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SLAUGHTER AND CARCASS CHARACTERISTICS OF BELTSVILLE SMALL WHITE AND BROAD BREASTED BRONZE TURKEYS (*Meleagris gallopavo*)

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Abstract: The study was conducted to compare the slaughter and carcass quality traits of Beltsville Small White and Broad Breasted Bronze Turkeys (*Meleagris gallopavo*) under the hot humid climatic condition. Beltsville Small White and Broad Breasted Bronze turkeys were raised in an intensive system of management and the birds maintained under standard management practices. 40 Turkeys (20 Beltsville Small White and 20 Broad Breasted Bronze Turkeys) were slaughtered by following standard procedures. Slaughter and carcass characteristics of Beltsville Small White and Broad Breasted Bronze Turkeys were recorded and compared. Broad Breasted Bronze Turkey yielded significantly (P>0.01) higher live weight (kg), carcass weight (kg), dressing percentage (%), feathers (%), intestines (%), giblets (%), feet(%), head (%), neck (%), wings (%), breast (%), back (%), thighs (%) and drumstick (%) than Beltsville Small White Turkeys. Blood (%) and abdominal fat (%) yield values between Beltsville Small White and Broad Breasted Bronze turkeys did not differ significantly. From these results, it is concluded that, Broad Breasted Bronze turkeys is more suitable for to obtain better slaughter and carcass traits and higher meat production under Indian hot humid climatic condition.

Keywords: Turkey, Beltsville Small White, Broad Breasted Bronze, climate, hot humid, slaughter, carcass, traits, cut up parts

Introduction

Turkey (*Meleagris gallopavo*) occupies an important position next to chicken, duck, guinea fowl and quail. The turkey, a well known bird in western countries, but in the rest of the world especially in developing countries it is yet to be established on commercial point of view. Board breasted bronze, Board breasted white and Beltsville small white are commonly available three turkey varieties in India. The bird is quite suitable for upliftment of small and marginal farmers as it can be easily reared with little investment for housing, equipment and management (Anna Anandh *et al.,* 2012). Commercial turkey farming is becoming popular in India and farmers started to show interest in rearing turkey birds. Recently, the consumption of turkey meat is increasing worldwide and a similar trend is also emerging in India. Turkey

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meat has tremendous commercial viability because of its low fat and cholesterol content in comparison to red meat and other poultry meat. Growth performance enhancements have also been accompanied by significant changes in the composition and component yields of turkey carcasses (Lilburn and Nestor, 1991). 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). The choice of strain, sex and age at slaughter affect the production of edible carcass and offal components. It is very important to know the factors influencing the yield and quality of the carcass. Information on slaughter and carcass components of turkeys is also not available in Indian hot humid climatic condition. Since scanty published literature is available on slaughter and carcass characteristics of turkey birds under in Indian hot humid climatic condition, the present study was conducted to determine the slaughter and carcass characteristics of Beltsville Small White and Broad Breasted Bronze turkeys as well as to identify the suitable turkey for better meat production under Indian hot humid climatic conditions.

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 and Broad Breasted Bronze turkey 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 Beltsville Small White and 25 Broad Breasted Bronze) 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 Beltsville Small White and 20 Broad Breasted Bronze) 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 (Anna Anandh, 2017).

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 turkey varieties on slaughter and carcass characteristics.

