COMPARISON OF CARCASS CHARACTERISTICS OF VIGOVA SUPER M AND KUTTANAD DUCKS*

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Received:10.06.2013
Accepted:16.08.2013

Abstract

Duck meat has combined properties of red and white meat and has high nutritional values. Kerala with its network of inland water sources is an ideal place for duck rearing. A study was undertaken to compare the carcass characteristics of native dual purpose Kuttanad ducks (5-6 months) with the exotic broiler strain of Vigova ducks (6-8 weeks). When compared to Kuttanad ducks, Vigova ducks exhibited significantly higher slaughter and carcass weights, carcass yields with skin, without skin and with giblets and higher abdominal fat. Vigova ducks had significantly lower yields of all inedible offals except blood and lungs. On the basis of carcass weight, yields of meat and bones were significantly higher for Kuttanad ducks, however, the meat: bone ratios did not differ significantly. Yield of skin was significantly higher for Vigova. Vigova ducks were superior in carcass characteristics and could be used for meat production at a young age, making it suitable for commercial broiler production.

Key words: *Carcass characteristics, Vigova Super M ducks, Kuttanad ducks*

Poultry meat is of high nutritional value having good source of protein. Though the majority of poultry meat in India is constituted by chicken, duck meat is gaining an increase demand due to its nutritional properties. (Khalequzzaman *et al.,* 2006; Adzitey and Adzitey, 2011; Kanagaraju *et al*., 2012).

Duck meat production in India was 37, 700 tonnes in 2010 (FAOSTAT, 2010). It has combined characteristics of red meat - contains high levels of phospholipids, precursors of aromas and the dietetic characteristics of poultry meat - contains high levels of monounsaturated fatty acids, especially oleic and linoleic acid and constitutes about 60 per cent of fatty acids.

Vigova Super M (Super Meat) duck is a broiler strain of duck which is a cross of White Pekin and Aylesbury, having high disease resistance, faster growth rate and good feed conversion efficiency. These are ideally suited for the Indian climate and are gaining popularity in India. Kuttanad ducks are the most popular ducks of Kerala and are the indigenous ducks which include both *Chara and Chemballi* varieties. They are reared in large flocks in the paddy fields of Kuttanad area in Kerala and are mainly kept for egg production, but are dual purpose in nature with high disease resistance and good adaptability.

Only very few works had been so far conducted on the carcass and meat quality characteristics of Vigova and Kuttanad ducks.

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Hence a study was envisaged with the objectives of evaluating and comparing the carcass quality characteristics of Vigova and Kuttanad ducks.

Materials and Methods

Twelve ducks of Vigova Super M (cross of White Pekin and Aylesbury) aged six to eight weeks and of either sex purchased from local farmers and twelve Kuttanad ducks (cross of *Chara* and *Chemballi*) aged 5 to 6 months and of similar weight and of either sex purchased from the University Poultry and Duck Farm (UPDF), Mannuthy were brought to the department, for slaughter. The birds were identified, individually weighed and fasted for 6 hours with access to adlibitum water. Ducks were scientifically and hygienically slaughtered in an automatic poultry processing line (RND Practical Engineering, Pune) in the department. The birds were stunned in an electrical water bath at a low voltage of 70 volts and bled by cutting across the jugular vein and carotid artery. Bleeding was carried out for two min and the weight after bleeding was recorded. The birds were subsequently scalded by immersion scalding in hot water at 60°C for two min, defeathered in a defeathering machine, singed and washed. Weights of dry feathers were recorded. Evisceration was carried out as per the standard technique by cutting below the breast bone cartilage. Edible and inedible offals were removed from the carcasses and weighed separately. After slaughtering and dressing, the warm carcass weights were recorded. The characteristics assessed were slaughter weight, carcass weight, carcass yield, yield of inedible offals, abdominal fat, giblets and meat and meat: bone ratio. The carcass characteristics of Vigova and Kuttanad ducks were compared and evaluated. The data obtained were statistically analyzed by Independent *t*-test, using SPSS soft ware as per Snedecor and Cochran (1994).

Results and Discussion

Results of slaughter weights, carcass weights and carcass yields of Vigova and Kuttanad ducks are presented in Table 1. Vigova ducks showed significantly higher (P<0.01) slaughter and carcass weights when compared to Kuttanad ducks. Kuttanad duck being a dual purpose duck attained a body weight of 1467.54±28.55 g at six months and this was in agreement with findings of Sapcota *et al.* (2009) who reported a slaughter weight of 1515 g at six months in Kuttanad ducks.

