

Sexwise Comparison and Evaluation of Carcass Traits in Indigenous Chicken

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ABSTRACT

A study was conducted to evaluate the variations in carcass traits of males, females and on combined sex in indigenous chicken of different districts of Mysore division of Karnataka state. The average live weight recorded was 1136.50±48.26 in Chamarajanagar, 1148.30±81.46 in Mysore and 1262.20±75.92g in Mandya district male birds. The average live weight recorded for female birds was 828.30±70.20 in Mandya, 833.50±53.62 in Mysore and 867.30±77.49g in Chamarajanagar district. When pooled over sexes the corresponding values for live weight was 990.90±59.64 in Mysore, 1001.90±54.10 in Chamarajanagar and 1045.25±70.75g in Mandya district birds respectively and no significant (P=0.05) differences were noticed between birds of different districts in live weight. In males majority of carcass traits showed significant (P=0.05) differences between different districts except in percent feather weight, heart weight, breast weight, back weight and drumstick weight. In females majority of carcass traits showed no significant (P=0.05) differences between different districts except in percent blood weight, heart weight, giblet weight, breast weight, drumstick weight and thigh weight. When combined over sex, significant (P=0.05) differences were noticed in percent dressed, eviscerated, blood, heart, gizzard, giblet, drumstick, thigh and neck weights. The variations recorded in some carcass traits of males, females and on combined sex of indigenous chicken evaluated in this study could be attributed due to the differences in genetic makeup of the birds of different districts.

Keywords : *Indigenous chicken, Carcass traits, Live weight, Dressed weight, Eviscerated weight*

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INTRODUCTION

Currently indigenous chicken in rural and tribal areas constitute about 38% of the country's chicken population. However, due to their low productivity they contribute only 21% to the total egg and meat production but still the eggs and meat are sold at higher premium price compared to commercial egg and meat. Indigenous chicken meat is an important source of animal protein for most of Indian population which provide them nutritional security, as well as economic stability to some extent. Factors like processing yield, proportion of various cut parts and meat yield of indigenous chicken is also important criteria for consumers as well as producers, several reports are available with respect to carcass qualities of commercial birds under intensive system (Singh et al. 1994) but in respect of indigenous chicken under intensive system literature is very scanty, so this study was under taken to evaluate sex wise yield of carcass traits in indigenous chicken belongs to Mysore division of Karnataka which were reared under intensive system.

MATERIALS AND METHODS

At the age of seventeen weeks twenty indigenous birds (ten males and ten females) reared on deep litter system belongs to Chamarajanagar, Mysore and Mandya districts of Mysore division of Karnataka State were used for carcass traits study as per standard procedures. The birds were starved for 12 hours before the actual slaughter. However, drinking water

was provided ad libitum during starvation period and their live body weight was recorded after starvation. The birds were slaughtered by Halal method by cutting the jugular vein, bled for 1.5 to 2 minutes and then scalded at 1370F for 2 minutes and manually defeathered to record defeatherd weight. Dressed by separating the head and shank to record dressed weight, Evisceration was done by making a slit opening at the skin to find and remove esophagus and trachea, and below the breast bone to remove viscera and eviscerated weight was recorded. Feather weight, was recorded by subtracting bled weight from defeatherd weight, Later the legs at hock joint, wings at shoulder joint and neck were separated and weighed, then leg was cut into two parts., drumstick and thigh, breast and back was separated all along length wise to make two halves, to record the weight of all cut parts on a electronic balance. Heart, liver and gizzard were separated and cleaned. Pericardium of heart, gallbladder of liver and internal layer of gizzard lining were removed before weighing them separately to record their weight individually and also weighed them together to record giblet weight. The corresponding percent weight for all carcass traits were computed with respect to their live weight and tabulated. The data obtained was subjected to statistical analysis as per method prescribed by Snedecor and Cochran 1967 by using SPSS Statistics 17 software.

