

Original Research Article

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Performance Evaluation of Indigenous Chicken of Belagaum Division of Karnataka State, India

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ABSTRACT

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A study was undertaken to evaluate the indigenous chicken of Belagaum division of Karnataka State, India for performance and morphological characters pertaining to three districts namely; Bijapur, Belagaum and Dharawad, both under field conditions and under farm conditions. Survey was conducted in three districts and the data was recorded as per NBAGR proforma. The evaluation of birds under farm conditions revealed that, the body weight of birds belonging to Bijapur and Belagaum were significantly higher at all age groups compared to Dharawad district. Significant differences were noticed in hen housed egg production and in survivor's egg production up to 52 weeks of age. The birds of Bijapur district showed good survivability compared to other two districts. The birds of all the three districts under study showed very good ELISA titres against New Castle disease at all the stages of life.

Introduction

India is very rich in biodiversity and almost all the animal species are available in India with a large variability within species. India is one of the richest poultry genetic resource countries in the world having 19 indigenous breeds and various subtypes among the 72 breeds found in Asia. The indigenous chicken is a store house of genetic diversity along

with a number of genomes and major genes of tropical relevance. India and neighbouring countries are considered to be the native tract of Red Jungle Fowl (*Gallus gallus*) from which the present day domestic birds have been descended.

Systematic studies on morphological characters and the economic traits of indigenous chicken in Karnataka have been

studied in Mysore and Bangalore divisions. Hence, study was undertaken in indigenous chicken of Belgaum division of Karnataka and their production potential under farm condition. Conservation of these breeds will act as source of variation for future poultry improvement.

Materials and Methods

The present study was carried out to characterize and classify the Indigenous chicken pertaining to three districts of Belagaum division of Karnataka state, India based on morphological features and to evaluate production performance under farm conditions. The study included two parts I. Survey study and II. Evaluation under farm conditions.

The study was carried out in the Veterinary College Shivamogga and Bangalore with an objective to study the production performance of Indigenous chicken under farm conditions. The hatching eggs from twenty villages in each taluka were procured daily for a period of seven days, coded district wise, transported and incubated in the standard forced draft incubator at the college hatchery, Shivamogga. Fertility, hatchability on total egg set and on fertile egg set were recorded.

A total of 1979 chicks were wing banded district wise and individually weighed to the accuracy of 1 gm and housed in brooder cum grower house under deep litter system. The standard rearing practices were followed. The chicks were fed *ad libitum* feed up to 8 weeks of age (diet was formulated as per BIS). During Grower stage from 9 to 18 weeks of age grower diet was fed at the rate of 80 gm per bird. During the layer stage from 19 to 52 weeks of age breeder ration was provided at the rate of 100 gm per bird. The birds were reared up to 52 weeks of age under farm conditions. The feed conversion ratio (FCR)

was expressed as the ratio of amount of feed consumed to the unit gain in body weight at a given age. Average daily, weekly feed consumption was recorded for each district and FCR was calculated from 0 to 8 weeks. The mortality percentage was recorded from day one to 8 weeks of age, nine to eighteen weeks and nineteen to fifty two weeks of age. Data collected were subjected to statistical analysis using SPSS package.

Results and Discussion

Body weight profile from Day old to 4th week of age (Table 1)

In the present study, the average mean body weight at day old in Belagaum division was 27.18 ± 0.16 gm. The results are in agreement with Rajakumar (2013) in indigenous chicken of Bangalore division of Karnataka (27.70 ± 0.15 gm) and Gopinath (2013) in indigenous chicken of Mysore division of Karnataka (25.75 ± 0.24 gm). Sharma (1995) for Native fowl of Mizoram, Haunshi *et al.*, (2009) in Miri breed of chicken, Haunshi *et al.*, (2011) in Kadakanath breed of chicken and Faruque *et al.*, (2010) in non-descript birds of Bangladesh reported similar findings. Haunshi *et al.*, (2011) recorded higher body weight in Aseel birds. Thakur and Parmar (2011) also recorded higher values than that obtained in the present study. The lower weight recorded at hatching could be attributed to weight of eggs collected from different places.

