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Evaluation of carcass traits of Chara and Chemballi varieties of Kuttanad ducks at 52 weeks of age

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Abstract

As part of phenotypic characterisation of Chara and Chemballi varieties of Kuttanad ducks and to assess the carcass traits of spent ducks, twelve birds each from both variety were randomly selected, slaughtered humanely and the carcass characteristics were evaluated and compared. The mean dressing per cent with giblets in Chara and Chemballi males was 72.27 and 72.60, respectively and in females the values were 67.34 and 64.11, respectively. The mean per cent yield for neck, wing, breast, back and leg was 12.52, 13.81, 29.98, 22.12 and 19.31 in Chara males whereas the corresponding values were 13.40, 14.30, 28.47, 21.54 and 20.49, respectively in Chemballi males. In case of females the per cent yield of neck, wing, breast, back and leg was 12.75, 13.98, 28.74, 22.38 and 20.45 in Chara females whereas the corresponding values were 13.67, 13.87, 29.89, 21.49 and 19.32, respectively in Chemballi females. The mean values between the two varieties did not differ significantly for any of the traits measured.

Keywords: Carcass traits, Chara ducks, Chemballi ducks, dressing percentage

Introduction

India has a substantial duck population, next to chicken constituted mainly by indigenous or native duck breeds. In most of the Asian countries, duck are primarily maintained as layers and meat is available from the spent ducks as by product of layer industry. Optimizing the utilization of spent ducks, which are ducks that have reached the end of their productive cycle in terms of egg-laying or breeding, is essential for resource efficiency. The utilization of native duck breeds in India not only provides farmers with nutritional and economic security but also offers a sustainable and culturally relevant approach to duck farming. Duck meat is having unique organoleptic properties accounting for its huge demand next to chicken in many parts of the world, particularly in Asia (Ali *et al.*, 2007) ^[1]. Meat from ducks, especially breast meat, has a high nutritive value with a water content of 76.41 per cent, protein per cent of 20.06, ash of 0.92 per cent and fat content of 1.84 per cent (Ali *et al.*, 2007) ^[1]. Meat from spent ducks after the completion of production cycle is sold in the market at a lower price. Despite their many advantages duck meat is not commonly used for making value added products. Carcass study provides valuable insights and benefits for various stakeholders, including farmers, researchers, and the poultry industry as a whole and is of significant importance when it comes to spent ducks, which are typically ducks that have reached the end of their productive life. Duck breast meat are abundantly rich in quality amino acid profile with a higher content of leucine, lysine, tryptophan, phenylalanine, and tyrosine and by a higher proportion of polyunsaturated fatty acids, including linoleic and linoleic fatty acids, when compared with the breast meat of broiler chickens (Wołoszyn *et al.*, 2006) ^[2]. In China, India and south eastern Asia, duck eggs contribute 10 to 30% of all eggs consumed (Arthur, 2017) ^[3] and meat is sold out of the spent ducks at lower price. When looking for new products, consumers in recent decades have paid increasing attention to products obtained from native farm animals, including native ducks. The meat of native ducks is often characterized by unique qualitative properties and better sensory attributes (juiciness and tenderness, taste and aroma intensity, and desirability) compared with commercial hybrid ducks (Witkiewicz *et al.*, 2004, Kokoszynski, 2015) ^[4, 5], which encourages consumers to buy it. Understanding the carcass traits of spent ducks can lead to the development of new poultry products.

This diversification is crucial for meeting the diverse dietary preferences of the Indian population and catering to changing food habits. Kuttanad ducks comprising of Chara and Chemballi varieties are the native ducks of Kerala which is very popular as meat delicacy. The research on carcass traits of spent ducks in India is pivotal for various reasons, including economic, environmental, and public health considerations. By efficiently using the meat and other by-products of spent ducks, Indian farmers and the poultry industry can generate additional income. The information on carcass traits of Chara and Chemballi as spent ducks is feeble. In this backdrop, as a preliminary step this study was framed to assess the carcass traits of Chara and Chemballi varieties of Kuttanad ducks.