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RESULTS AND DISCUSSION

Live weight (g): The average live weight recorded was 1136.50 ± 48.26 in Chamarajanagar, 1148.30 ± 81.46 in Mysore and 1262.20 ± 75.92 g in Mandya district male birds. The corresponding values for female birds were 828.30 ± 70.20 in Mandya, 833.50 ± 53.62 in Mysore and 867.30 ± 77.49 g in Chamarajanagar. When pooled over sexes the values were 990.90 ± 59.64 for Mysore, 1001.90 ± 54.10 for Chamarajanagar and 1045.25 ± 70.75 g for Mandya district birds respectively. No significant differences were noticed between the birds of different districts in their live weight with respect to males, females as well as for combined sex.

Dressed weight (%): Dressed weight recorded were 80.67 ± 0.92 , 82.26 ± 0.35 and 83.44 ± 0.56 % in males of Chamarajanagar, Mysore and Mandya respectively. Significant ($P=0.05$) difference was noticed between Chamarajanagar and Mandya district birds only the corresponding mean percent dressed weight recorded were 79.27 ± 0.79 , 80.94 ± 0.88 and 81.36 ± 0.98 in females of Chamarajanagar, Mandya and Mysore, respectively.

For combined sex, the percent dressed weight computed were 79.97 ± 0.61 , 81.81 ± 0.52 and 82.19 ± 0.58 in Chamarajanagar, Mysore and Mandya respectively. Significant ($P=0.05$) difference was noticed between Chamarajanagar and other two districts. Present values are higher than the values reported by Vijh et al. (2005) in Miri birds, Tantia et al. (2006) in Ankaleshwar breed and Doley et al. (2009) in indigenous chicken of Northeast. Whereas higher percentage of dressed weight was reported by Sharma and Narayan Khedkar (2005) in Kadaknath breed (89.88%).

Eviscerated weight (%): The average percent eviscerated weight in males was 68.44 ± 0.67 in Chamarajanagar, 70.09 ± 0.74 in Mysore and 74.01 ± 1.00 in Mandya district birds. Significant ($P=0.05$) difference was observed between Mandya and other two districts. The average percent eviscerated weight in females was 69.38 ± 1.51 in Mandya, 69.41 ± 0.99 in Mysore and 69.79 ± 0.72 in Chamarajanagar district birds.

When pooled over sexes the average percent eviscerated weight was 69.12 ± 0.50 in Chamarajanagar, 69.76 ± 0.60 in Mysore and 71.70 ± 1.03 in Mandya birds and significant ($P=0.05$) difference was noticed between Mandya and other two district birds. Present values are comparable with the values reported by Mahapatra et al. (1982) and higher than the values reported by Deepak Sharma (1995).

Edible carcass weight (%): The average percent edible carcass weight was 73.62 ± 0.60 , 74.75 ± 0.57 and 78.29 ± 0.98 for males of Chamarajanagar, Mysore and Mandya districts, respectively and difference noticed between birds of Mandya

and the remaining two districts were significant ($P=0.05$). The mean percent edible carcass weight was 73.76 ± 1.42 , 75.24 ± 0.65 and 75.36 ± 0.96 in females of Mandya, Chamarajanagar and Mysore district respectively and the mean percent edible carcass weight was 74.43 ± 0.47 in Chamarajanagar, 75.06 ± 0.55 in Mysore and 76.03 ± 0.99 in Mandya district birds when pooled over sex.

Blood weight (%): Mean percent blood weight recorded in males of Mysore, Mandya and Chamarajanagar were 2.89 ± 0.08 , 3.54 ± 0.39 and 5.02 ± 0.38 , respectively. While in females the mean blood weight was 3.43 ± 0.30 in Mysore, 4.58 ± 0.64 in Mandya and 6.34 ± 0.57 % in Chamarajanagar district. In combined sex, the mean blood weight was 3.17 ± 0.16 in Mysore, 4.06 ± 0.38 in Mandya and 5.69 ± 0.36 % in Chamarajanagar birds.

