INFLUENCE OF SEX ON THE CARCASS CHARACTERISTICS OF SPENT TURKEY BIRDS

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ABSTRACT

A study was undertaken to assess the influence of sex on the carcass characteristics of spent turkey birds. A total of seventy two spent turkey birds (36 from each sex) belonging to different breeds were obtained from various sources and slaughtered under hygienic conditions in the department of Livestock Products Technology (RIVER). Results revealed that the male birds had uniformly recorded higher value for live, dressed, edible and inedible offals than female birds and differed ($p < 0.05$) significantly. Cut up parts of male birds showed higher proportion with breast and neck, but in contrast back, thigh, drumstick and wings are found to be higher with female birds. Individual components of cut up parts, meat percentage was found to be higher with male birds, while female had higher bone percentage.

KEYWORDS: Carcass Characteristics, Cut-up Parts & Spent Turkey Birds

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INTRODUCTION

Turkey is one of the important poultry species reared next to chicken for meat purpose. The overall consumption of turkey meat in the world is about 4.7 million metric tons annually and the United States is responsible for almost 50% of all consumption (USDA, 2006). Turkey meat is considered to be lean because of its low fat (8.02%) and high protein content (20.42%) in it (Castro Ferreira *et al.*, 2000). Moreover, Turkey meat is highly nutritious, tastier and tastier too than other poultry meat (O'Brien, 2009). These features provide beneficial effects on human health, especially in the prevention of cardiovascular disease (Otles and Cagindi, 2008). Turkey meat contains selenium which is an antioxidant as well as anti-cancer agent and another cancer-protective nutrient, the B vitamin, niacin and also a good source of vitamin-C (USDA, 2010). In order to raise the production and consumption of turkey meat in India, it is necessary to create awareness among the public about the nutritional composition/component of turkey meat. Nester *et al.*, (2001) reported that the strain, sex and feeding strategies may influence carcass quality and composition of the turkey meat; similar idea was reported by Brenoe *et al.*, (2000) in chicken meat.

Brenoe and Kolstad (2000) studied the development of muscles and bones by using 4-12 week old two commercial strains of turkeys (BUT-9 and Nicholas) of both sexes. They concluded that males should be preferred, since males gained significantly higher body weight and had higher meat percentage from 8 weeks of age. Males of late ages should be used for production of turkeys of high slaughter weights with large pieces of meat to satisfy a particular segment of market, while females should be slaughtered at young age because females had a higher meat

percentage compared to males.

In India, consumption of turkey meat is on rise. But works on carcass characteristics of turkey meat at different age group of either sex are scanty. Keeping these things in view, the present study was undertaken to evaluate the influence of sex on the carcass characteristics of spent turkey birds.

MATERIALS AND METHODS

Collection of Raw Material

Spent turkeys of either sex (36 male and 36 female) belonging to Beltsville small white turkey breeds were obtained from three different places viz., instructional poultry farm of Rajiv Gandhi Institute of Veterinary Education and Research (RIVER) Kurumbapet, Puducherry; Nandhanam poultry farm, Chennai and Global poultry farm, Marakkanam (Tamilnadu).

Processing and Storage of Dressed Carcasses

Birds were slaughtered under hygienic conditions by adopting standard procedures after ante-mortem inspection. At first, the birds were starved of feed for overnight and weighed individually to obtain starved live body weight. The birds were slaughtered by Halal method and bleeding was performed in a bleeding cone by severing the jugular vein and carotid artery with a sticking knife. A total of 3-4min were allowed to ensure complete bleeding and weighed to obtain bled weight. Thereafter birds were scalded at 58-60°C for 2 min followed by de-feathering in an automatic de-featherer and weighed to obtain picked weight. Evisceration was done manually by making a slit between the end of keel bone and rectum and the carcass was washed with potable water followed by chilling in walking cooler (4°C) for 3-4 h and weighed to obtain eviscerated weight. Giblets were collected from each bird and weighed after proper cleaning (heart without pericardium, gizzard without kiolin and liver without gall bladder). All the carcasses were chilled (4±1°C) overnight in a walk in cooler (Bluestar, India) and then deboned manually. All the carcasses were subjected to post-mortem inspection and only healthy carcasses were selected for further use.

Then the carcass was separated into different cut up parts viz., thigh, drumstick, breast, back, wings, neck and each cut up part was subjected to manual deboning at the meat processing unit (temperature maintained at 10°C). The Product temperature was maintained below 7°C throughout the process. Individual components (meat, bone and skin) weights were taken for all birds by using electronic digital balance (Essae-Teraoka) and expressed in grams with percentage yields.