The average mean body weight at 1st week of age in indigenous chicken of Belagaum division of Karnataka was 38.43 ± 0.17 gm. Similar findings were reported by Gopinath (2013) in indigenous chicken of Mysore division of Karnataka (35.28 ± 0.31 gm), Rajakumar (2013) in indigenous chicken of Bangalore division of Karnataka (45.71 ± 0.36 gm), Haunshi *et al.*, (2009) in Miri breed of

chicken, Thakur *et al.*, (2006) and Thakur and Parmar (2011). The average mean body weight at 2nd week of age in indigenous chicken of Belagaum division of Karnataka was 62.67 ± 0.33 gm. Reports were similar to that of Rajakumar (2013) in Bangalore division of Karnataka (66.49 ± 0.46 gm) and Gopinath (2013) in indigenous chicken of Mysore division of Karnataka (58.34 ± 0.72 gm).

Haunshi *et al.*, (2009) documented higher body weight in Aseel breed of chicken and in Kadakanath breed of chicken. Lower body weight was recorded in Miri breed of birds by Haunshi *et al.*, (2009).

The average mean body weight at 3rd week of age in indigenous chicken of Belagaum division of Karnataka was 98.49 ± 0.48 gm. Rajakumar (2013) reported higher body weight in indigenous chicken of Bangalore division of Karnataka (100.56 ± 1.08 gm). Lower body weight than the present study were reported by Gopinath (2013) in indigenous chicken of Mysore division of Karnataka (86.88 ± 1.36 gm) and Haunshi *et al.*, (2009) in Miri type of chicken.

The average mean body weight at 4th week of age in indigenous chicken of Belagaum division of Karnataka was 145.54 ± 1.45 gm. Rajakumar (2013) reported similar findings in indigenous chicken of Bangalore division of Karnataka (144.49 ± 1.87 gm). Sharma (1995) in Native chicken of Mizoram and Haunshi *et al.*, (2011) in Aseel breed of chicken reported similar findings.

Lower value than the present study were reported by Gopinath (2013) in Indigenous chicken of Mysore division of Karnataka (134.34 ± 2.61 gm), Chatterjee *et al.*, (2002) in Nicobari breed of chicken, Haunshi *et al.*, (2009) in Miri breed and Haunshi *et al.*, (2011) in Kadakanath breed of chicken.

Body weight profile of Indigenous chicken of Belagaum division from 5th to 12th week of age (Table 2)

The average mean body weight at 5th week of age in indigenous chicken of Belagaum division of Karnataka was 237.13 ± 1.86 gm . Lower body weight than the present study were reported by Rajakumar (2013) in indigenous chicken of Bangalore division (217.63 ± 2.90 gm), Gopinath (2013) in indigenous chicken of Mysore division of Karnataka (190.01 ± 3.61 gm), Chaterjee *et al.*, (2002) in Nicobari Fowl and Haunshi *et al.*, (2009) in Miri type of chicken.

The average mean body weight at 6th week of age in indigenous chicken of Belagaum division of Karnataka was 322.52 ± 2.15 gm . Lower body weight than the present study were reported by Rajakumar (2013) in indigenous chicken of Bangalore division (300.27 ± 3.97 gm), Gopinath (2013) in indigenous chicken of Mysore division of Karnataka (274.23 ± 5.65 gm), Haunshi *et al.*, (2011) in Aseel breed of chicken, Chaterjee *et al.*, (2002) in Nicobari Fowl, Haunshi *et al.*, (2009) in Miri type , Haunshi *et al.*, (2010) in Aseel breed and Haunshi *et al.*, (2011) in Kadakanath breed .

