

Effect of Sex on Slaughter and Carcass Traits of Beltsville Small White Turkey (*Meleagris gallopavo*) under Indian Hot Humid Climatic Condition

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Abstract

The study was conducted to know the effect sex on slaughter and carcass quality traits of Beltsville Small White turkey (*Meleagris gallopavo*). Beltsville Small White male and female Turkeys were reared under intensive system was used for this study. 40 Turkeys (20 Male and 20 female) were slaughtered by following standard procedures and slaughter and carcass characteristics were recorded. The mean live weight (kg) , carcass weight(kg), dressing percentage (%) , blood (%),intestines (%), giblets (%),abdominal fat (%),neck (%),wings (%), back (%) and breast (%) values were significantly ($P>0.01$) higher in male turkeys. However, significantly ($P>0.01$) reverse trends were observed in thighs (%) and drumstick yield which was higher in female turkeys. Feathers (%), feet (%) and head (%) yield values between male and female turkeys did not differ significantly. From these results, it is concluded that, sex had a very significant effect on slaughter and carcass characteristics of Beltsville Small White turkeys. Male turkey is more suitable for to obtain better slaughter and carcass traits and higher meat production under Indian hot humid climatic condition.

Key words: Turkey, Beltsville Small White, Slaughter, Carcass, Traits, Cut up parts

Introduction

Commercial turkey farming is becoming popular in India and farmers started to show interest in rearing turkey birds (Anna Anandh *et al.*, 2012). Turkey meat has tremendous commercial viability because of its low fat and cholesterol content in comparison to red meat and other poultry meat. Body weight is probably the most important economic factor in the growth of poultry. Another factor of economic importance to the poultry industry is carcass characteristics, specifically carcass dressed yield and fat content. Meat productivity of turkeys is evaluated not only by the live weight, growth performance, feed conversion, but mainly on the basis of its slaughter traits like slaughter yield, weight of edible parts (Oblakova, 2004). It is very important to know the factors influencing the yield and quality of the carcass. The carcass traits depend on a number of factors, off the biological ones, the greatest impact is produced by genotype, sex and age (Bokkers and Koene, 2003). Breed, sex, and slaughtering age influence carcass

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characteristics of turkeys (Brake *et al.*, 1994; Laudadio *et al.*, 2009). With respect to that, the proportions of major basic carcass parts (breast, drumstick and thigh) as well as the presence of certain tissues in them are regarded as vital parameters determining meat quality (Lewis *et al.*, 1997). Roberson *et al.*, (2004) reported that sex and slaughter age influenced carcass characteristics of turkeys. However, effect of sex on slaughter and carcass characteristics have received limited consideration as compared to age. Information on the effect of sex on slaughter and carcass components of turkeys is also not available in Indian hot humid climatic condition. Hence, the present study was conducted to know the effects of sex on the slaughter and carcass characteristics of Beltsville Small White turkey (*Meleagris gallopavo*).

Material and methods

Experimental design and management

The study was conducted at Turkey Research Unit of Tamil Nadu Veterinary and Animal Sciences University - Regional Research Centre, Pudukkottai, Tamil Nadu. Beltsville Small White eggs were hatched and hatched turkey poults were brooded in a turkey brooder house and fed on a starter concentrate diet for four weeks. They were then transferred to a deep litter turkey grower house and fed on a grower concentrate diet up to the end of week 8. The poults and growers had free access to diet and clean water. At the start of week 9 and for the purpose of this study, 50 turkey growers (25 males and 25 females) were randomly selected of

matching initial body weight and the birds maintained under standard management practices (Anna Anandh *et al.*, 2012). The turkeys were housed in separate experimental houses whose floors were raised and covered with sawdust litter. At the end of the week 16 of age, 40 birds (20 males and 20 females) were selected slaughter studies by following standard procedures. They were individually weighed after overnight fasting (except for water) and then slaughtered. The turkeys were killed by cutting the jugular vein and carotid artery on one side of the neck near atlanto occipital joint. After bleeding the carcasses were scalded at 58 ± 2 °C for 2 min, handpicked and manually eviscerated. The weight of blood, feathers, head, shank and feet and giblets (liver, heart and gizzard) and eviscerated whole carcass were recorded. The eviscerated carcasses were portioned into commercial cuts viz. breast, thighs, drumsticks, back with ribs, wings, and neck and the cuts are weighed. Dressing percentage was expressed as a percentage of the slaughter body weight and the carcass cuts were expressed as a percentage of the eviscerated carcass weight.

