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Carcass Characteristics of Indigenous Geese Reared Under Backyard System

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A B S T R A C T

The present study was conducted to determine the slaughter and carcass traits of indigenous geese reared in backyard system in some of the districts of Assam. A total of 12 geese (6 male and 6 female) which were 18-20 months of age were utilized for the investigation. The mean weights (g) of slaughter, hot carcass, cold carcass, neck, wings, back, breast and drumstick were found to be 4182.50, 3266.50, 3150.00, 178.00, 321.50, 666.00, 696.50 and 359.50 respectively. The mean weight (g) of giblet, head, blood, shank and inedible parts were found to be 229, 147.50, 156.50, 112 and 378.50 respectively. In the current study the carcass yield (%) in male and female was 78.75 and 79.57 respectively and average yield was 78.16%. The average yield (%) of cut up parts *i.e*., neck, wings, back, breast and drumstick were 4.23, 7.65, 15.84, 16.63 and 8.63 respectively. The mean yield (%) of abdominal fat, giblet, blood and inedible parts were found to be 5.13, 5.49, 3.74 and 9.07 respectively. The average abdominal fat weight in females was more in the present study (276g as compared to 146g in males). The meat to bone ratio was approximately found to be 1:2. There was nil or negligible odour in the geese meat which may result in higher preference for the meat among the consumers.

Introduction

Nowadays, there is an increasing demand for food products obtained by organic production systems, especially for poultry and their products. It was well documented by Kirmizibayrak *et al*., (2011) that the meat quality of local poultry breeds produced under traditional conditions are highly valued by the consumers. In this context, it was observed that almost all the indigenous geese in Assam are maintained in free ranging scavenging

system and as close as possible to organic production conditions. The important characteristics of geese production include its ability to use high-fiber feeds, ease of rearing owing to zero input system and production of valuable by-products, like down feathers and fatty liver, which make it suitable for a sustainable agriculture arrangement. Among the various alternative poultry species, geese have interesting biological characteristics; such as a high juvenile growth rate, disease resistance and a high dietary meat quality as reported by Hamadani *et al.,* (2013). Geese rearing have been an ancient tradition in Europe and Asia and in recent years attention has been focused on the meat production of native geese breeds (Saatci *et al.,* 2009). Okruszek *et al.,* (2008) characterized these breeds of geese with good musculature and low carcass fatness, as well as high dressing percentage. In terms of the nutritional value of the meat, Buzała *et al.,* (2014) distinguished goose meat by low intramuscular fat content, relatively high levels of unsaturated fatty acids and low cholesterol. From consumer point of view, sensory attributes of meat are vital factors that determine preference for a product. From this perception, limited information exists about goose meat and in India, Hamadani *et al.,* (2013) compared Kashmir Anz geese meat with chicken meat and mutton. They reported that consumers highly favored goose meat in terms of appearance, texture, taste and overall acceptability. Okruszek (2013) also defined goose meat as a meat with specific traits like aroma and flavor, as compared to other poultry species. Furthermore, Geldenhuys *et al.,* (2014) conducted a study, which evaluated the sensory characteristics of Egyptian goose meat and observed that it had a strong game aroma and flavor and was low in tenderness and juiciness. However, relatively few studies have assessed the carcass and meat quality traits of geese reared in free ranging production systems. Geese rearing in Assam have been primarily carried out by families in traditional conditions, contributing to both home nutrition and family income. In this production model, geese are released outdoors and kept in shelters at night made with locally available items. As it is already noted, there are not many studies on dressing percentage and meat quality of geese carcass from indigenous genetic resources. Therefore, it seems to be essential to supplement research on these native geese which are reared in backyard conditions and highlight them as potential source for poultry market. Hence, the aim of the present study was to determine the slaughter traits and carcass yield of native geese from some of the districts of Assam.

Materials and Methods

The current study was carried out in some districts of Assam, where native geese are reared under free-range production conditions. Clinically healthy 18 to 20 months old twelve numbers of geese were procured from different local markets. According to the gender, six female and six male geese were investigated. The geese were reared in free range system until slaughter. They were not allowed to graze and did not receive additional feeding for 12 h before slaughtering, but water was continued to be supplied until slaughter. All the geese were numbered prior to slaughter and their slaughter weights were measured on a digital scale with a precision of 0.1 g. The geese were sacrificed and after blood flow ceased, birds were weighed again to calculate blood weight. Then carcasses were immersed in water at 60ºC for 5 min, after which the feathers were removed. The birds were scalded, defeathered and studied for carcass characteristics after singeing, washing and evisceration (Panda, 1998 and Sams, 2005). The weights of different organs were recorded with sensitive digital balance after cutting the organs as per the standard procedures (Jones, 1984 and Adams, 1990).

