

# Yields and Ratios of Different Meat Parts of Vigova Super M and Kuttanad Ducks: A Comparison

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**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 yields and ratios of meat parts of native dual purpose Kuttanad ducks (5-6 months) with the exotic broiler strain of Vigova ducks (6-8 weeks) based on slaughter and carcass weight. When compared to Kuttanad ducks, Vigova ducks exhibited significantly higher slaughter and carcass weights, breast meat and skin yield and its ratios, showing that it is typically a broiler breed of duck. Leg meat yield and ratios with and without skin was higher for Vigova duck which differed significantly ( $P < 0.05$ ). Mean meat yield including the skin, mean meat: bone ratio including the skin were significantly higher ( $P < 0.05$ ) for Vigova ducks. More meat along with skin contributed to broiler aspects of Vigova ducks due to its fleshing properties. Vigova ducks were superior in carcass yield and could be used for meat production at a young age, making it suitable for commercial broiler production.

Keywords: Yield, ratio, Vigova Super M duck, Kuttanad duck

## 1. Introduction

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. (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 yields and ratios of different meat parts of Vigova and Kuttanad ducks based on slaughter and carcass weight. Hence a study was envisaged with the objectives of evaluating and comparing the different yields and ratios of meat parts of Vigova and Kuttanad ducks.

## 2. Materials and Methods

Twenty 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 twenty 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 ad libitum 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 were subsequently scalded by immersion scalding in hot water at 60°C for two min, defeathered in a defeathering machine, singed and washed. 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. After slaughtering and dressing, the warm carcass weights were recorded. The dressed carcasses were separated into different meat parts - legs, (thigh and drumstick), breast, back, wings and neck. The characteristics assessed were slaughter weight, carcass weight, yield and ratios of different meat parts.

The values of Vigova and Kuttanad ducks obtained were compared and evaluated. The data obtained were statistically analyzed by Independent *t*-test, using SPSS soft ware as per Snedecor and Cochran (1994).

### 3. Results and Discussion

Results of slaughter weights, carcass weights 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  $1467.54 \pm 28.55$  g at six months and this was in agreement with findings of Sapkota *et al.* (2009) who reported a slaughter weight of 1515 g at six months in Kuttanad ducks.

**Table 1:** Slaughter weights and carcass weights of Vigova and Kuttanad ducks

| Parameters            | Treatment mean values |                       |
|-----------------------|-----------------------|-----------------------|
|                       | Vigova ducks          | Kuttanad ducks        |
| Slaughter weights (g) | $2634.42 \pm 80.12^b$ | $1467.54 \pm 28.55^a$ |
| Carcass weights (g)   | $1847.25 \pm 60.56^b$ | $937.92 \pm 20.66^a$  |

Mean  $\pm$  SE with different superscripts in the rows differ significantly ( $P<0.01$ )

Results of yields and ratios of different meat parts of Vigova and Kuttanad ducks are presented in Table 2. Breast meat and skin yield and its ratios differed significantly ( $P<0.05$ ) between two groups of ducks with value being higher for Vigova duck, showing that it is typically a broiler breed of duck. Leg meat yield and ratios with and without skin was higher for Vigova duck which differed significantly ( $P<0.05$ ) and in turn reflected in thigh and drumstick values also. More meat along with skin contributed to broiler aspects of Vigova ducks due to its fleshing properties. Neck meat yields with and without skin was in correlation with breast and leg meat, showing broiler characteristics. Muscle contribution and meatiness were more for the broiler strain of Vigova which might have resulted in higher mean value. The significantly higher ( $P<0.05$ ) values of yield and ratios of back and wings without skin for Kuttanad duck might be due to increase in age and thereby increase in bone contents. (Omojola, 2007).

