superscripts (a, b, c…) columnwise indicate significant difference (p=0.05).

Table-4 : Hen housed egg production (HHEP) and Survivor's egg production (SUEP) at 52nd week.

District	HHEP	SUEP
Bidar	41.30 ± 1.82	53.08 ± 6.32
Gulbarga	36.54 ± 2.43	53.64 ± 5.44
Koppala	50.68 ± 2.23	55.78 ± 4.12

Table-5 : Mortality rate (%) in native birds of Gulbarga division.

Period	Bidar	Gulbarga	Koppala	Overall
Day one – 8th wk (Chicks)	3.77	5.00	7.36	5.38
9-18th wk (Grower)	5.80	17.22	6.62	9.88
19-52nd wk (Layers)	6.77	6.93	7.8	7.17

HFES of 76.97 per cent in indigenous birds of Mysore division and (2) reported 82.21±1.76 per cent in indigenous birds of Bangalore division. Hatchability of eggs from the scavenging local chicken could be affected by a number of factors including age of the hen and cock, type of nesting, season and number of eggs incubated by the hen. The variations in hatchability might be due to the differences in age of the birds and environmental conditions.

Hen housed and survivor's egg production : Hen housed egg production (HHEP) and Survivor's egg production (SUEP) at 52nd week of age are presented in Table 4. The average hen housed egg production (HHEP) upto 52 weeks of age recorded in the present study were 41.30±1.82, 36.54±2.43 and 50.68±2.23 in birds of Bidar, Gulbarga and Koppala districts, respectively. (1) recorded 44.19±5.24 eggs in indigenous birds of Mysore division and (3) recorded 57.86±1.92 eggs in indigenous birds of Belagaum division. The lower egg production in the present study inspite of improved management conditions could be attributed to the fact that the birds under study were recently introduced to captive conditions and birds were not acclimatized to the new environment. The prominent broodiness character might be one of the primary reasons for lower production in these birds.

The survivor's egg production (SUEP) recorded in present study was 53.08±6.32, 53.64±5.44 and

55.78±4.12 in birds of Bidar, Gulbarga and Koppala districts, respectively. The results of the present study are in proximity with the findings of (6) in Daothgiri birds (50-60 eggs), (4) in Ankleshwar birds (79.35 eggs) and (3) in indigenous birds of Belagaum division (59.37±2.19 eggs). The egg production being a quantitative trait can easily be influenced by environment and the genetic makeup of the birds. It is well established that egg production is negatively correlated with age at first egg, length of broodiness and length of pause. The differences in average age at first egg, egg weight and egg production could be due to differences in genetic makeup of different breeds, agro climatic conditions, nutrition and managemental practices. Egg production and broodiness traits are negatively correlated and hence, lesser egg production was noticed in Gulbarga division birds. However, broodiness trait in native chickens is a desirable trait under field conditions for self- multiplication and therefore this trait needs to be maintained.

Mortality rate (%) : Mortality rates (%) in native birds of Gulbarga division are presented in Table 5. The per cent mortality recorded from day old to eight weeks in indigenous birds were 3.77, 5.00 and 7.36 in birds of Bidar, Gulbarga and Koppala districts, respectively. The overall average mortality in birds of entire division was 5.38 per cent. The per cent mortality recorded from 9-18 weeks were 5.80, 17.29 and 6.62 in birds of Bidar, Gulbarga and Koppala districts, respectively and the overall per cent mortality in birds of entire division was 9.8. The per cent mortality recorded from 19-52 weeks laying period was 6.77, 6.93 and 7.8 in Bidar, Gulbarga and Koppala districts, respectively. The findings of present study were in agreement with (1) in indigenous birds of Mysore division, (2) in indigenous birds of Bangalore division and (3) in indigenous birds of Belagaum division.

Conclusions

This study reveals variability in economic traits among the birds of Gulbarga division which is affected by both genetic and environmental factors. Considering the hardy nature and productive performance of these birds, these have vast potential for development of improved backyard strains. There was great difference in percent fertility and hatchability between field and farm conditions; hence there is scope for improvisation of these traits at field conditions.

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