The average mean body weight at 7th week of age in indigenous chicken of Belagaum division of Karnataka was 383.22 ± 2.52 gm. Higher body weight than the present study were reported by Rajakumar (2013) in indigenous chicken of Bangalore division (395.58 ± 5.24 gm). Lower body weight was reported by Gopinath (2013) in indigenous chicken of Mysore division (347.50 ± 6.42 gm), Chaterjee *et al.*, (2002) in Nicobari breed of chicken and Haunshi *et al.*, (2009) in Miri type of chicken. The average mean body weight at 8th week of age in indigenous chicken of Belagaum division of Karnataka was 491.20 ± 3.38 gm. Similar findings were

reported by Rajakumar (2013) in indigenous chicken of Bangalore division (492.99±6.79 gm). Lower body weights were reported by Gopinath (2013) in indigenous chicken of Mysore division (433.63±8.20 gm), Doley *et al.*, (2009) in indigenous chicken of North-Eastern region, Sharma (1995) in Native Fowl of Mizoram, Chatterjee *et al.*, (2002) in Nicobari fowl and Haunshi *et al.*, (2009) in Miri Type of Chicken. The higher body weights in the present study may be due to better management, nutrition and difference in the genetic make-up of birds.

The average mean body weight at 12th week of age in indigenous chicken of Belagaum division of Karnataka was 769.95 ±8.08 gm. Lower body weights than the present study were reported by Rajakumar (2013) in indigenous chicken of Bangalore division (745.96±9.50 gm), Gopinath (2013) in indigenous chicken of Mysore division of Karnataka (670.87±12.59 gm), Sharma (1995) in Native Fowl of Mizoram, Doley *et al.*, (2009) in indigenous chicken of North-Eastern region and Haunshi *et al.*, (2009) in Miri type of chicken . The overall body weight of Belagaum division had superior body weight in comparison to other Native breeds of chicken as reported by many Authors may be mainly due to better nutrition and management and the environmental conditions .

Body weight of males at 16th, 20th, 32nd, 40th and 52nd weeks of age (Table 3)

The average mean body weight at 16th week of age in indigenous chicken of Belagaum division of Karnataka was 1220.73 ±21.96 gm. Lower body weights than the present study were reported by Rajakumar (2013) in indigenous chicken of Bangalore division (1177.47±30.59 gm), Gopinath (2013) in indigenous chicken of Mysore division of Karnataka (1096.19 ±27.41 gm) and Thakur

et al., (2006) in Kadakanath breed of chicken. Higher body weights in the present study are attributable to genetic make -up, environmental factors and also good management under farm conditions.

The average mean body weight at 20th week of age in indigenous chicken of Belagaum division of Karnataka was 1616.93 ±7.59 gm. Lower body weights than the present study were reported by Rajakumar (2013) in indigenous chicken of Bangalore division (1370.16 ±31.44 gm), Gopinath (2013) in indigenous chicken of Mysore division of Karnataka (1308.02 ±32.57 gm), Thakur *et al.*, (2006) in Kadakanath breed and Haunshi *et al.*, (2009) in males of Miri type of chicken.

The average mean body weight at 32nd week of age in indigenous chicken of Belagaum division of Karnataka was 1932.27 ±9.50 gm. Higher body weight than the present study was reported by Rajakumar (2013) in indigenous chicken of Bangalore division (2139.05±62.95 gm). Lower body weight was reported by Gopinath (2013) in indigenous chicken of Mysore division of Karnataka (1887.38±52.67gm).

The average mean body weight at 40th week of age in indigenous chicken of Belagaum division of Karnataka was 1978.81 ±8.77 gm. Higher body weights than the present study were reported by Rajakumar (2013) in indigenous chicken of Bangalore division (2330.05±67.57 gm), Gopinath (2013) in indigenous chicken of Mysore division of Karnataka (2027.03±73.36 gm) and Haunshi *et al.*, (2010) in Aseel breed of chicken. Lower body weight was reported by Haunshi *et al.*, (2009) in Miri type of chicken.

The average mean body weight at 52nd week of age in indigenous chicken of Belagaum division of Karnataka was 2050.90±14.13 gm. Higher body weights than the present study

were reported by Rajakumar (2013) in indigenous chicken of Bangalore division (2604.83 ± 101.45 gm), Gopinath (2013) in indigenous chicken of Mysore division of Karnataka (2078.26 ± 84.46 gm). Lower body weights were reported by Doley *et al.*, (2009) in indigenous chicken of North- Eastern region of India and Haunshi *et al.*, (2010) in Kadakanath.