**Table 2:** Various yields and ratios of different meat parts of Vigova and Kuttanad ducks based on slaughter weight

| Parameters<br>(%)                 | Based on slaughter weight |                    |
|-----------------------------------|---------------------------|--------------------|
|                                   | Kuttanad ducks            | Vigova ducks       |
| Breast meat yield (%)             | $11.72^a \pm 0.28$        | $11.95^a \pm 0.26$ |
| Breast meat and skin yield (%)    | $14.38^a \pm 0.29$        | $18.44^b \pm 0.27$ |
| Breast meat:bone ratio            | $3.49^a \pm 0.14$         | $3.44^a \pm 0.17$  |
| Breast meat and skin:bone ratio   | $4.27^a \pm 0.15$         | $5.30^b \pm 0.23$  |
| Back meat yield (%)               | $5.7^b \pm 0.13$          | $3.22^a \pm 0.11$  |
| Back meat and skin yield (%)      | $10.02^b \pm 0.30$        | $7.53^a \pm 0.14$  |
| Back meat:bone ratio              | $0.97^b \pm 0.02$         | $0.51^a \pm 0.01$  |
| Back meat and skin:bone ratio     | $1.70^b \pm 0.05$         | $1.20^a \pm 0.03$  |
| Leg meat yield (%)                | $7.00^a \pm 0.14$         | $9.35^b \pm 0.10$  |
| Leg meat and skin yield (%)       | $10.14^a \pm 0.20$        | $13.49^b \pm 0.13$ |
| Leg meat:bone ratio               | $3.20^a \pm 0.20$         | $4.16^b \pm 0.07$  |
| Leg meat and skin:bone ratio      | $4.65^a \pm 0.34$         | $6.00^b \pm 0.10$  |
| Thigh meat yield (%)              | $2.99^a \pm 0.05$         | $4.60^b \pm 0.11$  |
| Thigh meat and skin yield (%)     | $3.75^a \pm 0.06$         | $5.57^b \pm 0.14$  |
| Thigh meat:bone ratio             | $3.68^a \pm 0.15$         | $6.29^b \pm 0.27$  |
| Thigh meat and skin:bone ratio    | $4.62^a \pm 0.21$         | $7.60^b \pm 0.34$  |
| Drumstick meat yield (%)          | $4.01^a \pm 0.10$         | $4.75^b \pm 0.06$  |
| Drumstick meat and skin yield (%) | $6.38^a \pm 0.16$         | $7.93^b \pm 0.09$  |
| Drumstick meat:bone ratio         | $2.93^a \pm 0.25$         | $3.17^a \pm 0.09$  |

|                                   |                    |                    |
|-----------------------------------|--------------------|--------------------|
| Dumstick meat and skin:bone ratio | $4.70^a \pm 0.45$  | $5.29^a \pm 0.13$  |
| Wing meat yield (%)               | $3.34^b \pm 0.12$  | $2.60^a \pm 0.07$  |
| Wing meat and skin yield (%)      | $5.19^a \pm 0.12$  | $5.00^a \pm 0.13$  |
| Wing meat:bone ratio              | $0.79^b \pm 0.06$  | $0.64^a \pm 0.03$  |
| Wing meat and skin:bone ratio     | $1.23^a \pm 0.08$  | $1.23^a \pm 0.06$  |
| Neck meat yield (%)               | $1.86^a \pm 0.06$  | $2.26^b \pm 0.09$  |
| Neck meat and skin yield (%)      | $4.26^a \pm 0.13$  | $4.96^b \pm 0.16$  |
| Neck meat:bone ratio              | $0.87^a \pm 0.05$  | $0.87^a \pm 0.04$  |
| Neck meat and skin:bone ratio     | $1.98^a \pm 0.08$  | $1.91^a \pm 0.08$  |
| Meat yield (%)                    | $29.6 \pm 0.40^a$  | $29.38 \pm 0.28^a$ |
| Bone (%)                          | $18.04 \pm 0.29^a$ | $18.82 \pm 0.27^a$ |
| Skin (%)                          | $14.37 \pm 0.40^a$ | $19.96 \pm 0.23^b$ |
| Meat and skin (%)                 | $43.98 \pm 0.32^a$ | $49.34 \pm 0.30^b$ |
| Meat: bone ratio                  | $1.65 \pm 0.05^a$  | $1.57 \pm 0.03^a$  |
| Meat and skin: bone ratio         | $2.45 \pm 0.05^a$  | $2.63 \pm 0.04^b$  |

Mean  $\pm$  SE with different superscripts in the rows differ significantly ( $P<0.05$ )

