



CARCASS CHARACTERISTICS OF KADAKNATH FOWL REARED UNDER INTENSIVE SYSTEM IN CHHATTISGARH

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ABSTRACT

Sixteen adult kadaknath birds (both male and female) at 20 weeks of age raised under deep litter system in the poultry unit of College of Veterinary Science and Animal Husbandry, Anjora, Durg, Chhattisgarh were evaluated for carcass traits and chemical composition of meat. The body weights of males and females were 1249.33 ± 42.73 and 936.33 ± 10.17 g, respectively. Males were significantly ($P < 0.05$) heavier than females. Non significant differences ($P > 0.05$) were recorded between sex for percentage weight of bled, dressed, eviscerated, giblet, back + neck and gizzard. However, leg % and wing % were significantly higher ($P < 0.05$) in males than females, while liver %, heart % and abdominal fat % were significantly higher ($P < 0.05$) in females than males. The dressing percentage in the two sexes was found to be 67.57 ± 1.41 and 67.38 ± 0.46 , respectively. The percentage loss in body weight due to blood, feather, evisceration and aggregate loss were 3.57 ± 0.33 , 18.04 ± 0.66 , 10.91 ± 0.57 and 32.52 ± 0.80 , respectively and showed no significant ($P > 0.05$) difference between the two sexes. The percentage mean values of moisture, dry matter, crude protein did not differ significantly ($P > 0.01$) whereas total ash % and ether extract % were 3.74 ± 0.28 and 5.55 ± 0.28 , respectively which showed significant difference ($P < 0.01$) in breast and leg muscle of males and females.

KEYWORDS: Kadaknath, Carcass trait, fowl, Chhattisgarh.

INTRODUCTION

The poultry industry during the past two decades has been one of the most dynamic and ever expanding sectors in the world. Native chicken breeds are gaining importance over the years due to their unique attributes. The Kadaknath breed, also known as Kalamashi is known for its black-colored meat (Thakur *et al.*, 2006). It is being reared by tribal communities in its breeding tract of Jhabua and Dhar districts in the western region of the state of Madhya Pradesh and in adjoining areas of the states of Gujarat and Rajasthan. Although the meat of this breed has an unattractive appearance and is black in colour, it has a delicious flavour (Panda and Mahapatra, 1989). The meat of the Kadaknath breed contains high percentage (25.47%) of protein and is believed to have aphrodisiac properties (Mohan *et al.*, 2008). Despite of unique characteristics, Kadaknath breed has been neglected because of its poor production potential. However, this germplasm is known for its hardiness and adaptability to the tropical conditions of India and is being used for development of germplasm suitable for backyard poultry farming (Rout *et al.*, 1992). Though, earlier report (Pathak *et al.*, 2015) have compared some carcass traits of Aseel and Kadaknath breed but detailed carcass characteristics and chemical composition of muscle of Kadaknath are still to be studied. Therefore, present study was aimed to evaluate the carcass traits and chemical composition of muscles of Kadaknath breed.

MATERIALS & METHODS

Sixteen adult birds at 20 weeks of age (both male and female) raised under deep litter system in the poultry unit of College of Veterinary Science and Animal Husbandry, Anjora, Durg, Chhattisgarh were used for the study of carcass characteristics. The birds were provided *ad libitum* starter chick ration (2800 Kcal ME per kg of feed and 18% C.P.) upto 8 weeks of age and grower ration (2700 Kcal ME per kg of feed and 16% C.P.) from 9 to 20 weeks of age. The ingredients used for the ration formulation included maize, soybean meal, soya cake, deoiled rice bran, salt and vitamin, lysine, DL methionine, trace minerals, shell grit and dicalcium phosphate. The birds were starved for 12 hours before the actual slaughter. However, drinking water was provided *ad-libitum* during starvation period and their 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 55°C for 2 minutes.

Carcass characteristics

The carcass parts (%) *viz.* legs, breast and various organ weights (%) *viz.* heart, liver and gizzard were recorded.