Statistical analysis

The data generated from each experimental group were analyzed statistically by following standard procedures (Snedecor and Cochran, 1989) for comparing the means and to determine the effect of sex on slaughter and carcass characteristics of turkeys.

Results and Discussion

Slaughter characteristics

Effect of sex on slaughter characteristics of Beltsville Small White turkey are presented in Table 1. The mean \pm SE slaughter and carcass weight in the male and female were found to be 5.75 ± 0.04 and 4.20 ± 0.04 and 4.68 ± 0.05 and 3.28 ± 0.06 , respectively. The results also showed that male turkeys had heavier slaughter and carcass weights than female. The mean slaughter and carcass weight between male and female turkeys differ significantly ($P>0.01$) between them. The result is in accordance with Chodova *et al.*, (2014) who reported that male turkeys had higher live weight than female turkey. The superiority of males over females for carcass and component weights at a particular age agrees with the results of Khosravania *et al.*, (2006).

Overall mean for Beltsville Small White turkey slaughter and carcass weight were 4.97 ± 0.04 and 3.98 ± 0.06 , respectively. At 16 weeks of age, slaughter weights between 4.85 kg to 7.50 kg were also reported in turkeys (Isguzar, 2003). The mean \pm SE dressing percentage in male and female Beltsville Small White turkey were found to be 81.40 ± 0.02 and 78.10 ± 0.04 , and respectively. Sex had significant ($P < 0.001$) effect on carcass weight with higher values in males. Brake (1995) also found that significant effect of sex on dressing out percentage. The highest dressing percentage was found in male turkey. Overall mean for turkey dressing percentage was 79.75 ± 0.02 . The present dressing of percentage is in conformity of Roberson *at al.*, (2014) who reported 76.6% at 16 week age.

Table 1: Effect of sex on slaughter characteristics of Beltsville Small White turkey (*Meleagris gallopavo*) (Mean \pm SE)

Slaughter Characteristics	Male	Female	Overall - mean \pm SE
Slaughter weight (gm)	5.75 ± 0.04^a	4.20 ± 0.04^a	4.97 ± 0.04
Carcass weight (gm)	4.68 ± 0.05^a	3.28 ± 0.06^b	3.98 ± 0.06
Dressing percentage (%)	81.40 ± 0.02^a	78.10 ± 0.02^b	79.75 ± 0.02
Blood (%)	2.40 ± 0.04^a	2.12 ± 0.04^b	2.26 ± 0.04
Feathers (%)	6.58 ± 0.02	6.50 ± 0.05	6.54 ± 0.04
Intestines (%)	4.52 ± 0.05^a	4.28 ± 0.03^b	4.40 ± 0.04
Giblets (%)	3.78 ± 0.05^a	3.69 ± 0.02^b	3.74 ± 0.03
Feet (%)	3.73 ± 0.05	3.71 ± 0.03	3.72 ± 0.04
Abdominal fat (5)	1.32 ± 0.05^a	2.36 ± 0.04^b	1.84 ± 0.05

Means bearing same superscripts row-wise do not differ significantly ($P<0.01$).

The mean \pm SE blood yield percentage in male and female Beltsville Small White turkey were found to be 2.40 ± 0.04 and 2.12 ± 0.04 , respectively. Blood yield percentage male and female turkeys differ significantly ($P<0.01$) between them and value higher in male. Overall mean for

turkey blood yield percentage was 2.26 ± 0.04 . The mean \pm SE feather yield percentage in male and female Beltsville Small White turkey were found to be 6.58 ± 0.02 and 6.50 ± 0.05 , respectively. Lowest feather yield percentage observed in female turkey as compared to male turkey

and the feather yield percentage did not differ significantly between them. Overall mean for feather yield percentage was 6.54 ± 0.04 . The mean \pm SE intestines percentages in male and female Beltsville Small White turkey were found to be 4.52 ± 0.05 and 4.28 ± 0.03 , respectively. Intestine percentage turkeys differ significantly ($P < 0.01$) between male and female turkey. Overall mean for turkey intestine percentage was 4.40 ± 0.04 . The mean \pm SE giblets yield percentage in male and female Beltsville Small White turkey were found to be 3.78 ± 0.05 and 3.69 ± 0.02 , respectively. Giblets percentage of male and female turkeys differ significantly ($P > 0.01$) between them. Higher giblets percentage observed in male turkeys and lower giblets percentage observed in female turkey. Overall mean for turkey giblets percentage was 3.74 ± 0.04 . The mean \pm SE feet yield percentage in male and female Beltsville Small White turkey were found to be 3.73 ± 0.05 and 3.71 ± 0.03 , respectively. Lowest feet percentage observed in female turkey and the value did not differ significantly from male turkey. Overall mean for feet yield percentage was 3.72 ± 0.04 . The mean \pm SE abdominal fat percentages in male and female Beltsville Small White turkey were found to be 2.36 ± 0.04 and 1.32 ± 0.05 , respectively. Males had significantly ($P > 0.01$) higher abdominal fat percentage than female turkey. Chodova *et al.*, (2014) also found significantly higher abdominal fat content in male turkeys. Overall mean for turkey abdominal fat percentage was 1.84 ± 0.05 .