**Table 3:** Various yields and ratios of different meat parts of Vigova and Kuttanad ducks based on carcass weight

| Parameters<br>(%)                  | Based on carcass weight |                    |
|------------------------------------|-------------------------|--------------------|
|                                    | Kuttanad ducks          | Vigova ducks       |
| Breast meat yield (%)              | $18.36^b \pm 0.47$      | $17.06^a \pm 0.37$ |
| Breast meat and skin yield (%)     | $22.53^a \pm 0.50$      | $26.32^b \pm 0.37$ |
| Breast meat:bone ratio             | $3.49^a \pm 0.14$       | $3.44^a \pm 0.17$  |
| Breast meat and skin:bone ratio    | $4.27^a \pm 0.15$       | $5.30^b \pm 0.23$  |
| Back meat yield (%)                | $8.90^b \pm 0.20$       | $4.56^a \pm 0.15$  |
| Back meat and skin yield (%)       | $15.69^b \pm 0.43$      | $10.76^a \pm 0.17$ |
| Back meat:bone ratio               | $0.97^b \pm 0.02$       | $0.51^a \pm 0.01$  |
| Back meat and skin:bone ratio      | $1.70^b \pm 0.05$       | $1.20^a \pm 0.03$  |
| Leg meat yield (%)                 | $10.98^a \pm 0.23$      | $13.35^b \pm 0.13$ |
| Leg meat and skin yield (%)        | $15.88^a \pm 0.30$      | $19.26^b \pm 0.18$ |
| Leg meat:bone ratio                | $3.20^a \pm 0.20$       | $4.16^b \pm 0.07$  |
| Leg meat and skin:bone ratio       | $4.65^a \pm 0.34$       | $6.00^b \pm 0.10$  |
| Thigh meat yield (%)               | $4.68^a \pm 0.09$       | $6.58^b \pm 0.15$  |
| Thigh meat and skin yield (%)      | $5.88^a \pm 0.09$       | $7.96^b \pm 0.20$  |
| Thigh meat:bone ratio              | $3.68^a \pm 0.15$       | $6.29^b \pm 0.27$  |
| Thigh meat and skin:bone ratio     | $4.62^a \pm 0.21$       | $7.60^b \pm 0.34$  |
| Drumstick meat yield (%)           | $6.29^a \pm 0.17$       | $6.77^b \pm 0.08$  |
| Drumstick meat and skin yield (%)  | $10.00^a \pm 0.25$      | $11.31^b \pm 0.12$ |
| Drumstick meat:bone ratio          | $2.93^a \pm 0.25$       | $3.17^a \pm 0.09$  |
| Drumstick meat and skin:bone ratio | $4.70^a \pm 0.45$       | $5.29^a \pm 0.13$  |
| Wing meat yield (%)                | $5.24^b \pm 0.20$       | $3.70^a \pm 0.10$  |
| Wing meat and skin yield (%)       | $8.13^b \pm 0.21$       | $7.12^a \pm 0.20$  |
| Wing meat:bone ratio               | $0.79^b \pm 0.06$       | $0.64^a \pm 0.03$  |
| Wing meat and skin:bone ratio      | $1.23^a \pm 0.08$       | $1.23^a \pm 0.06$  |
| Neck meat yield (%)                | $2.90^a \pm 0.09$       | $3.23^a \pm 0.14$  |
| Neck meat and skin yield (%)       | $6.65^a \pm 0.18$       | $7.07^a \pm 0.24$  |
| Neck meat:bone ratio               | $0.87^a \pm 0.05$       | $0.87^a \pm 0.04$  |
| Neck meat and skin:bone ratio      | $1.98^a \pm 0.08$       | $1.91^a \pm 0.08$  |
| Meat yield (%)                     | $46.35 \pm 0.70^b$      | $41.94 \pm 0.39^a$ |
| Bone (%)                           | $28.26 \pm 0.42^b$      | $26.86 \pm 0.37^a$ |
| Skin (%)                           | $22.49 \pm 0.54^a$      | $28.58 \pm 0.31^b$ |
| Meat and skin (%)                  | $68.84 \pm 0.46^a$      | $70.52 \pm 0.03^b$ |
| Meat: bone ratio                   | $1.65 \pm 0.05^a$       | $1.57 \pm 0.03^a$  |
| Meat and skin: bone ratio          | $2.45 \pm 0.05^a$       | $2.63 \pm 0.04^b$  |

Mean  $\pm$  SE with different superscripts in the rows differ significantly ( $P<0.05$ )

On carcass weight basis, Kuttanad ducks showed a significantly higher ( $P<0.05$ ) mean meat yield than Vigova ducks. The mean yields of skin, based on slaughter and carcass weights were significantly higher ( $P<0.05$ ) for Vigova ducks ( $19.96 \pm 0.23$  per cent and  $28.58 \pm 0.31$  per cent respectively) when compared to Kuttanad ducks ( $14.37 \pm 0.40$

per cent and  $22.49 \pm 0.54$  per cent respectively). Mean meat yield including the skin was significantly higher ( $P < 0.05$ ) for Vigova ducks and agreed with the findings of Bernacki *et al.* (2008) and Kokoszynski and Bernacki (2010).

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 Witkiewicz *et al.* (2004); Kleczek *et al.* (2007), Bernacki *et al.* (2008) and Kokoszynski and Bernacki (2010).

#### 4. Conclusion

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 and ratios of meat parts, except for back and wing 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.

#### 5. Future Scope

Further studies should be conducted to find out the profitable age of slaughter considering the meat yield at various ages.

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