Chemical composition of meat

Dry matter, crude protein, ether extract and total ash of breast and thigh muscle samples were determined as per AOAC (2000) methods. Dry matter was estimated by drying the meat samples for 12 hours at 60-80°C in hot air oven. Protein and fat percentage were expressed on dry matter basis.

Statistical analysis

Standard statistical procedure was used to calculate mean and standard errors of various carcass characteristics of birds at 20 weeks of age and chemical composition of muscle. Independent mean t test was applied to test the difference in mean values of the two sexes.

RESULTS & DISCUSSION

Males were significantly heavier than females at 20 weeks of age (Table 1). Haunshi *et al.* (2011) and Pathak *et al.* (2017), also reported significantly ($p < 0.001$) higher live weight in males of Kadaknath and Aseel breed. Similar findings were observed by Singh and Pathak (2016) in Cobb-400, Vanraja, Aseel and Kadaknath at 5 week of age. Non significant difference was observed between male and females with respect to different cuts and body

parts except leg, wing, abdominal fat, liver and heart (Table 1). Present study is in congruence with the findings of Kgwatalala *et al.* (2013) who reported significant ($p < 0.05$) difference in live weight, heart weight, wing weight and thigh weight in male and female of Necked neck, Normal and Dwarf strain of Tswana at 20 weeks of age. Likewise, Premvalli *et al.* (2016) reported significant ($p < 0.05$) difference in live weight, back, thigh and wing. Pathak *et al.* (2015) also reported that live weight, dressed weight, eviscerated weight, heart, breast, thighs except liver, gizzard and intestines were significantly ($P < 0.05$) higher in Aseel than Kadaknath. Blood loss, feather loss, eviscerated loss and total loss in live body weight showed no significant ($P > 0.05$) difference in both male and female.

TABLE 1. Carcass characteristics of Kadaknath breed of chickens at 20 weeks of age

Carcass Traits	Male	female	Overall
Live wt.gm	1249.33 ± 42.73 ^a	936.33 ± 10.17 ^b	1092.83 ± 72.69
Bled wt %	96.31 ± 0.22	96.56 ± 0.69	96.43 ± 0.33
Dressed wt %	67.57 ± 1.41	67.38 ± 0.46	67.47 ± 0.67
Eviscerated wt %	66.21 ± 1.44	65.31 ± 0.70	65.76 ± 0.75
Giblet wt	3.78 ± 0.05	4.36 ± 0.25	4.07 ± 0.17
Leg wt %	21.24 ± 0.4 ^a	17.34 ± 1.94 ^b	19.29 ± 1.02
Breast %	17.02 ± 0.19	16.73 ± 1.34	16.88 ± 0.61
Back + Neck wt. %	13.14 ± 0.07	12.14 ± 0.57	12.64 ± 0.34
Wing %	6.33 ± 0.14 ^a	5.55 ± 0.22 ^b	5.94 ± 0.21
Gizzard%	1.98 ± 0.00	2.27 ± 0.20	2.12 ± 0.11
Liver %	1.14 ± 0.06 ^a	1.63 ± 0.04 ^b	1.52 ± 0.06
Heart%	0.39 ± 0.01 ^a	0.46 ± 0.00 ^b	0.43 ± 0.02
Abdominal fat%	0.29 ± 0.03 ^a	0.41 ± 0.02 ^b	0.35 ± 0.03
Blood loss%	3.69 ± 0.22	3.44 ± 0.69	3.57 ± 0.33
Feather loss %	17.11 ± 1.06	18.97 ± 0.39	18.04 ± 0.66
Eviscerated loss %	11.63 ± 1.01	10.20 ± 0.24	10.91 ± 0.57
Total loss %	32.43 ± 1.67	32.62 ± 0.53	32.52 ± 0.80

Note: Means with different superscripts in a row differ significantly ($P < 0.05$)