Carcass characteristics

Effects of sex on carcass characteristics of Beltsville Small White turkey are presented in Table 2. The mean \pm SE head yield percentages in male and female Beltsville Small White turkey were found to be 2.34 ± 0.05 and 2.31 ± 0.04 , respectively. Higher head percentage observed in male turkey and lower head percentage observed in female turkey. Head yield percentage between male and female turkeys did not differ significantly between them. Overall mean for turkey head yield percentage was 2.32 ± 0.05 . The mean \pm SE neck yield percentage in male and female Beltsville Small White turkey were found to be 6.70 ± 0.04 and 6.17 ± 0.02 , respectively. Higher neck yield percentage observed in male turkey and lower head percentage observed in female turkey. Neck yield percentage between male and female Beltsville Small White turkey differed significantly between them. This was in agreement with Ramkrishana *et al.*, (2012) who found higher percentage of neck in male turkeys. Overall mean for turkey neck yield percentage was 6.44 ± 0.04 . The mean \pm SE wings percentage in male and female Beltsville Small White turkeys were found to be 12.72 ± 0.04 and 12.11 ± 0.05 , respectively. Higher wings percentage observed in male turkeys and the wings percentages of turkeys differ significantly ($P > 0.01$) between them. Overall mean for Beltsville Small White turkey wing percentage was 12.42 ± 0.05 .

The mean \pm SE breast yield percentages in male and female Beltsville Small White turkey were found to be

31.74 ± 0.02 and 30.58 ± 0.04, respectively. Higher breast yield percentage observed in male turkey and lower breast yield percentage observed in

female turkey and the breast yield percentage differ significantly ($P > 0.01$) between them.

Table 2: Effect of sex on carcass characteristics of Beltsville Small White turkey (*Meleagris gallopavo*) (Mean ± SE)

Carcass characteristics	Male	Female	Overall mean ± SE
Head (%)	2.34±0.05	2.31 ±0.04	2.32±0.05
Neck (%)	6.70±0.04 ^a	6.17±0.02 ^b	6.44±0.03
Wings (%)	12.72±0.04 ^a	12.11±0.05 ^b	12.42±0.05
Beast (%)	31.74±0.02 ^a	30.58±0.04 ^b	31.16±0.03
Back (%)	18.10±0.04 ^a	17.78±0.05 ^b	17.94±0.05
Thighs (%)	16.45±0.02 ^a	15.62±0.04 ^b	16.54±0.03
Drumstick (%)	12.95±0.04 ^a	13.80±0.04 ^b	13.38±0.04

Means bearing same superscripts row-wise do not differ significantly ($P < 0.01$).

Overall mean for Beltsville Small White turkey breast yield percentage was 31.16±0.03. The mean ± SE back yield percentage in male and female Beltsville Small White turkey were found to be 18.10±0.04 and 17.78±0.05, respectively. The average back yield percentage between male and female turkey differ significantly ($P > 0.01$) between them. The highest back yield percentage found male turkey followed by female turkey. Overall mean for turkey back yield percentages were 17.94±0.04. The mean ± SE thighs yield percentage in male and female Beltsville Small White turkey were found to be 16.45 ±0.02 and 15.62±0.04, respectively. The average thighs yield percentage between male and female turkey differed significantly ($P > 0.01$) between them. The highest thighs yield percentage found in male turkey followed by female turkey. The higher leg yields were also observed in males in the work of Fanatico *et al.*, (2005). Overall mean for turkey thighs yield percentages were

16.54±0.03, respectively. The mean ± SE drumstick yield percentages in male and female Beltsville Small White turkey were found to be 12.95±0.04 and 13.80±0.04, respectively. Higher drumstick yield percentage observed in female turkey and lower drumstick yield percentage observed in male turkey. Drumstick yield percentage between male and female turkeys differed significantly between them. Overall mean for turkey drumstick yield percentage was 13.38±0.04. The result is in accordance with Young *et al.*, (2001) found that female turkeys had higher percent yields of drumstick meat.

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