Materials and Methods

The trial was conducted in the Department of Poultry Science, College of Veterinary and Animal Sciences, Mannuthy, to evaluate and compare the carcass traits of Chara and Chemballi varieties of ducks at the end of 52 weeks of age. At the end of 52 weeks of age, twelve birds each from both Chara and Chemballi variety (6 Males and 6 Females Birds) were randomly selected for carrying out the slaughter study. The females were kept in cages system of rearing and males in semi intensive system of rearing. Identical feeding practices were followed for both the varieties. The birds were subjected to pre-slaughter starvation of eight hours before taking the slaughter weight. The birds were weighed and slaughtered humanely and hygienically to study the carcass characteristics as per standard procedures (Sams, 2001) [6] in the processing plant attached to the Department of Poultry Science. The various carcass traits assessed were slaughter weight, dressed weight, ready- to- cook yield, weight of abdominal fat, gilet and cut- up- parts. Based on slaughter weights in grams the dressing percentage and per cent of ready-to- cook yield (dressing percentage with giblets), abdominal fat and giblets were calculated. The per cent yield of cut- up- parts were calculated based upon carcass weight. Statistical analysis was carried out by performing independent t-Test using SPSS version 24.

Results and Discussion

The mean values for carcass traits of male and female Chara and Chemballi ducks are presented in Table 1 and Table 2, respectively. Except for mean live weight of males, there was no statistically significant difference in mean values between Chara and Chemballi for any of the carcass traits measured.

Dressing percentage

The mean dressing per cent without giblets was 67.92 and 68.47 in Chara and Chemballi males, respectively whereas the dressing percentage with giblets was 72.27 and 72.60, respectively. The dressing percentage without giblets was 61.05 and 58.03 in Chara and Chemballi females, respectively whereas the dressing percentage with giblets was 67.34 and 64.11 in Chara and Chemballi females, respectively. There

was no statistically significant difference between the two varieties in mean dressing per cent values.

The mean dressing percentage without giblets reported in Chara and Chemballi males was higher than that reported in crossbred males of 20 weeks of age (Chacko *et al.*, 2009) [7] but lower than Kuzi ducks of Odisha (Padhi *et al.*, 2022) [8]. The dressing percentage with giblets of Chara and Chemballi males were similar with the reports in crossbred males of 20 weeks of age (Chacko *et al.*, 2009) [7] and in adult ducks of Kashmir (Bihaqi *et al.*, 2013) [9] but slightly higher than the values reported in Kuttanad ducks of six months old (George, 2013) [10]. The mean values of dressing percentage without giblets in both Chara and Chemballi females were similar to the findings in desi spent ducks (Sangilimadan *et al.*, 2001) [11] but the mean value of dressing percentage with giblets of both Chara and Chemballi females were lower than the values of desi spent hen ducks by Sangilimadan *et al.* (2001) [11].

Yield of abdominal fat, giblets and cut-up-parts

The mean abdominal fat percentage was 1.54 and 1.23 in Chara and Chemballi males, respectively. The corresponding value for Chara and Chemballi females was 1.05 and 1.03, respectively. The mean gilet yield was 4.34 and 4.14 per cent in Chara and Chemballi males, respectively. The mean gilet per cent was 6.29 and 6.08 in Chara and Chemballi females, respectively.

The mean per cent yield for neck, wing, breast, back and leg was 12.52, 13.81, 29.98, 22.12 and 19.31 in Chara males whereas the corresponding values were 13.40, 14.30, 28.47, 21.54 and 20.49, respectively in Chemballi males. In case of females the per cent yield of neck, wing, breast, back and leg was 12.75, 13.98, 28.74, 22.38 and 20.45 in Chara females whereas the corresponding values were 13.67, 13.87, 29.89, 21.49 and 19.32, respectively in Chemballi females. There was no statistically significant difference between the varieties in the above parameters.