Significant ($P=0.05$) differences in percent blood weight of males and females were observed between Chamarajanagar and other two districts and in combined sex between Chamarajanagar and Mysore as well as Mandya and Mysore birds. Present values are comparable with the reports of Mahapatra et al. (1982) in Aseel Kagar and Jaturasith et al. (2002) in Thai native chicken but lower than the values reported by Mahapatra et al. (1982) in Aseel peela (5.78%).

Feather weight (%): The mean percent feather weight in male birds was 6.47 ± 0.66 in Chamarajanagar, 6.65 ± 0.32 in Mysore and 7.27 ± 0.43 in Mandya, while in female birds it was 6.73 ± 0.32 in Chamarajanagar, 6.85 ± 0.60 in Mysore and 7.58 ± 0.52 % in Mandya district. When pooled over sex, the percent feather weight was 6.61 ± 0.36 in Chamarajanagar, 6.76 ± 0.33 in Mysore and 7.43 ± 0.33 in Mandya district birds and present values are higher than the values reported by Mahapatra et al. (1982) in Aseel and Jaturasith et al. (2002) in Thai native chicken.

Liver weight (%): The liver weight expressed as per cent live weight in male chicken was 1.69 ± 0.09 , 1.83 ± 0.07 and 1.99 ± 0.06 in Mysore, Mandya and Chamarajanagar districts respectively. Significant ($P=0.05$) difference was noticed in the liver weight of chicken between Chamarajanagar and Mysore district. The mean percent liver weight in female chicken was 1.69 ± 0.10 in Mandya, 1.94 ± 0.05 in Chamarajanagar and 2.23 ± 0.29 % in Mysore district. When pooled over sex the mean liver weight was 1.76 ± 0.06 in Mandya, 1.97 ± 0.04 in Chamarajanagar and 1.97 ± 0.16 % in Mysore birds and these values are comparable with the values reported by Sharma and Narayan Khedkar (2005) in Kadaknath breed and Chatterjee and Yadav (2008) in Nicobari fowl. The values in the present study are lower than the values reported by Jaturasith et al. (2002) in Thai native chicken, Vijh et al.

(2005) in Miri and Tantia et al. (2006) in Ankaleshwar breed of chicken.

Heart weight (%): The mean percent heart weight for males was 0.33 ± 0.02 , 0.39 ± 0.02 and $0.40 \pm 0.01\%$ in Mandya, Mysore and Chamarajanagar district respectively and it was 0.21 ± 0.03 in female chicken from Mandya, 0.38 ± 0.03 in Mysore and 0.41 ± 0.02 in Chamarajanagar. Heart weight percent was 0.27 ± 0.11 in Mandya, 0.39 ± 0.08 in Mysore and 0.41 ± 0.06 in Chamarajanagar birds for combined sex. Significant ($P=0.05$) differences were observed between Mandya and other two districts for percent heart weight in females as well as for combined sex and present values are comparable with values reported by Sharma and Narayan Khedkar (2005) in Kadaknath chicken and lower compared to the values reported by Jaturasith et al. (2002) in Thai native chicken, Vijh et al. (2005) in Miri, Tantia et al. (2006) in Ankaleshwar and Chatterjee and Yadav (2008) in Nicobari fowl.

Gizzard weight (%): In male birds the average percent gizzard weight was 2.10 ± 0.11 in Mandya, 2.54 ± 0.19 in Mysore and 2.76 ± 0.08 in Chamarajanagar district. Significant ($P=0.05$) difference was noticed between Mandya and other two districts. The average percent gizzard weight was 2.45 ± 0.16 in Mandya, 3.07 ± 0.17 in Chamarajanagar and $3.31 \pm 0.43\%$ in Mysore for female birds.