Body weight of females at 16th, 20th, 32nd, 40th and 52nd weeks of age (Table 4)

The average mean body weight at 16th week of age in indigenous chicken of Belagaum division of Karnataka was 978.60 ± 10.27 gm. Lower body weights than the present study were reported by Rajakumar (2013) in Bangalore division (900.69 ± 18.20 gm), Gopinath (2013) in Mysore division (824.4 ± 18.63 gm) and Thakur *et al.*, (2006) in Kadakanath.

The average mean body weight at 20th week of age in indigenous chicken of Belagaum division of Karnataka was 1060.30 ± 2.79 gm. Higher body weight than the present study was reported by Rajakumar (2013) in Bangalore division (1115.70 ± 23.41 gm). Lower body weights were reported by Gopinath (2013) in Mysore division (1014.71 ± 25.25 gm) and Thakur *et al.*, (2006) in Kadakanath.

The average mean body weight at 32nd week of age in indigenous chicken of Belagaum division of Karnataka was 1241.39 ± 3.50 gm. Higher body weight than the present study were reported by Rajakumar (2013) in Bangalore division (1447.20 ± 39.63 gm) and Gopinath (2013) in Mysore division (1303.48 ± 43.02 gm).

The average mean body weight at 40th week of age in indigenous chicken of Belagaum division of Karnataka was 1339.70 ± 1.63 gm.

Higher body weight than the present study were reported by Rajakumar (2013) in Bangalore division (1471.23 ± 43.66 gm), Gopinath (2013) in Mysore division (1387.35 ± 42.12 gm) and Haunshi *et al.*, (2010) in Aseel breed of chicken.

The average mean body weight at 52nd week of age in indigenous chicken of Belagaum division of Karnataka was 1372.78 ± 2.38 gm. Higher body weight than the present study were reported by Rajakumar (2013) in Bangalore division (1502.74 ± 43.98 gm), Gopinath (2013) in Mysore division (1418.04 ± 43.69 gm) and Mohan *et al.*, (2008a) in Aseel breed of chicken. The variation is attributable to differences in genetic make-up of different breeds.

Egg production profile of indigenous chicken of Belagaum division (Table 5 and Table 6)

The average hen housed egg production (HHEP) up to 52 weeks of age in the indigenous chicken of Belagaum division was 57.86 ± 1.92 eggs. Lesser egg production than the present study was reported by Rajakumar (2013) in Bangalore division (42.04 ± 2.77 eggs), Gopinath (2013) in Mysore division (44.19 ± 5.24 eggs), Doley *et al.*, (2009) in indigenous chicken of North East region (44.25 ± 0.91 eggs) up to 52 weeks of age. Mohan *et al.*, (2008) recorded higher egg production in Aseelpeela (160 eggs) and in Kadakanath birds (105 eggs). The lower egg production in the present study could be due to first generation of native birds of Belagaum division and also genetic make-up of birds. .

The average survivor's egg production (SEP) in the present study was 59.37 ± 2.19 eggs. Rajakumar (2013) reported in Bangalore division as 55.91 ± 3.67 eggs. Gopinath (2013) reported higher SEP than the present study as 70.42 ± 8.66 eggs. Vij *et al.*, (2006b) recorded

60 to 70 eggs in Daothigir, Tantia *et al.*, (2006a) recorded 79.35 in Ankaleshwar and Iqbal and Pampori (2008) recorded 75 to 90 in indigenous chicken of Kashmir. Viji *et al.*, (2006) reported higher eggs of 148.7 per year in Nicobari birds. Sunder *et al.*, (2005) reported 165.20±5.37, 155.30±5.50 and 142.15±3.17 eggs for White, Black and Brown Nicobari fowls, respectively. Egg production is a quantitative trait and it is influenced by genetic make-up as well environmental conditions. The differences could be due to differences in genetic make-up, climatic conditions, nutrition and management practices adopted in the present study. .

The feed consumed per dozen of eggs in the present study was 4.48±0.16 kg. Results are similar to Rajakumar (2013) in Bangalore division (4.48±0.35 kg) and Gopinath (2013) in Mysore division (4.14±0.45 kg). Sunder *et al.*, (2005) recorded 2.70, 2.64 and 2.84 kg per dozen of eggs in White, Black and Brown Nicobari birds respectively.