Results and Discussion

Slaughter characteristics: Slaughter characteristics of Beltsville Small White and Board breasted bronze turkeys are presented in Table 1. The mean ± SE slaughter and carcass weight in the Beltsville Small White and Board breasted bronze turkey were found to be 5.77 ± 0.08 and 6.47 ± 0.04 and 4.43 ± 0.02 and 5.20 ± 0.05, respectively. The results also showed that Board breasted bronze turkeys had heavier slaughter and carcass weights than Beltsville Small White. The mean slaughter and carcass weight between Beltsville Small White and Board breasted bronze turkeys differ significantly (P>0.01) between them. Overall mean for Beltsville Small White turkey slaughter and carcass weight were 6.12 ± 0.04 and 4.82 ± 0.04, 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 ± SE dressing percentage in Beltsville Small White and Board breasted bronze were found to be 76.77 ± 0.04 and 80.37 ± 0.05, respectively. The highest dressing percentage was found in Board breasted bronze turkey. Overall mean for turkey dressing percentage was 78.17±0.05. The mean ± SE blood yield percentage in Beltsville Small White and Board breasted bronze turkey were found to be 2.71 ± 0.04 and 2.75 ± 0.06, respectively. Blood yield percentage Beltsville Small White and Board breasted bronze turkeys did not differ significantly between them and value higher in Board breasted bronze turkeys. Overall mean for turkey blood yield percentage was 2.73 ± 0.05. The mean ± SE feather yield percentage in Beltsville Small White and Board breasted bronze turkey were found to be 7.58 ± 0.03 and 8.77 ± 0.03, respectively. Significantly (P>0.01) lowest feather yield percentage observed in Beltsville Small White turkey as compared to Board breasted bronze turkey and the feather yield percentage differ significantly between them. Overall mean for feather yield percentage was 8.18 ± 0.04. The mean ± SE intestines percentages in Beltsville Small White and Board breasted bronze turkey were found to be 4.86 ± 0.06 and 5.37 ± 0.03, respectively. Intestine percentage turkeys differ

significantly (P<0.01) between Beltsville Small White and Board breasted bronze turkey. Overall mean for turkey intestine percentage was 5.12 ±0.05. The mean ± SE giblets yield percentage in Beltsville Small White and Board breasted bronze turkey were found to be 3.66 ± 0.04 and 4.99 ± 0.04, respectively. Giblets percentage of Beltsville Small White and Board breasted bronze turkeys differ significantly (P>0.01) between them. Higher giblets percentage observed in male turkeys and lower giblets percentage observed in Board breasted bronze. Overall mean for turkey giblets percentage was 4.33 ± 0.04. The mean ± SE feet yield percentage in Beltsville Small White and Board breasted bronze were found to be 3.76 ± 0.05 and 4.94 ± 0.04, respectively. Lowest feet percentage observed in Beltsville Small White and the value differ significantly (P>0.01) from Board breasted bronze turkey. Overall mean for feet yield percentage was 3.35±0.05. The mean ± SE abdominal fat percentages in Beltsville Small White and Board breasted bronze turkey were found to be 1.49 ± 0.04 and 1.56 ± 0.04, respectively. Board breasted bronze turkey had higher abdominal fat percentage than Beltsville Small White turkey and the value did not differed significantly between them. Overall mean for turkey abdominal fat percentage was 1.58 ± 0.04.

It can be said that differences in slaughter characteristics were completely happened due to the different genotypes. Differences of body weights and slaughter traits between this study and literature data have due to different genotypes, growing conditions etc. Bilgili *et al.*, (2006) observed that the processing yields of broilers were influenced by strain-cross. Ramakrishna *et al.* (2012) obtained differences in slaughter characteristics for different commercial hybrid strains. The carcass weight and yield were significantly affected by genotype (Sarica *et al.,* 2009). This difference may be due to the improvement in genetic characteristic of the hybrid strain. The result on slaughter characteristics of this study is in accordance with overall findings of Isguzar (2003).

Carcass characteristics: Carcass characteristics of Beltsville Small White and Board breasted bronze turkeys are presented in Table 2. The mean ± SE head yield percentages in Beltsville Small White and Board breasted bronze turkey were found to be 2.31 ± 0.02 and 3.12 ± 0.02, respectively. Higher head percentage observed in Board breasted bronze turkey and lower head percentage observed in Beltsville Small White turkey. Head yield percentage between Beltsville Small White and Board breasted bronze turkey turkeys differ significantly (P>0.01) between them. Overall mean for turkey head yield percentage was 2.72 ± 0.02. The mean ± SE neck yield percentage in Beltsville Small White and Board breasted bronze turkey were found to be 6.57 ± 0.02 and 7.22 ± 0.02, respectively. Higher neck yield percentage