When combined over sexes, the average percent gizzard weight was 2.28 ± 0.24 in Mandya, 2.92 ± 0.10 in Chamarajanagar and $2.93 \pm 0.24\%$ in Mysore birds. Significant ($P=0.05$) difference was observed between Mandya and other two districts. These values are higher than the values reported by Sharma and Narayan Khedkar (2005) in Kadaknath breed of chicken and Chatterjee and Yadav (2008) in Nicobari fowl (1.58 to 1.75%), but present values are lower compared to the values by Vijh et al. (2005) in Miri and Tantia et al. (2006) in Ankaleshwar birds.

Giblet weight (%): The average percent giblet weight was 4.28 ± 0.14 in Mandya, 4.65 ± 0.21 in Mysore and 5.17 ± 0.12 in Chamarajanagar district for male birds. Significant ($P=0.05$) difference was noticed between Chamarajanagar and other two districts. In females percent giblet weight was 4.37 ± 0.25 in Mandya, 5.44 ± 0.22 in Chamarajanagar and 5.94 ± 0.76 in Mysore district. Significant ($P=0.05$) difference was noticed between Mandya and Mysore district birds.

The average percent giblet weight for combined over sexes was 4.33 ± 0.14 in Mandya, 5.30 ± 0.41 in Mysore and 5.31 ± 0.12 in Chamarajanagar birds. The values are comparable with values reported by Jaturasith et al. (2002) in Thai native chicken but lower than the values reported by Mahapatra et al. (1982) in Aseel, Deepak Sharma, (1995) in Mizoram chicken and Doley et al. (2009) in indigenous chicken of Northeast.

Breast weight (%): The average breast weight of males was 14.60 ± 0.48 in Mandya, 14.86 ± 0.63 in Mysore and $15.37 \pm 0.54\%$ in Chamarajanagar district. In females, the corresponding values were 14.89 ± 0.89 in Mysore, 16.11 ± 0.54 in Chamarajanagar and $17.34 \pm 0.45\%$ in Mandya district. Significant ($P=0.05$) difference was noticed between Mysore and Mandya district birds.

The average percent breast weight was 14.88 ± 0.53 in Mysore birds, 15.75 ± 0.38 in Chamarajanagar and 15.97 ± 0.45 in Mandya district birds when combined over sex. These values are lower than the values reported by Mahapatra et al. (1982) in Aseel Kagar and Aseel Peela, Deepak Sharma (1995) in Mizoram chicken, Vijh et al. (2005) in miri and Tantia et al. (2006) in Ankaleshwar birds (those values ranged between 21.37 to 24.33%), indicating lesser breast muscle in present native chicken evaluated.

Back weight (%): The average percent back weight was 15.39 ± 0.27 in Mysore, 15.48 ± 0.33 in Chamarajnagar and $16.19 \pm 0.74\%$ in Mandya district male birds while in female birds it was 15.60 ± 0.32 in Chamarajanagar, 16.08 ± 0.30 in Mysore and $16.91 \pm 1.29\%$ in Mandya district. When pooled over sexes back weight was 15.55 ± 0.22 in Chamarajanagar, 15.74 ± 0.21 in Mysore and $16.56 \pm 0.73\%$ for Mandya district chicken. Present values are lower than the values reported by Mahapatra et al. (1982) in Aseel kagar and Aseel peela, Sharma (1995) in Mizoram chicken, Vijh et al. (2005) in Miri and Tantia et al. (2006) in Ankaleshwar (20.94 to 24.24%), indicating lesser back weight in present native chicken evaluated.

Drumstick weight (%): The average percent drumstick weight in males was 11.44 ± 0.27 in Mysore, 11.80 ± 0.18 in Mandya and 12.11 ± 0.32 in Chamarajanagar district, in females it was 9.86 ± 0.36 in Mandya, 10.85 ± 0.23 in Mysore and 11.02 ± 0.18 in Chamarajanagar district. Significant ($P=0.05$) differences were noticed between Mandya and other two district birds.

