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Sexual Dimorphism in Carcass Traits of Duck

A.O. Fadare and T.O. Olashore,

Department of Animal and Environmental Biology, Adekunle Ajasin University, Akungba-Akoko, Ondo State, Nigeria

Corresponding author: A.O. Fadare; E-mail: delodunfadare@gmail.com; Phone: +2348034782356.

Abstract

The variation in carcass traits of male and female duck was evaluated at the poultry unit of the Department of Animal and Environmental Biology, Adekunle Ajasin University, Akungba-Akoko, Nigeria. Thirty male and female ducks were raised under the same management condition for twelve weeks and slaughtered. Data collected include slaughter weight, plucked carcass weight, edible carcass, dressing yield, primal cut outs and internal organ weights. Analysis of variance showed that there was no significant difference ($p > 0.05$) in slaughter weight and some of the primal cut outs (wings, breast muscle, leg and head) of male and female duck. However, there was significant difference ($P < 0.05$) in the plucked carcass weight and edible carcass of male and female duck. Male duck had higher plucked carcass weight and edible carcass (1210.00 ± 29.02 and 1050.00 ± 35.04 g, respectively) compared with female duck (with 1110 ± 36.49 g and 980.00 ± 10.08 g respectively). Liver and gizzard weights were also significantly ($P < 0.05$) higher in male than female ducks. Sexual dimorphism was also observed in the gastro intestinal tract of duck. Female duck had higher intestine weight than their male counterparts. However, the dressing yields of male ($68.40 \pm 1.29\%$) and female ($62.60 \pm 6.21\%$) ducks were not statistically different. In conclusion, sexual dimorphism exists in carcass traits of duck.

Keywords: carcass traits, dressing yield, sexual dimorphism, duck

Introduction

Domestic duck is one of the neglected poultry species despite its nutritional value and unique taste. In addition to high protein, duck meat is also characterized by low fat content. Duck also have ability to protect itself against predators and has better resistance to common poultry parasites and diseases. The evaluation and comparison of meat traits of neglected poultry specie may arouse the interest of potential producers of the species (Bernacki *et al.*, 2012). According to Baeza *et al.* (2000), sexual dimorphism (differences in male and female) do not exist in body weight of duck at any given age and it is thus possible to rear both sexes together and slaughter at the same age. Steczny *et al.* (2017) also reported that there was no significant difference in the body weight of male and female duck and found that the sex of ducks had no significant effect on the percentage of wings, breast muscles, legs, skin with subcutaneous fat and carcass offals. However, Kokoszynski (2011) reported lower dressing percentage of 69.8% in male duck compared with 72.7% found in female duck.

This study was therefore carried out to investigate the carcass characteristics of male and female duck raised in a humid tropical environment.

Materials and Methods

The experiment was carried out at the poultry unit of the Department of Animal and Environmental Biology, Adekunle Ajasin University Akungba-Akoko, Ondo State. Thirty male and female ducks were raised under the same management condition. They were fed with commercial pelleted diet containing 17% Crude protein, 7% fat, 10% Crude fibre, 1.0% Calcium, together with available phosphorus of 0.35% and 2550Kcal/kg metabolisable energy. Clean water was also supplied to the birds *ad libitum*.

At 12 weeks of age, the ducks were weighed and slaughtered. Each bird was bled and weighed to determine the blood weight. The feathers were plucked and the bird re-weighed. The head was separated and the internal organs were also removed and weighed. Primal carcass parts were also weighed. The inedible parts were also measured with a sensitive scale.

Data obtained from the study were analyzed using SAS 2010.

