

Effect of Age on Processing Yields and Losses of Kuttanad Ducks (*Anas platyrhynchos domesticus*)

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Abstract: An experiment was conducted in University Poultry and Duck Farm, Mannuthy, Kerala with the objective of comparing the processing yields and losses of Kuttanad ducks at three ages viz. eight, ten and twelve weeks of age and thereby to find the ideal age of slaughter in Kuttanad ducks. Twenty ducks each were utilized for the study. Preslaughter weight was significantly lower ($p<0.05$) at 8 weeks when compared with 10 and 12 weeks. The ready to cook yield or carcass weight was significantly higher ($p<0.05$) at 10 and 12 weeks of age. Total inedible offals percentage with respect to pre slaughter live weight was significantly higher ($p<0.05$) at 8 weeks of age. The percentage yield of breast meat was significantly higher ($p<0.05$) at 10 and 12 weeks of age and it is significantly lower ($p<0.05$) at 8 weeks of age. From the results, it can be concluded that Kuttanad ducks could be utilised for meat purpose at 10 weeks of age.

Keywords: Ducks, Dressing, Processing, Yields, Losses

1. Introduction

Meat is a very concentrated source of protein with high biological value containing almost all the amino acids, vitamins and minerals essential for human health. Poultry meat has high nutritional value and is a good source of protein. Duck meat is comparable to that of chicken and is a close alternative source of protein, minerals and other nutrients for humans. Kuttanad ducks, the most popular ducks of Kerala are hardy water fowls, suited to our climate and yield tasty and nutritious eggs and meat. Hence they need to be popularized in our country, especially in states like Kerala where water sources are plenty. Information on carcass characteristics of Kuttanad ducks would enable in popularizing this as a suitable source of meat to meet the increasing demand. This may also be helpful in the development of a concept of broiler ducks that is new to our State and to commercialize broiler duck farming. Therefore, the present study is envisaged to address the following objectives viz. to study the processing yields and losses of Kuttanad ducks at three ages and thereby to find the ideal age of slaughter in Kuttanad ducks.

2. Literature Survey

Ducks have a remarkably rapid growth during the first weeks of life. At slaughter age of 7 weeks in Pekin ducks, 10 to 12 weeks in Muscovy ducks and 10 weeks in Mulard ducks (crossbred of Muscovy drake and Pekin duck) they attain 70 to 80 % of adult weight, while chicken broilers have a slaughter weight less than 40 % of adult weight. There is a high increase of muscle percentage, especially of breast muscle and a slight decrease of carcass fat content due to decreasing skin proportion. The percentage of breast muscle increases more than the percentage of leg muscle decreases with advancing age. (Pingel, 1999) [5]

Chacko *et al.* (2009) reported that dressing per cent of cross bred male ducks reared under semi intensive management system was in the range of 57 to 78 per cent with an average dressing per cent of 64. The dressing per cent with giblets contributed to 71.81 per cent. [1]

Sapkota *et al.* (2009) conducted carcass trait studies on male and female *Chara-Chemballi* ducks of six months age and found that optimum slaughter weights were 1515 g and 1385 g respectively. Sapkota *et al.* reported dressing per cents of 64.54 and 60.89 for males and females respectively and observed that blood and feather constituted 4.02 per cent and 4.23 per cent respectively. Various inedible offals including head, feet and inedible viscera constituted 6.18 per cent, 3.06 per cent and 9.37 per cent respectively on slaughter weight basis. Male *Chara-Chemballi* ducks of six months age per cent of liver, heart, gizzard and giblet were 2.71 per cent, 0.93 per cent, 4.96 per cent and 8.43 per cent respectively. Cut up parts per cents of breast, back, wing, neck, thigh and drumstick of six month old male *Chara-Chemballi* ducks were 18.61, 17.31, 10.48, 5.34, 4.54 and 6.97 respectively on live weight basis. [6]

Harikrishnan *et al.* (2012) studied the carcass and organ characteristics of male Kuttanad ducks at eight weeks of age and reported a carcass weight of 937g and dressing percentage of 60.57 and 67.6 per cent, respectively, without and with giblets. [4]

George (2013) studied the carcass characteristics of Kuttanad ducks at 6 months of age and found that they showed a mean slaughter weight and carcass weight of 1467.54 ± 28.55 g and 937.92 ± 20.66 g respectively. Per cent mean yield of total inedible offals was 29.28 ± 0.19 and the mean yield of giblet was 5.94 ± 0.07 per cent. Among the cut up parts yield, breast showed the highest value. Mean yield values of breast on the basis of carcass weights was 28.14 ± 0.48 per cent respectively. [3]

3. Materials and Methods

An experiment was conducted in University Poultry and Duck Farm, Mannuthy with the objective of comparing the processing yields and losses of Kuttanad ducks (*Anas platyrhynchos domesticus*) at eight, ten and twelve weeks of age and to find out the ideal age of slaughter in Kuttanad ducks. All birds were reared under uniform conditions of management with *ad libitum* feed and water. They were reared under intensive system during the brooding period and then shifted to semi intensive system. All birds were fed with Broiler Starter feed containing 23 per cent Crude Protein.