FCR up-to 8th week of age in indigenous chicken of Belagaum division was 2.73. Similar findings were reported by Rajakumar (2013) in indigenous chicken of Bangalore division of Karnataka (2.70). Lower FCR was reported by Gopinath (2013) in indigenous chicken of Mysore division (2.36), Chaterjee *et al.*, (2002) in Nicobari fowl and Haunshi *et al.*, (2009) in Miri type of birds than the present study.

Mortality (Table 7)

The average mortality percentage recorded in Belagaum division of Karnataka at 8th week of age was 6.91 %. Lower value than the present study was reported by Rajakumar (2013) in Bangalore division (6.00 %), Gopinath (2013) in Mysore division (6.56%), Tantia *et al.*, (2005a) in Kashmir Favoralla

chicken and Khan *et al.*, (2009) in indigenous chicken of Kashmir. Higher mortality was reported by Vij *et al.*, (2005) in Danki breed of chicken. The average mortality percentage recorded in Belagaum division of Karnataka at 9th to 18th weeks of age was 4.95 %. Higher mortality was reported by Gopinath (2013) in indigenous chicken of Mysore division (7.71 %), Rajakumar (2013) in indigenous chicken of Bangalore division (14.89%) and Al-Yousef (2007) in Saudi Baladi native chickens.

The average mortality percentage recorded in Belagaum division of Karnataka from 19th to 52nd weeks of age was 7.35 %. Higher mortality was reported by Gopinath (2013) in indigenous chicken of Mysore division (36.25%), Rajakumar (2013) in indigenous chicken of Bangalore division (26.73%), Gupta *et al.*, (2006) indigenous chicken of Meghalaya, Khan *et al.*, (2009), Doley *et al.*, (2009) in indigenous chicken of North (14.35±1.02 %) up to 52nd weeks of age. The present study reported lesser percentage of mortality in growers and also in layers compared to other literature available in this study. .

Humoral immune response against New castle disease virus (NDV) (Table 8)

The average ELISA titers (Log₂) in the indigenous chicken of Belagaum division were, at day old (2.98±0.01), at 28th day post F1 vaccination (3.26±0.13), at 49th day post Lasota vaccination (3.43±0.13), at 105th day post R2B vaccination (3.67±0.17) and at 154th day post R2B + IB killed vaccination (3.71±0.01). The present study indicates that the native birds of Belagaum division evaluated for immune response by ELISA method to NDV showed better antibody response at 154th day or at 22nd week post R2b +IB killed vaccination.

Table.1 Body Weight (gms) of indigenous chicken from Day old to 4th week of age in Belagaum division (farm Conditions)

District	N	Day old	N	1 st Week	N	2 nd Week	N	3 rd Week	N	4 th Week
Bijapur	672	28.55± 0.16 ^b	662	41.06 ± 0.33 ^b	654	64.51 ± 0.58 ^b	649	99.87 ± 0.71 ^b	644	151.87± 3.60 ^b
Belagaum	699	26.56± 0.40 ^a	684	37.29± 0.26 ^a	676	59.66 ± 0.48 ^a	670	95.85 ± 1.03 ^a	665	139.17± 1.63 ^a
Dharawad	608	26.41± 0.18 ^a	598	36.85 ± 0.28 ^a	593	64.09 ± 0.66 ^b	588	99.98± 0.66 ^b	585	145.83 ± 1.68 ^{ab}
Pooled Mean	1979	27.18 ± 0.16	1944	38.43 ± 0.17	1923	62.67 ± 0.33	1907	98.49 ± 0.48	1894	145.54 ± 1.45

Means bearing at least one common superscript within a column not differ significantly (P≤0.05)

Table.2 Body Weight (gms) of indigenous chicken from 5th week to 12th week age in Belagaum division (farm Conditions)