The difference in mean abdominal fat per cent values did not differ significantly between males and females of two varieties. The abdominal fat per cent increases with body weight. The abdominal fat percentage in female Chara and Chemballi ducks were slightly higher than that reported in Desi spent ducks (Sangilimadan *et al.*, 2001) [11]. The mean gilet percentage in female Chara and Chemballi ducks were 6.29 and 6.08 respectively. The difference in mean values gilet yield of males and females of Chara and Chemballi was not statistically significant. The mean values of females of both variety were similar to the findings of in indigenous ducks of Assam (Mahanta *et al.*, 2000) [12], adult local ducks of Kashmir (Bihaqi *et al.* 2013) [9] and in Kuttanad ducks by George (2013) [10].

All the mean values of yield of different cut- up-parts did not differ significantly between Chara and Chemballi. The results were similar to the findings of Bihaqi *et al.* (2013) [9] in Kashmir local ducks. The mean values for different cut up parts of the present study were similar to that in Kuttanad ducks (George, 2013) [10].

Table 1: Mean (\pm SE) values for carcass characteristics Chara and Chemballi males at 52nd weeks of age

Traits	Chara	Chemballi	P-Value
Live weight (g)	1721.00 \pm 35.38	1596.00 \pm 28.67	0.02*
Dressed weight (g)	1169.72 \pm 32.92	1093.12 \pm 27.23	0.103
Ready- to-cook yield (g)	1244.35 \pm 33.19	1159.05 \pm 27.45	0.076
Dressing % (without gilet)	67.92 \pm 0.73	68.47 \pm 0.82	0.632
Dressing % (With gilet)	72.27 \pm 0.69	72.60 \pm 0.79	0.758
Abdominal fat (%)	1.54 \pm 0.18	1.23 \pm 0.20	0.286

Giblet (%)	4.34±0.17	4.14±0.13	0.349
Neck (%)	12.52±0.52	13.40±0.60	0.294
Wing (%)	13.81±0.33	14.30±0.38	0.355
Breast (%)	29.98±0.69	28.47±0.78	0.178
Back (%)	22.12±0.79	21.54±0.36	0.518
Leg (%)	19.31±0.36	20.49±0.46	0.070

Non-significant ($p>0.05$); * significant ($p<0.05$)

Table 2: Mean (\pm SE) values for carcass characteristics of Chara and Chemballi females at 52nd weeks of age

Parameters	Chara	Chemballi	P-value
Live weight (g)	1702.33±52.29	1643.5±91.77	0.59
Dressed weight (g)	1040.65±45.5	955.58±68.77	0.327
Ready- to- cook yield (g)	1147.90±47.58	1055.17±72.61	0.311
Dressing% (without giblet)	61.05±1.36	58.03±2.09	0.254
Dressing % (with giblet)	67.34±1.10	64.11±2.09	0.202
Abdominal fat (%)	1.05±0.26	1.02±0.24	0.940
Giblet (%)	6.29±0.37	6.08±0.13	0.605
Neck (%)	12.75±0.67	13.67±1.42	0.569
Wing (%)	13.98±0.63	13.87±0.77	0.913
Breast (%)	28.74±0.82	29.89±0.87	0.358
Back (%)	22.38±0.99	21.49±1.06	0.556
Leg (%)	20.45±0.82	19.32±0.34	0.245

Non-significant ($p>0.05$)

Conclusion

Both Chara and Chemballi possess similar and satisfactory values for all the carcass traits measured. The information on carcass traits of Chara and Chemballi is very useful as limited information is available on spent ducks which will strengthen the published scientific data. Further research on value added and restructured meat products using spent duck meat of these two varieties should be carried out. Efficient utilization of spent ducks, can significantly contribute to restructuring the Indian poultry industry, improving the livelihoods of small-scale farmers and ensuring a consistent supply of quality meat and eggs to the public.

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