Twenty birds each were selected for the study. The birds were fasted for 6 hours with access to *ad libitum* water. On the day of slaughter, slaughter weight of all ducks was recorded. Ducks were scientifically and hygienically slaughtered in poultry processing unit in the Department of Poultry Science. Bleeding was carried out for 2 min and the weight after bleeding was recorded. The birds were subsequently scalded by immersion scalding in hot water at 60°C for 2 min, defeathered in a defeathering machine, singed and washed. Weight of all birds was recorded after defeathering. 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 dressed carcasses were separated into different parts - legs, breast, back, wings and neck and weight of each cut was recorded.

The weights of ducks prior to slaughter were taken and expressed as pre-slaughter live weights. The weights of ducks after evisceration were taken and expressed as carcass weights or ready to cook yield. Carcass yield was assessed as per Forrest *et al.* (1975) [2]. Dressing percentage was also calculated with and without giblets. Carcass appearance after defeathering was scored as per Ahmad *et al.* (1996). Processing losses were calculated by weighing the inedible offals viz. blood, feathers, head, shank, trachea and lungs and gastrointestinal tract and other offals including kidneys, spleen, testicles/ovaries. Average yield of giblets and the yield of each of the cut up parts was also calculated. The data obtained were analysed statistically as per Snedecor and Cochran (1994) at five percent probability level [7].

4. Results and Discussion

The results of pre-slaughter weight and processing yields are presented in Table 1. Pre-slaughter weight was found to be 1126.75 ± 32.82 g, 1255.15 ± 26.73 g and 1267.80 ± 30.59 g, respectively, at 8, 10 and 12 weeks of age. Preslaughter weight was significantly lower ($p < 0.05$) at 8 weeks when compared with 10 and 12 weeks. The ready to cook yield or carcass weight was significantly higher ($p < 0.05$) at 10 and 12 weeks of age. Average dressing percentage (with giblet) was statistically similar at all the three ages whereas the average dressing percentage (without giblet) was significantly higher ($p < 0.05$) at 10 weeks. No abdominal fat was observed at 8 and 10 weeks of age, whereas the average

weight of abdominal fat (1.96 ± 0.43 g) was significantly higher at 12 weeks. Significant difference was observed in the yield of giblets and it is higher at 8 weeks of age. Percentage of liver and gizzard was also significantly higher ($p < 0.05$) at 8 weeks whereas no significant difference was noticed in the yield of heart. Average adult body weight of Kuttanad ducks is about 1500g and the body weight in relation to adult weight at 8, 10 and 12 weeks of age is 75.11, 83.68 and 84.52 percent, respectively.

Table 1: Processing yields of Kuttanad ducks at 8, 10 and 12 weeks of age

Sl. No.	Parameters	8 weeks	10 weeks	12 weeks
1	Pre slaughter weight (g)	$1126.75^b \pm 32.82$	$1255.15^a \pm 26.73$	$1267.80^a \pm 30.59$
2.	Carcass yield (g)	$696.02^b \pm 20.72$	$812.24^a \pm 18.88$	$802.09^a \pm 19.22$
3.	Dressing Percentage - without giblets (%)	$61.78^b \pm 0.43$	$64.71^a \pm 0.55$	$63.48^{ab} \pm 1.17$
4.	Dressing Percentage - with giblets (%)	$70.08^a \pm 0.43$	$72.28^a \pm 0.58$	$70.24^a \pm 1.26$
5.	Giblet yield (%)	$8.30^a \pm 0.13$	$7.57^b \pm 0.12$	$6.76^c \pm 0.15$
6.	Heart (%)	$0.73^a \pm 0.03$	$0.74^a \pm 0.02$	$0.78^a \pm 0.02$
7.	Liver (%)	$3.06^a \pm 0.07$	$2.77^b \pm 0.07$	$2.57^b \pm 0.08$
8.	Gizzard (%)	$4.17^a \pm 0.08$	$3.78^b \pm 0.08$	$3.40^c \pm 0.10$

Means bearing identical superscripts in the rows do not differ significantly ($p < 0.05$).