District	N	5 th Week	N	6 th Week	N	7 th Week	N	8 th Week	N	12 th week
Bijapur	641	249.64± 2.73 ^b	639	337.40 ± 3.31 ^b	637	419.22 ± 3.55 ^b	632	506.76 ± 6.72 ^b	235	791.15 ± 13.65 ^b
Belagaum	657	231.67±2.32 ^a	650	297.70 ± 3.03 ^a	648	366.74 ± 3.21 ^a	645	503.70 ± 4.89 ^b	233	735.54 ± 13.21 ^a
Dharawad	580	229.49± 4.47 ^a	573	334.10 ± 4.64 ^b	570	361.73± 5.90 ^a	564	459.49± 5.01 ^a	235	782.88 ± 14.87 ^b
Pooled Mean	1878	237.13 ± 1.86	1862	322.52 ± 2.15	1855	383.22 ± 2.52	1841	491.20 ± 3.38	703	769.95 ± 8.08

Means bearing at least one common superscript within a column not differ significantly (P≤0.05)

Table.3 Body weight (gms) of indigenous chicken (males) at different weeks of age in Belagaum division (Farm conditions)

District	N	16 th Week	N	20 th Week	N	32 nd Week	N	40 th Week	N	52 nd week
Bijapur	80	1185.05±37.33	24	1669.04± 9.20 ^b	24	1993.33± 8.33 ^c	24	2102.92±11.54 ^c	24	2132.50±17.20 ^c
Belagaum	70	1263.20±35.18	24	1604.17±10.62 ^a	24	1935.58±12.79 ^b	24	1948.33± 5.74 ^b	24	2041.46±10.33 ^b
Dharawad	38	1217.63±37.16	24	1577.58±11.99 ^a	24	1867.92±16.15 ^a	24	1885.21± 9.03 ^a	24	1978.75± 7.39 ^a
Pooled Mean	188	1220.73±21.96	72	1616.93±7.59	72	1932.27±9.50	72	1978.81±8.77	72	2050.90±14.13

Means bearing at least one common superscript within a column not differ significantly (P≤0.05)

Table.4 Body weight (gms) of indigenous chicken (females) at different weeks of age in Belagaum division (Farm conditions)

District	N	16 th Week	N	20 th Week	N	32 nd Week	N	40 th Week	N	52 nd week
Bijapur	170	970.08±16.73	136	1063.43±4.92	135	1259.99±6.07 ^c	132	1360.02±3.23 ^c	130	1419.63±3.13 ^c
Belagaum	178	964.89±19.61	136	1063.38±4.29	130	1223.33±6.08 ^a	125	1341.08±1.91 ^b	122	1361.83±2.90 ^b
Dharawad	183	999.91±16.85	136	1054.11±5.25	135	1240.19±5.71 ^b	131	1317.92±1.64 ^a	126	1335.05±1.67 ^a
Pooled Mean	532	978.60±10.27	408	1060.30±2.79	400	1241.39±3.50	388	1339.70±1.63	378	1372.78±2.38

Means bearing at least one common superscript within a column not differ significantly (P≤0.05)

Table.5 Egg production and Feed consumption profile of indigenous chicken up to 52 weeks of age in birds of Belagaum division (under farm conditions)

District	N	Feed(kg) per dozen of Eggs	Hen housed egg production(HHEP)	Survivor egg production(SEP)
Bijapur	8	4.87±0.35 ^b	53.42±3.35 ^a	54.38±3.77 ^a
Belagaum	8	3.97±0.19 ^a	64.33±2.88 ^b	66.13±3.82 ^b
Dharawad	8	4.60±0.26 ^{ab}	55.84±2.76 ^{ab}	57.61±2.84 ^{ab}
Pooled mean	24	4.48±0.16	57.86±1.92	59.37±2.19

Means bearing at least one common superscript within a column do not differ significantly (P≤0.05)

Table.6 Average daily, weekly feed consumption, Feed conversion ratio (FCR) and Mortality of indigenous chicken of Belagaum Division (under farm conditions)