observed in Board breasted bronze turkey and lower head percentage observed in Beltsville Small White turkey. Neck yield percentage between Beltsville Small White and Board breasted bronze turkey differed significantly (P>0.01) between them. Overall mean for turkey neck yield percentage was 6.90 ± 0.02. The mean ± SE wings percentage in Beltsville Small White and Board breasted bronze turkeys were found to be 12.18 ± 0.04 and 13.45 ± 0.02, respectively. Higher wings percentage observed in Board breasted bronze turkeys and the wings percentages of turkeys differ significantly (P>0.01) between them. Overall mean for turkey wing percentage was 12.82±0.03. The mean ± SE breast yield percentages in Beltsville Small White and Board breasted bronze turkeys were found to be 25.53 ± 0.02 and 31.14 ± 0.05, respectively. Higher breast yield percentage observed in Board breasted bronze turkey and lower breast yield percentage observed in Beltsville Small White turkey and the breast yield percentage differ significantly (P>0.01) between them. Overall mean for Beltsville Small White and Board breasted bronze turkeys breast yield percentage was 28.34 ± 0.03. The mean ± SE back yields percentage in Beltsville Small White and Board breasted bronze turkeys were found to be 17.03 ± 0.03 and 17.87 ± 0.05, respectively. The average back yield percentage between Beltsville Small White and Board breasted bronze turkeys differ significantly (P>0.01) between them. The highest back yield percentage observed in Board breasted bronze turkey followed by Beltsville Small White turkey. Overall mean for turkey back yield percentages were 17.95 ± 0.04. The mean ± SE thighs yield percentage in Beltsville Small White and Board breasted bronze turkeys were found to be 14.39 ± 0.02 and 16.23 ± 0.04, respectively. The average thighs yield percentage between Beltsville Small White and Board breasted bronze turkeys differed significantly (P>0.01) between them. The highest thighs yield percentage found in Board breasted bronze turkey followed by Beltsville Small White turkey. Overall mean for turkey thighs yield percentages were 15.31 ± 0.03, respectively. The mean ± SE drumstick yield percentages in Beltsville Small White and Board breasted bronze turkeys were found to be 13.25 ± 0.04 and 14.72 ± 0.04, respectively. Higher drumstick yield percentage observed in Board breasted bronze turkeys and lower drumstick yield percentage observed in Beltsville Small White turkey. Drumstick yield percentage between Beltsville Small White and Board breasted bronze turkeys differed significantly between them. Overall mean for turkey drumstick yield percentage was 13.98±0.03.

Roberson *et al.*, (2003) also reported that the carcass components and meat quality characteristics of three commercial strains of tom turkeys had few differences in carcass

components between strains. Difference in the findings in the present study also may be due to the variation in strains (Ramakrishna *et al.,* 2012). The results on carcass characteristics of this study are within the range of values cited in the literature of Isguzar (2003).

Conclusion

From these results, it is concluded that, slaughter and carcass characteristics of Beltsville Small White and Board breasted bronze turkeys were comparable and Board breasted bronze turkeys were yielded higher slaughter and carcass traits. Therefore, Board breasted bronze turkeys is more suitable for to obtain better slaughter and carcass traits as compared to Beltsville Small White turkeys under Indian hot humid climatic condition.

References

[1] Anna Anandh, M. 2017. Effect of rearing systems on slaughter and carcass characteristics of turkey (*Meleagris gallopavo*). *Res. J. Animal Hus. & Dairy Sci.,* 8: 46-50.

[2] Anna Anandh, M., Richard Jagatheesan, P.N., Senthil Kumar, P., Paramasivam, A. and Rajarajan, G. 2012. Effect of rearing systems on reproductive performance of turkey. *Vet. World*, 5:226-229.

[3] Bilgili, S.F., M.A. Alley, J.B. Hess and M. Nagaraj, 2006. Influence of age and sex on footpad quality and yield in broiler chickens reared on low and high density diets. *J. Appl. Poult. Res.*, 15: 433- 441.