When pooled over sexes, the average percent drumstick weight was 10.84 ± 0.30 in Mandya, 11.15 ± 0.18 in Mysore and 11.57 ± 0.21 in Chamarajanagar birds. Significant ($P=0.05$) difference was noticed between chicken of Chamarajanagar and Mandya district. The values are lower than the values reported by Mahapatra et al. (1982), Sharma (1995), Jaturasith et al. (2002), Vijh et al. (2005) and Tantia et al. (2006).

Thigh weight (%): In male birds average thigh weight was 10.04 ± 0.49 in Chamarajanagar, 11.62 ± 0.56 in Mysore and $12.13 \pm 0.22\%$ in Mandya district. Significant ($P=0.05$) differences were noticed between Chamarajanagar and other two district birds. In females average percent thigh weight was 10.40 ± 0.32 in Chamarajanagar, 10.72 ± 0.20 in Mandya and

11.26±0.16% in Mysore district. Significant (P=0.05) difference was noticed between birds of Chamarajanagar and Mysore district.

When pooled over sexes average percent thigh weight was 10.22±0.29 in Chamarajanagar, 11.43±0.21 in Mandya and 11.44±0.29% for Mysore birds. Significant (P=0.05) differences were noticed between Chamarajanagar and other two districts birds. These values are lower than the values reported by Mahapatra et al. (1982), Sharma (1995), Jaturasith et al. (2002), Vijh et al. (2005) and Tantia et al. (2006).

Wing weight (%): The average percent wing weight was 9.10±0.59 in Mysore, 9.59±0.19 in Chamarajanagar and 12.02±1.31 in Mandya district for male birds. Significant (P=0.05) difference was noticed between Mysore and Mandya district chicken. In female birds percent wing weight was 9.12±0.17 in Mandya, 9.34±0.34 in Mysore and 9.62±0.34 in Chamarajanagar district.

When pooled over sexes the values were 9.23±0.33 in Mysore, 9.61±0.19 in Chamarajanagar and 10.57±0.72 in Mandya district birds. These values are comparable with values reported by Tantia et al. (2006a) in Ankaleshwar but lower than the values of Mahapatra et al. (1982) in Aseel kagar and Aseel peela, Deepak Sharma (1995) in Mizoram chicken, Jaturasith et al. (2002) in Thai native chicken, and Vijh et al. (2005a) in Miri, (those values were between 11.6 to 14.25%).

Neck weight (%): The mean percent neck weight in males was 4.87±0.17 in Chamarajanagar, 5.37±0.17 in Mandya and 5.66±0.16 in Mysore district. Significant (P=0.05) difference was noticed between Chamarajanagar and Mysore birds. The mean percent neck weight was 5.07±0.30 in Mandya, 5.33±0.15 in Chamarajanagar and to 5.57±0.22 in Mysore district female birds.

In combined sex the percent neck weight was 5.11±0.12 in Chamarajanagar, 5.22±0.17 in Mandya and 5.62±0.13 for Mysore district birds. Significant (P=0.05) difference was noticed between Chamarajanagar and Mysore birds. Present values are lower compared to values reported by Mahapatra et al. (1982), Sharma (1995), Vijh et al. (2005), and Tantia et al. (2006).

CONCLUSION

The carcass yield obtained for different carcass traits in the present study were lower than most of the values reported earlier for different indigenous chicken breeds except for Aseel chicken breed. The variations recorded in carcass traits of present study for males, females and on combined sex of indigenous chicken of three districts may be attributed to the

differences in genetic makeup of the birds, as these birds evaluated were reared on deep litter but were produced from hatching eggs collected from different locations of three districts of Mysore division of Karnataka state.