Statistical Analysis

The data generated through six trials were subjected to statistical analysis by using statistical package SPSS 14.0 version (SPCC Inc., Chicago, USA 2005) to analyze the influence of sex on carcass characteristics.

RESULTS AND DISCUSSIONS

The Mean±S.E. of live, dressed, edible and inedible offal's weight of spent turkey birds of both the sex with their percentage are presented in table 1. The mean live and dressed weight of spent turkey birds was found to be 7301.38g and 5595.54g for male whereas 3804.42g and 2462.92g for female, respectively. Male birds had recorded significantly ($P<0.01$) higher live and dressed weight than the female birds. The Mean±S.E. of edible offal's viz., heart, liver, gizzard of spent turkey birds were 33.23, 85.62, and 84.88 for male whereas 16.54, 68.5 and 51.04 for female; differed significantly.

The Mean $\pm$ S.E. in-edible offal's viz., head, shank, blood and feather of spent turkey birds were 217.54, 195.54, 301.54 and 551.08; for male whereas 83.46, 89.13, 128.5 and 228.54 for female; differed significantly. Similar findings were observed in edible (heart, liver and gizzard) and inedible (head, shank, blood, feather) offal's of spent turkey birds. This trend is in agreement with the results obtained by Taha and Farran (2009) in turkeys and Mandal *et al.* (2004) in spent chicken and Ojedapo *et al.* (2008) in broilers who found that the male birds with higher body weights produced all the by-products and dressed weight as well as carcass components in higher amounts (weight basis) compared to female birds with lower body weight.

The Mean $\pm$ S.E. proportion of cut up parts of spent turkey bird's viz., breast, back, thigh, drumstick, wings and neck for both the sex are presented in Table 2. Female birds produced significantly ($P<0.05$) higher proportion of cut up parts with respect to back, thigh and wings when compared to male birds. Similar findings were recorded by Taha and Farran (2009) who made a comparative study in some carcass traits of some local and imported turkey strains (BUT-9) finally he concluded that male had higher proportion of neck while female had higher proportion of back. While studying the growth performance and carcass components of different strains of tom turkeys and other commercial strains, Roberson *et al.* (2004) reported that percent yield of breast, wing, thigh and drumstick were 30.39, 11.67, 18.46 and 13.57, respectively in all the breeds of turkeys slaughtered at 17 weeks of age. Sogut *et al.* (2010) reported live weight of broiler white turkey tom at 16 week of age to be 12478.78g They further reported that the carcass weight, breast, wings and legs (thighs and drumstick) weight were 9721.80g, 3305.19g, 1101.66g and 2261.26g, respectively.

The Mean $\pm$ S.E. of meat (M), bone (B), meat bone ratio (M/B), skin (S) of different cut-up parts are presented in table 3. Male birds had uniformly recorded higher proportion of meat while female birds had recorded higher proportion of bone weight in all the cut up parts except breast and neck. These results are almost similar to the observations reported by Shahin and Elazeem (2005) in broiler chickens who found that the percent yield of bones were uniformly higher ($P<0.05$) in females in all cutup parts except breast and neck.

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CONCLUSIONS

The Mean $\pm$ S.E. of meat (M), bone (B), meat bone ratio (M/B), skin (S) of different cut-up parts are presented in table 3. Male birds had uniformly recorded higher proportion of meat while female birds had recorded higher proportion of bone weight in all the cut up parts except breast and neck. These results are almost similar to the observations reported by Shahin and Elazeem (2005) in broiler chickens who found that the percent yield of bones were uniformly higher ($P<0.05$) in females in all cutup parts except breast and neck

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APPENDICES

Table 1: Effect of Sex on the Quantitative Carcass Characteristics of Spent Turkey Birds

Parameter(g)	Mean±S.E.			Percent Proportion (%)	
	Male	Female	T Value	Male	Female
Live wt	7301.38±523.7 ^a	3804.42±122.6 ^b	6.26**	78.23	63.23
Dressed wt	5595.54±432.9 ^a	2462.92±68.25 ^b	6.87**	76.28	64.90
Edible Offal's					
Heart	33.23±2.29 ^a	16.54±0.86 ^b	6.61**	0.46	0.44
Liver	85.62±4.95 ^a	68.5±5.45 ^b	2.33*	1.21	1.80
Gizzard	84.88±5.08 ^a	51.04±2.01 ^b	6.01**	1.18	1.36
Inedible Offal's					
Head	271.54±14.93 ^a	83.46±3.24 ^b	11.85**	3.88	2.22
shank	195.54±15.61 ^a	89.13±3.07 ^b	6.43**	2.67	2.35
Blood	301.54±35.17 ^a	128.5±6.63 ^b	4.65**	4.04	3.38
Feather	551.08±48.43 ^a	228.54±11.58 ^b	6.26**	7.65	6.03