[4] Isguzar, E. 2003. Growth, carcass traits and meat quality of Bronze and White turkeys in Isparta province of Turkey. *Arch. Tierz., Dummerstor.,* 46 :471-481

[5] Lilburn, M.S. and Nestor, K.E. 1991. Body weight and carcass development in different lines of turkeys. *Poult. Sci.*, 70:2223–2231.

[6] Oblakova, M. (2004). Stady of growth potentials and slaughter analysis of BUT- 9 broiler turkey poults. *Bulgarian J Ani. Sci.*, 10:137-142,

[7] Ramkrishna, R.S., Sheriff, F.R. and Raj Manohar, G. (2012). Growth performance and carcass yields as influenced by age and sex in different turkey varieties. *Tamil nadu J. Vet. & Ani. Sci., 8: 94-100.*

[8] Roberson, K.D., Rahn, A.P., Balander, R.J., Orth, M.V., Smith, D.M., Booren, B.L., Booren, A.M., Osburn, W.N. and Fulton, R.M. 2003. Evaluation of the growth potential, carcass components and meat quality characteristics of three commercial strains of tom turkeys. *J. Appl. Poult. Res.,* 12:229–236.

[9] Shahin, K.A. and F.A. Elazeem. 2005. Effects of breed, sex and diet and their interactions on carcass composition and tissue weight distribution of broiler chickens. *Arch. Tierztl.,* 48: 612 –626.

[10] Sarica, M., Ocak, N., Karacay, N., Yamak, U., Kop, C. and Altop, A. 2009. Growth, slaughter and gastrointestinal tract traits of three turkey genotypes under barn and free-range housing systems, *British Poult. Sci.,* 50: 487-494.

[11] Snedecor, G.W. and Cochran, W.G. 1989. Statistical methods. 8th ed. Oxford and IBH Publishing Co., Calcutta.

Table 1: Slaughter characteristics of Beltsville Small White and Broad Breasted Bronze turkeys (Mean ± SE)

Slaughter Characteristics	Beltsville Small White	Broad Breasted Bronze	Overall mean ± SE
Slaughter weight (gm)	5.77 ±0.04 [a]	6.47 ± 0.04 [b]	6.12 ± 0.04
Carcass weight (gm)	4.43 ± 0.02 [a]	5.20 ± 0.05 [b]	4.82 ± 0.04
Dressing percentage (%)	76.77 ± 0.04 [a]	80.37 ± 0.05 [b]	78.57 ± 0.05
Blood (%)	2.71 ± 0.04	2.75 ± 0.06	2.72 ± 0.05
Feathers (%)	7.58 ± 0.03 [a]	8.77 ± 0.03 [b]	8.18 ± 0.03
Intestines (%)	4.86 ± 0.06 [a]	5.37 ± 0.05 [b]	5.12 ± 0.05
Giblets (%)	3.66 ± 0.04 [a]	4.99 ± 0.04 [b]	4.33 ± 0.04
Feet (%)	3.76 ± 0.05 [a]	4.94 ± 0.04 [b]	4.35 ± 0.05
Abdominal fat (5)	1.49 ± 0.03	1.56 ± 0.04	1.53 ± 0.04

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

Table 2: Carcass characteristics of Beltsville Small White and Broad Breasted Bronze turkeys (Mean ± SE)

Carcass characteristics	Beltsville Small White	Broad Breasted Bronze	Overall mean ± SE
Head (%)	2.31 ± 0.02 [a]	3.12 ± 0.02 [b]	2.72 ± 0.02
Neck (%)	6.57 ± 0.02 [a]	7.22 ± 0.02 [b]	6.90 ± 0.02
Wings (%)	12.18 ± 0.04	13.45 ± 0.02	12.82 ± 0.03
Beast (%)	25.53 ± 0.02[a]	31.14 ± 0.05 [b]	28.34 ± 0.04
Back (%)	17.03 ± 0.03 [a]	18.87 ± 0.05 [b]	17.95 ± 0.04
Thighs (%)	14.39 ± 0.02 [a]	16.23 ± 0.04 [b]	15.31 ± 0.03
Drumstick (%)	13.25 ± 0.04 [a]	14.72 ± 0.02 [b]	13.98 ± 0.03

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