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Table 1: Carcass traits (%) of indigenous male chicken

Districts	Live weight	Dressed carcass	Eviscerated carcass t	Edible carcass	Blood	Feather	Giblet	Breast	Back	Drumstick	Thigh	Wing t	Neck
Chamarajanagar	1136.50 ± 48.26	80.67a ± 0.92	68.44a ± 0.67	73.82a ± 0.60	5.02b ± 0.38	6.47 ± 0.66	5.17b ± 0.12	15.37 ± 0.54	15.48 ± 0.33	12.11 ± 0.32	10.04a ± 0.49	9.59ab ± 0.19	4.87a ± 0.17
Mysore	1148.30 ± 81.46	82.26ab ± 0.35	70.09a ± 0.74	74.75a ± 0.57	2.89a ± 0.08	6.65 ± 0.32	4.65a ± 0.21	14.86 ± 0.63	15.39 ± 0.27	11.44 ± 0.27	11.62b ± 0.56	9.10a ± 0.59	5.66b ± 0.16
Mandya	1262.20 ± 75.92	83.44b ± 0.56	74.01b ± 1.00	78.29b ± 0.98	3.54a ± 0.39	7.27 ± 0.43	4.28a ± 0.14	14.60 ± 0.48	16.19 ± 0.74	11.80 ± 0.18	12.13b ± 0.22	12.02b ± 1.31	5.37ab ± 0.17

Values having at least one common superscript in a column do not differ significantly (P = 0.05)

Table 2: Carcass traits (%) of indigenous female chicken

Districts	Live weight	Dressed carcass	Eviscerated carcass t	Edible carcass	Blood	Feather	Giblet	Breast	Back	Drumstick	Thigh	Wing t	Neck
Chamarajanagar	867.30 ± 77.49	79.27 ± 0.79	69.79 ± 0.72	75.24 ± 0.65	6.34b ± 0.57	6.73 ± 0.32	5.44ab ± 0.22	16.11ab ± 0.54	15.60 ± 0.32	11.02b ± 0.18	10.40a ± 0.32	9.62 ± 0.34	5.33 ± 0.15
Mysore	833.50 ± 53.62	81.36 ± 0.98	69.41 ± 0.99	75.36 ± 0.96	3.43a ± 0.30	6.85 ± 0.60	5.94b ± 0.76	14.89a ± 0.89	16.08 ± 0.30	10.85b ± 0.23	11.26b ± 0.16	9.34 ± 0.34	5.57 ± 0.22
Mandya	828.30 ± 70.20	80.94 ± 0.88	69.38 ± 1.51	73.76 ± 1.42	4.58a ± 0.64	7.58 ± 0.52	4.37a ± 0.25	17.34b ± 0.45	16.91 ± 1.29	9.86a ± 0.36	10.72ab ± 0.20	9.12 ± 0.17	5.07 ± 0.30

Values having at least one common superscript in a column do not differ significantly (P = 0.05)

Table 3: Percent weight of carcass traits in indigenous chicken in combined sex

Districts	Live weight	Dressed carcass	Eviscerated carcass t	Edible carcass	Blood	Feather	Giblet	Breast	Back	Drumstick	Thigh	Wing t	Neck
Chamarajanagar	1001.90 ± 54.10	79.97a ± 0.61	69.12a ± 0.50	74.4 ± 0.47	5.69b ± 0.36	6.61 ± 0.36	5.31b ± 0.12	15.75 ± 0.38	15.55 ± 0.22	11.57b ± 0.21	10.22a ± 0.29	9.61 ± 0.19	5.11a ± 0.12
Mysore	990.90 ± 59.64	81.81b ± 0.52	69.76ab ± 0.60	75.06 ± 0.55	3.17a ± 0.16	6.76 ± 0.33	5.30b ± 0.41	14.88 ± 0.53	15.74 ± 0.21	11.15ab ± 0.18	11.44b ± 0.29	9.23 ± 0.33	5.62b ± 0.13
Mandya	1045.25 ± 70.77	82.19b ± 0.58	71.70b ± 1.03	76.03 ± 0.99	4.06b ± 0.38	7.43 ± 0.33	4.33a ± 0.14	15.97 ± 0.45	16.56 ± 0.73	10.84a ± 0.30	11.43b ± 0.21	10.57 ± 0.72	5.22ab ± 0.17

Values having at least one common superscript in a column do not differ significantly (P = 0.05)