Carcass yield (per cent) without skin, with skin and with giblets were significantly higher (P<0.01) for Vigova ducks compared to those of Kuttanad ducks. This might be due to the broiler properties of Vigova ducks, which are mainly used for meat production (Banerjee, 2011). Mean carcass yields (per cent) without skin and subcutaneous fat and with skin were significantly higher (P<0.01) for Vigova ducks (50.10±0.23 per cent and 70.06±0.25 per cent respectively), when compared to Kuttanad ducks (49.50±0.26 per cent and 63.88±0.29 per cent respectively). Vigova ducks also showed significantly higher (P<0.01) mean carcass yield (per cent) with giblets in comparison to that of Kuttanad ducks. Mean carcass yield of Vigova ducks without skin was 70.06±0.25 per cent and this was in agreement with the findings of Bhuiyan *et al*. (2005); Kleczek *et al*. (2007); Omojola (2007) and Teguia *et al.* (2008) who reported dressing per cent values around 70 per cent in different broiler strains of ducks. Mean carcass yield without skin was 50.10±0.23 per cent in Vigova ducks and this agreed with the findings of Banerjee (2010) who reported a value of 50.10 per cent in Vigova Super M ducks aged eight weeks. Mean carcass yield (per cent) of Kuttanad ducks with skin and

Table 1. Slaughter weights, carcass weights and carcass yields of Vigova and Kuttanad ducks

Parameters	Treatment mean values	
	Vigova ducks	Kuttanad ducks
Slaughter weights (g)	2634.42±80.12[b]	1467.54±28.55[a]
Carcass weights (g)	1847.25±60.56[b]	937.92±20.66[a]
Carcass yields without skin (%)	50.10±0.23[b]	49.50±0.26[a]
Carcass yields with skin (%)	70.06 ±0.25[b]	63.88±0.29[a]
Carcass yields with giblet (%)	75.34±0.20[b]	69.82±0.29[a]

Means bearing same superscripts in the rows do not differ significantly (P<0.01).

subcutaneous fat was 63.88±0.29 which agreed with the results obtained by Chacko *et al.* (2009) and Sapcota *et al.* (2009).

Yield of different inedible offals and abdominal fat of Kuttanad and Vigova ducks are shown in Tables 2. Mean yield of total inedible offals (per cent) was higher for Kuttanad ducks (29.28±0.19) when compared to Vigova ducks (23.21±0.22) and the difference was significant (P<0.01). The mean yield of each inedible offal (per cent) was also significantly higher (P<0.01) for Kuttanad ducks when compared to Vigova ducks except for blood and lungs. It was observed that higher the yield of inedible offals, lower would be the carcass yield. Findings were in accordance with results obtained by Omojola (2007) in Muscovy and White Pekin ducks. Significant differences (P<0.01) were observed in the mean yields (per cent) of feather, feet, head, trachea and gastrointestinal tracts between the two groups of birds, which were in agreement with findings of Mahanta *et al*. (2000) and Omojola (2007). Kuttanad ducks showed mean yields of 4.12±0.13 per cent, 6.12±0.13 per cent and 3.08±0.05 per cent for blood, head and feet which agreed with the findings of Sapcota *et al*. (2009) who conducted studies in six month old *Chara-Chemballi* ducks.

Vigova ducks exhibited a significantly higher (P<0.01) mean yield of abdominal fat (0.92±0.04 per cent) when compared to Kuttanad ducks (0.76±0.01 per cent). Increased level of abdominal fat in Vigova ducks might be due to the broiler characteristics. The mean yields obtained were around one per cent for both groups of ducks and this was in accordance with the results obtained by Shahin (2000) in Pekin ducks of ten weeks age and Larzul *et al.* (2004) in female mule ducks of ten weeks age.

Yields of giblets are shown in Table 3. The mean yield of giblet was significantly higher (P<0.01) for Kuttanad ducks (5.94±0.07 per cent) when compared to that of Vigova ducks (5.28±0.10 per cent). Among giblets, mean value of liver was higher for Vigova ducks, while those for gizzard and heart were higher for Kuttanad. Increase in slaughter age increased the per cent of giblet, which was evident from the results and was in agreement with the findings of Teguia *et al.* (2008) and Sapcota *et al.* (2009). Mahanta *et al*. (2000) reported a giblet per cent of 6.12 in indigenous Assam ducks. Heart, liver and gizzard contributed to 0.68 per cent, 2.19 per cent and 3.09 per cent in Assam ducks, which were comparable with the results of present study.