TABLE 2. Chemical composition of breast and thigh meat of Kadaknath male and female at 20 week of age

Parameters	Kadaknath Male		Kadaknath Female		Overall	
	Breast meat	Leg meat	Breast meat	Leg meat	Breast meat	Leg meat
Moisture%	75.38 ± 0.38	73.87 ± 0.59	75.50 ± 1.00	75.79 ± 0.99	74.86 ± 0.53	75.58 ± 0.48
Dry matter%	25.78 ± 0.17	24.63 ± 0.38	27.46 ± 0.40	24.21 ± 0.99	26.62 ± 0.42	24.21 ± 0.62
Crude protein% (on dry matter basis)	87.50 ± 2.02	84.58 ± 1.54	84.58 ± 0.58	82.25 ± 2.02	86.04 ± 1.14	83.42 ± 1.25
Ether extract % (on dry matter basis)	3.50 ± 0.10	3.16 ^b ± 0.12	3.65 ± 0.14	4.33 ^a ± 0.19	3.58 ± 0.08	3.74 ± 0.28
Total ash% (on dry matter basis)	4.99 ± 0.10	4.95 ^b ± 0.06	5.20 ± 0.37	6.15 ^a ± 0.15	5.09 ± 0.18	5.55 ± 0.28

Note: Means with different superscripts in a row differ significantly ($P < 0.01$)

Contradictory to present findings, higher blood loss was reported by Gupta *et al.* (2006), Atkare *et al.* (2003) and Nischal *et al.* (2002). All carcass traits of present study were comparable with the report of Haunshi *et al.* (2013). In a study, Pathak *et al.* (2017) found that all the carcass traits were higher in Aseel as compared to Kadaknath and reported significant ($p < 0.05$) difference in live weight, eviscerated weight, Heart, breast, thigh and legs, however; non significant ($p > 0.05$) difference was recorded in dressed weight, liver and gizzard. Dressing percentage did not differ significantly in male and female which is in agreement with the findings of Thutwa *et al.* (2012),

Fernandez *et al.* (2013) and Sanka and Mbagha (2014). Proximate analysis of breast and leg muscle of male and female Kadaknath birds at 20 weeks of age are presented in Table 2. Percentage of dry matter and moisture content was similar to those reported by De marchi *et al.* (2005) in Padovana breed of chicken in Italy and Ali *et al.* (2007), respectively. In contrast, lower protein and ash content were reported by De marchi *et al.* (2005) and Ali *et al.* (2007). Non-significant difference were recorded among male and female with reference to crude protein content of meat in Kadaknath chickens, which showed resemblance with report of Siddiqi *et al.* (1994), who also reported non-

significant difference between protein content of White leghorn and other poultry breeds.

The results further revealed significant ($p < 0.05$) difference of ether extract content among two sex of Kadaknath breed. Present report could be compared with reports in other breed of chicken. Valavan *et al.* (2016) reported significant ($p < 0.05$) difference in crude fat and ash of breast and thigh muscle from native chicken and broilers. In a study, Rehman *et al.* (2016) recorded significant ($P < 0.05$) difference in ether extract content between Fayoumi and White leghorn breeds. During present study, the dry matter and moisture showed non-significant difference among male and female of Kadaknath birds. Likewise, Haunshi *et al.* (2013) reported similar values of dry matter and protein percentage whereas higher fat in breast muscle and leg muscle.

Contradictory to present study, Ilavarasan *et al.* (2016) reported lower moisture, protein, fat and ash in desi chicken of Tamilnadu, whereas higher fat was observed by Pambuwa and Tanganyika (2017).

CONCLUSION

It can be concluded from present study that sex wise non significant difference ($p > 0.05$) were recorded in most of the carcass traits of Kadaknath chicken except live weight, leg weight, wing weight, heart weight and liver weight. Protein, moisture and dry matter percentage was higher in breast muscle as compared to thigh muscle in both the sexes.

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Carcass Characteristics of Kadaknath Fowl

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