Results and Discussion

The least square means of the carcass composition presented in table 1 shows that there were significant differences ($p < 0.05$) in carcass weight and edible carcass of male and female duck. Male duck had higher plucked carcass weight and edible carcass (1210.00 ± 29.02 and 1050.00 ± 35.04 g respectively) compared with female duck (with 1110 ± 36.49 g and 980.00 ± 10.08 g respectively). The dressing yields of male ($68.40 \pm 1.29\%$) and female ($62.60 \pm 6.21\%$) ducks were not statistically different ($p > 0.05$) in this study. The thorax weight was significantly ($p < 0.05$) higher in male duck compared with their female counterparts in this study. Breast muscle tissue is one of the most valuable component of the carcass of duck (Omojola, 2007). In this study, sexual dimorphism was not found in the weight of breast muscle as well as wings of both sexes as shown on Table 2. This corroborates the report of Steczny *et al.* (2017) that there was no significant difference in wings and breast muscle of male and female duck. Kokoszynski (2011) also found that percentage weight of breast muscle was similar in both male and female

duck. The weight of leg and head were also statistically similar for male and female duck in this study. Table 3 shows the means and standard error of means of the internal organs of male and female ducks. There was no significant difference ($p>0.05$) in the heart weight of both sexes of duck. However, liver and gizzard weights were significantly ($p<0.05$) higher in male than female ducks as shown in Table 3. This is in line with the report of Wasilewski *et al.* (2015) that greater proportion of gizzard was found in male than female duck. According to Kokoszynski *et al.* (2017), the high proportion of gizzard in the body of birds may be indicative of good muscle which has a positive impact on the particle size of digesta and nutrient absorption. Contrary to the report of Steczny *et al.* (2017) that there was no significant difference in carcass offals, the values of gastro intestinal tract in female was higher than that of male duck in this study. Omojola (2007) also reported that the sex of duck has effect on intestinal size.

Table 1: Mean and SEM of carcass composition in male and female duck

Parameters	Female	Male
Pre-slaughter wt (g)	1220.00± 71.41	1370.00 ±29.02
Slaughter weight (g)	1170.00 ± 73.14	1240.00± 67.82
Plucked weights(g)	1110 ± 36.49 ^b	1210.00 ± 29.02 ^a
Edible carcass (g)	980.00 ±10.08 ^b	1050.00 ±35.04 ^a
Dressing yield (%)	62.60 ± 6.21%	68.40 ± 1.29

^{ab}Mean on the same row with different superscripts are significantly ($p<0.05$) different.

Table 2: Mean and SEM of primal cut-out parts of male and female duck

Parameters	Female	Male
Thigh (g)	99.33± 11.09 ^b	109.06±12.74 ^a
Breast muscle(g)	182.53± 23.85	184.7 ± 18.26
Wing(g)	69.13. ±2.23	69.73 ± 4.32 ^a
Neck (g)	76.08± 4.81 ^b	104.11.±3.10 ^a
Leg (g)	17.03± 0.73	17.60.± 0.63
Thorax(g)	196.04± 10.81 ^b	218.11±6.88 ^a
Head (g)	88.30 ± 3.87	87.36± 7.11

^{ab}Mean on the same row with different superscripts are significantly ($p<0.05$) different

Table 3: Mean and SEM of the internal organs of male and female duck

Parameters	Female	Male
Heart(g)	8.18 ± 1.96	9.68 ± 1.18
Liver(g)	21.39± 2.67 ^b	26.12.± 1.13 ^a
Empty gizzard (g)	43.39 ± 3.02 ^b	48.77 ± 2.64 ^a
Full gizzard (g)	50.85 ± 2.65 ^b	57.84.± 2.04 ^a
GIT (g)	76.49 ± 6.65 ^a	67.44 ± 4.17 ^b

^{ab}Mean on the same row with different superscripts are significantly ($p<0.05$) different; GIT - Gastro intestinal tract

Conclusion

There was no sexual dimorphism in the slaughter weight, dressing yield, weight of breast muscle, wings, leg and head and heart of duck. Nevertheless, male duck had higher plucked carcass weight, edible carcass, thorax, liver and gizzard weight while female had higher gastro intestinal weight.

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