^{ab}Means bearing different superscript in the same row differed significantly, * Significant (P< 0.05), ** Significant (P<0.01)

Table 2: Effect of Sex on the Proportion of Cut-up Parts in Spent Turkey Birds

Cut-up Parts in (g)	Mean±S.E.			Percent Proportion (%)	
	Male	Female	T Value	Male	Female
Breast	1912.54±196.6 ^a	622.08±21.60 ^b	6.26**	33.44	25.28
Back	997.62±86.29 ^a	642.5±27.08 ^b	3.79**	17.82	26.01
Thigh	757.46±48.27 ^a	384.75±14.00 ^b	7.15**	13.78	15.64
Drumstick	672.38±52.61 ^a	309.75±9.24 ^b	6.53**	12.04	12.58
Wings	615.38±36.36 ^a	312.12±9.54 ^b	7.78**	11.31	12.71
Table 2: Contd.,					
Neck	642.23±52.01 ^a	185.33±12.05 ^b	8.24**	11.67	7.49

^{ab}Means bearing different superscript in the same row differed significantly,* Significant (P< 0.05), ** Significant (P<0.01)

Table 3: Effect of Sex on the Characteristics of Individual Cut -Up Parts of Spent Turkey Birds

Cutup Parts	Individual Component	Mean±S.E. (g)			Percent Proportion (%)	
		Male	Female	T-Value	Male	Female
Breast	Meat	1227.85±121.9 ^a	408±12.56 ^b	6.42**	21.60	16.67
	Bone	207.38±31.06 ^a	113.08±10.8 ^b	2.77*	3.57	4.54
	M/B (%)	6.80±0.63 ^a	4.04±0.44 ^b	3.52**	--	--
	Skin	365.92±53.91 ^a	73.08±5.77 ^b	5.18**	6.35	2.96
Back	Meat	354.92±24.77 ^a	147.5±11.88 ^b	7.35**	6.57	6.07
	Bone	498.85±63.12 ^a	274.42±25.75 ^b	3.19**	8.58	11.18
	M/B (%)	0.84±0.10 ^a	0.72±0.20 ^b	0.51	--	--
	Skin	98.08±10.73 ^b	113.58±14.49 ^a	0.87	1.78	4.52
Thigh	Meat	585.23±41.63 ^a	254±11.55 ^b	7.39**	10.62	10.36
	Bone	108.92±12.78 ^a	62.42±6.59 ^b	3.15**	1.92	2.51
	M/B (%)	5.82±0.45 ^a	4.77±0.63 ^b	1.38	--	--
	Skin	55.31±3.89 ^a	51.83±4.41 ^b	0.59	1.03	2.09
Drumstick	Meat	388.92±32.75 ^a	175.5±3.20 ^b	6.22**	6.97	7.17
	Bone	192.15±20.96 ^a	95.08±3.75 ^b	4.38**	3.37	3.86
	M/B (%)	2.15±0.16 ^a	1.88±0.08 ^b	1.48	--	--
	Skin	64.92±7.35 ^a	27.67±2.74 ^b	4.60**	1.19	1.10
Wings	Meat	262.77±16.2 ^a	105.25±6.35 ^b	8.79**	4.96	4.33
	Bone	223.23±22.78 ^a	154.08±11.03 ^b	2.66*	3.96	6.25
	M/B (%)	1.29±0.13 ^a	0.74±0.09 ^b	3.42**	--	--
	Skin	126.15±14.5 ^a	50.92±4.60 ^b	4.77**	2.27	2.06
Neck	Meat	126.54±11.4 ^a	28.25±2.47 ^b	8.12**	2.43	1.17
	Bone	141.85±21.82 ^a	64.33±3.12 ^b	3.38**	2.49	2.62
	M/B (%)	1.09±0.13 ^a	0.45±0.05 ^b	4.41**	-	--
	Skin	358.85±49.92 ^a	82±8.39 ^b	5.26**	6.45	3.33

^{ab}Means bearing different superscript in the same row differed significantly,* Significant (P< 0.05), ** Significant (P<0.01).