Yields of meat, bone, skin and meat: bone ratios of Vigova and Kuttanad ducks are presented in Table 4. Mean yields of meat (per cent) expressed on slaughter weight basis did not differ significantly between Vigova and Kuttanad ducks. On carcass weight basis, Kuttanad ducks showed a significantly higher (P<0.05) mean meat yield than Vigova ducks. There was no significant difference in mean yield of bone based on slaughter weight between the ducks, but the value based on carcass weight was significantly higher (P<0.05) for Kuttanad ducks. The mean yields of skin, based on slaughter and carcass weights were

Table 2. Yield of inedible offals of Vigova and Kuttanad ducks (percent)

Parameters %	Treatment mean values	
	Vigova ducks	Kuttanad ducks
Blood	4.03±0.11[a]	4.12±0.13[a]
Feather	5.72±0.09[b]	6.66±0.14[a]
Feet	2.75±0.05[a]	3.08±0.05[b]
Head	4.87±0.12[a]	6.12±0.13[b]
Trachea	0.70±0.02[a]	0.83±0.03[b]
Lungs	0.83±0.03[a]	0.93±0.03[a]
Gastrointestinal tract	4.31±0.10[a]	7.56±0.13[b]
Abdominal fat	0.92±0.04[b]	0.76±0.01[a]
Total inedible offals	23.21±0.22[a]	29.28±0.19[b]

Means bearing same superscripts in the rows do not differ significantly (P<0.01).

Table 3. Yield of giblets of Vigova and Kuttanad ducks (per cent)

Parameters %	Treatment mean values	
	Vigova ducks	Kuttanad ducks
Gizzard	2.35±0.05[a]	2.97±0.06[b]
Liver	2.19±0.66[a]	2.14±0.03[a]
Heart	0.74±0.03[a]	0.83±0.03[a]
Giblet	5.28±0.10[a]	5.94±0.07[b]

Means bearing same superscripts in the rows do not differ significantly (P<0.01).

Table 4. Yield of meat and meat: bone ratios of Vigova and Kuttanad ducks based on slaughter weight and carcass weight

Parameters	Based on slaughter weight		Based on carcass weight	
	Vigova ducks	Kuttanad ducks	Vigova ducks	Kuttanad ducks
Meat yield (%)	29.38±0.28[a]	29.6 ±0.40[a]	41.94±0.39[a]	46.35±0.70[b]
Bone (%)	18.82±0.27[a]	18.04±0.29[a]	26.86±0.37[a]	28.26±0.42[b]
Skin (%)	19.96±0.23[b]	14.37±0.40[a]	28.58±0.31[b]	22.49±0.54[a]
Meat and skin (%)	49.34±0.30[b]	43.98±0.32[a]	70.52±0.03[b]	68.84±0.46[a]
Meat: bone ratio	1.57±0.03[a]	1.65±0.05[a]	1.57±0.03[a]	1.65±0.05[a]
Meat and skin: bone ratio	2.63±0.04[b]	2.45±0.05[a]	2.63±0.04[b]	2.45±0.05[a]

Means bearing same superscripts in the rows do not differ significantly (P<0.05).

significantly higher (P<0.05) for Vigova ducks (19.96±0.23 per cent and 28.58±0.31 per cent respectively) when compared to Kuttanad ducks (14.37±0.40 per cent and 22.49±0.54 per cent respectively). Mean meat yield including the skin was significantly higher (P<0.05) for Vigova ducks. Significantly higher (P<0.01) yields (per cent) of giblets and inedible offals in Kuttanad ducks might have contributed to the insignificant difference in meat yields between Kuttanad and Vigova ducks when calculated on the basis of slaughter weight.

Mean meat: bone ratios expressed on the basis of both slaughter and carcass weights basis did not differ significantly between Vigova and Kuttanad ducks. Mean meat: bone ratio including the skin were significantly higher (P<0.05) for Vigova ducks. Significantly higher (P<0.05) yield of skin in Vigova ducks resulted in a significantly higher (P<0.05) meat and skin yield (per cent) and meat and skin: bone ratio in these ducks when compared to those of Kuttanad ducks. Meat and skin yield values of Vigova ducks agreed with the findings of Wawro *et al*. (2004); Witkiewicz *et al*. (2004); Kleczek *et al.* (2007), Bernacki *et al.* (2008) and Kokoszynski and Bernacki (2010).

From the results it could be inferred that Vigova ducks at six to eight weeks of age were superior in carcass characteristics, having higher slaughter and carcass weights, higher yields of carcass, meat and cut up parts when compared to Kuttanad ducks at six months of age. This could be due to the broiler characteristics of Vigova ducks which included good fleshing properties. The results revealed that Vigova ducks at a young age, could be used as an ideal broiler bird on commercial basis.

Acknowledgement

The authors are thankful to the Dean, College of Veterinary and Animal Sciences, Mannuthy for the facilities provided

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