The processing losses of Kuttanad ducks at 8, 10 and 12 weeks of age is presented in Table 2. The percentage of blood was significantly higher ($p < 0.05$) at 8 weeks of age whereas no statistical difference was observed for feather percentage. Mean percentage of head and shank was significantly higher ($p < 0.05$) at 8 weeks when compared with 10 and 12 weeks. Significant difference was observed in the mean percentage of gastro intestinal tract and other inedible offals, higher at 8 weeks and lower at 12 weeks. Total inedible offals percentage with respect to pre slaughter live weight was significantly higher ($p < 0.05$) at 8 weeks of age.

Table 2: Processing losses of Kuttanad ducks at 8, 10 and 12 weeks of age

Sl. No.	Parameters (%)	8 weeks	10 weeks	12 weeks
1.	Blood	$7.74^a \pm 0.25$	$6.48^b \pm 0.36$	$6.93^{ab} \pm 1.90$
2.	Feather	$3.80^a \pm 0.35$	$4.13^a \pm 1.40$	$3.93^a \pm 1.50$
3.	Head	$7.16^a \pm 0.17$	$6.25^b \pm 0.16$	$6.20^b \pm 0.15$
4.	Shank	$3.23^a \pm 0.07$	$2.95^b \pm 0.09$	$2.88^b \pm 0.05$
5.	Trachea and lungs	$2.11^a \pm 0.11$	$1.81^{ab} \pm 0.08$	$1.77^b \pm 0.14$
6.	Gastrointestinal tract and others	$6.72^a \pm 0.12$	$5.95^b \pm 0.20$	$5.05^c \pm 0.16$
7.	Total inedible offals	$30.77^a \pm 0.55$	$27.57^b \pm 0.45$	$26.75^b \pm 0.57$

Means bearing identical superscripts in the rows do not differ significantly ($p < 0.05$).

The average yield of various cut up parts is given in Table 3. The percentage yield of wings, neck, back and breast was significantly higher ($p < 0.05$) at 8 weeks and was statistically similar at 10 and 12 weeks of age. But the percentage yield

of breast meat was significantly higher ($p < 0.05$) at 10 and 12 weeks of age and it is significantly lower ($p < 0.05$) at 8 weeks of age. At 8 weeks of age, the yield of back and leg was higher whereas, at 10 and 12 weeks of age, breast meat yield increased considerably when compared with other cut up parts.

Table 3: Yield of various cut up parts of Kuttanad ducks at 8, 10 and 12 weeks of age

Sl. No.	Part	8 weeks	10 weeks	12 weeks
1.	Wings	15.94 ^a ± 0.26	13.99 ^b ± 0.22	14.54 ^b ± 0.32
2.	Neck	13.99 ^a ± 1.36	12.99 ^b ± 1.51	12.83 ^b ± 1.64
3.	Back	26.94 ^a ± 0.44	23.69 ^b ± 0.65	23.35 ^b ± 0.48
4.	Breast	18.79 ^b ± 0.57	28.99 ^a ± 0.74	27.86 ^a ± 0.56
5.	Leg	23.19 ^a ± 0.51	19.35 ^b ± 0.36	19.42 ^b ± 0.25

Means bearing identical superscripts in the rows do not differ significantly ($p < 0.05$).

On perusal of literature it was found that studies have not yet conducted to find out the ideal age of slaughter in Kuttanad ducks. The pre-slaughter weights and carcass weights of Kuttanad ducks at 6 months of age reported by George (2013) and those of male Kuttanad ducks reported by Harikrishnan *et al.* (2012) was higher than those observed in the present study. Dressing percentage with giblet obtained in the present study was similar to that reported by George (2013), Sapkota (2009) and Chacko (2009) and was higher than those reported by Harikrishnan *et al.* (2012). Average weight at different ages in relation to adult weight and the trend in the yield of cut up parts is in agreement with Pingel (1999). Mean per cent of total inedible offals observed in the present study is similar to that reported by George (2013). Per cent yield of head, shank and feathers observed in the present study were higher than those of reported by Harikrishnan *et al.* (2012) in Kuttanad ducks at eight weeks of age. Yield of heart, liver and gizzard recorded in the present study was similar to that reported by Harikrishnan *et al.* (2012). Higher values were obtained in the present study for giblet yield, liver and gizzard yield whereas similar value was observed for heart per cent by George (2013). Regarding the yield of various cut-up parts, there was considerable improvement in the yield of breast portion as age advances in Kuttanad ducks as evident from the studies of George (2013).

5. Conclusion

In Kuttanad ducks, almost 70 to 80 per cent of growth is completed by 10 to 12 weeks of age and can be used for meat purpose. As age advances, there is substantial increase in the yield of breast meat whereas proportion of leg meat decreases with advancing age. Hence, it could be concluded that the ideal age for slaughter in Kuttanad ducks is ten weeks.

6. Future Scope

Further studies could be conducted to find out the economics of rearing Kuttanad ducks for meat purpose upto 8, 10 and 12 weeks and thereby to find out the profitable age of slaughter.

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