Age (wk)	Daily feed consumption(gm)			Weekly feed consumption(gm)			Feed conversion ratio(FCR)			Mortality (%)		
	Bijapur	Belagaum	Dharawad	Bijapur	Belagaum	Dharawad	Bijapur	Belagaum	Dharawad	Bijapur	Belagaum	Dharawad
1	3.39	3.75	4.14	23.75	26.25	29	0.58	0.71	0.79	1.49	2.15	1.64
2	5.46	5.75	6.25	38.25	40.25	43.75	0.97	1.12	1.14	2.68	3.29	2.47
3	7.57	9.04	9.14	53	63.25	64	1.16	1.37	1.38	3.42	4.15	3.29
4	13.71	15	14.14	96	105	99	1.44	1.68	1.63	4.17	4.86	3.78
5	25.64	25.43	24.14	179.5	178	169	1.60	1.79	1.78	4.61	6.01	4.61
6	35.07	35.57	34.14	245.5	249	239	1.90	2.25	1.96	4.91	7.01	5.76
7	45.28	44.71	43.29	317	313	303	2.29	2.69	2.66	5.21	7.30	6.25
8	52.89	53.86	52	370.25	377	364	2.64	2.71	2.84	5.95	7.73	7.07

Table.7 Mortality (%) at different weeks of age in Indigenous chicken of Belagaum division (under farm conditions)

District	1-8 weeks (chicks)	9-18 weeks (Growers)	19-52 weeks (Layers)
Bijapur	5.95	4.25	4.41
Belagaum	7.73	5.65	10.29
Dharawad	7.07	4.95	7.35
Overall mean	6.91	4.95	7.35

Table.8 ELISA titer value (Log₂) against Newcastle disease at pre and post vaccination periods of indigenous chicken (under farm conditions)

District	N	Day old (maternal)	28 th day (post F1)	49 th day (post Lasota)	105 th day (postR2B Live)	154 th day (post R2B + IB killed)
Bijapur	8	2.94±0.01 ^a	3.23±0.02	3.41±0.02 ^a	3.72±0.02	3.73±0.02
Belagaum	8	3.00±0.01 ^b	3.29±0.02	3.49±0.02 ^b	3.66±0.04	3.73±0.02
Dharawad	8	3.01±0.02 ^b	3.27±0.03	3.40±0.02 ^a	3.64±0.02	3.68±0.02
Pooled mean	24	2.98±0.01	3.26±0.13	3.43±0.13	3.67±0.17	3.71±0.01

Means bearing at least one common superscript within a column not differ significantly (P≤0.05)

Rajakumar (2013) reported in Bangalore division that the values of HI titers (Log₂) at day old (5.11±0.24), at 28th day post F1 vaccination (7.38±0.37), at 49th day post Lasota vaccination (8.11±0.15), at 105th day post R2B vaccination (8.83±0.18) and at 154th day post R2B + IB killed vaccination (7.50±0.18).

Gopinath (2013) reported in Mysore division that the values of HI titers (Log₂) at day old (0.30±0.07), at 28th day post F1 vaccination (5.06±1.76), at 70th day (7.60±1.87) and at 133rd day post R2B + IB killed vaccination (7.04±1.88). Paramatmasingh *et al.*, (2009) reported in Kadakanath (7.49±0.25 log₂) Chatterjee *et al.*, (2007) reported in Kadakanath (9.44±0.16) and Aseel (8.65±0.09 Log₂). Haunshi *et al.*, (2013) recorded in

Aseel and Kadakanath breeds at 32 weeks of age as 9.70±0.27 and 9.87±0.27, respectively.

Based on the results of the present study on characterization and performance evaluation of indigenous chicken of Belagaum division the following conclusions can be drawn.

The performance of indigenous chicken belonging to Bijapur district and Belagaum district were better in terms of body weight and carcass yield. The birds of Belagaum and Dharawad were better in egg production. Percentage of mortality was less in Bijapur with good FCR compared to other two districts.

The immune competence against New Castle disease revealed that the birds of all the three districts had protective ELISA

titers at all ages tested on them.

The Indigenous chicken showed significant variations among the studied districts in their performance, Egg Quality and Carcass traits that indicates the Genetic variations among the Indigenous chickens in the study area that has to be exploited through improved Management and Breeding strategies

The indigenous chicken of all the three districts evaluated needs further investigation for molecular characterization and Genetic similarity / divergence with other Indian breeds and efforts must be taken to conserve these germplasm.

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