The head and shank were removed and weighed separately. The internal organs were removed and hot carcass, heart, liver, gizzard and intestine weights were measured. Additionally, carcass parts (leg, breast, back, wing, and neck) were assessed with skin. The whole carcass was weighed after removal of head and shank. The abdominal fat was gathered from the abdomen, gizzard and liver.

The carcass yield, head, feet, liver, heart, gizzard, intestines and abdominal fat relative weights are calculated as a percentage of live weight at slaughter. The dressing percentage was estimated as the ratio of carcass with neck to slaughter weight. The percentages of different yield of cut up parts like breast muscle and drumstick were calculated as the percentage of the slaughter weight.

Results and Discussion

The average slaughter and carcass characteristics of native geese have been presented according to gender of the bird in Table 1 along with various carcass yields tabulated in Table 2. The average slaughter weights of the birds were found to be 4182.50g, which were 4375g in males and 3990g in females. This value was found to be lower in Kashmir Anz geese, where the average value was 3071.88g as reported by Hamadani *et al.,* (2013). They also reported a lower average carcass weight of 1980.92g as compared to 3266.50g in the current study. The mean lesser slaughter and carcass weight may be attributed to the fact that birds were slaughtered at 12 months of age as compared to this study, where the birds were 18–20 months old. However, in another study by Kirmizibayrak and Kuru (2018), the overall average slaughter weight was 3760g, with average values of 3823g in males and 3753g in females. In a different study average slaughter weights of 3572g at 6-8 months of age and 3887g at 18-20 months of age, and of 3799g in males and 3649g in females were reported by Kirmizibayrak *et al.,* (2011). Hence, mean lesser weight of the indigenous geese of Assam may be associated with their feeding regime as followed in backyard system of rearing, which is characterized by scavenging system, natural hatching and poor productivity with negligible supplementary feeding, local marketing and no veterinary care. However, considering the above facts, the average carcass yield with skin in the present study was 78.16% (76.75% in males and 79.57 in females). The mean weight of most of the carcass traits and yield of parts was higher in males than female which could be explained with larger body size of the male goose. The slaughter and carcass weight statistical differences between male and female geese were put forward by Kirmizibayrak (2002), Tilki *et al.,* (2004), Tilki *et al.,* (2005), and Saatci *et al.,* (2009) which was carried out in the Kars region of Turkey. These differences were attributed to age at slaughter, genotype, and feeding practices. But in the current investigation mean weight of liver and abdominal fat was higher in females (79g and 276g in females as compared to 58g and 146g in males respectively). The gender differences in feet, heart, liver and gizzard weights were also reported by Kirmizibayrak and Kuru (2018); Sarıca *et al.,* (2015) on feet and heart weights; Kirmizibayrak *et al.,* (2011) on blood and gizzard weights and Tilki *et al.,* (2004) on feet, heart and liver weights, while comparing male and female geese carcass. However, Celik and Bozkurt (2009) didn't find any effect of gender on the abdominal fat weight unlike the current study. The meat to bone ratio was found to be approximately 1:2 (deboned meat was found to be 1648g and bone quantity was 807g). Similar to the findings of Hamadani *et al.,* (2013), nil or negligible odour was found in these native geese meat in the current investigation which might result in higher preference for the meat.

Table.1 The average slaughter and carcass traits of male and female indigenous geese under backyard system of rearing

Carcass Traits	Male (g)	Female (g)
Live or slaughter weight	4375	3990
Hot carcass weight	3358	3175
Blood	163	150
Head	152	143
Heart	33	28
Liver	58	79
Gizzard	132	128
Cold carcass weight	3236	3064
Neck	210	146
Wings	368	275
Back	774	558
Breast	753	640
Drumstick	343	376
Abdominal fat	146	276
Inedible part	379	378

Table.2 The average carcass yield (%) and yield of cut up parts (%) of male and female indigenous geese under backyard system of rearing

Yield characteristics	Male	Female
Carcass yield with skin (%)	76.75	79.57
Yield of cut up parts (%)		
Neck	4.80	3.66
Wings	8.41	6.89
Back	17.69	13.98
Breast	17.21	16.04
Drumstick	7.84	9.42
Abdominal fat	3.34	6.92
Giblet	5.10	5.89
Blood	3.73	3.76

It may be concluded that geese-farming promises to be a good future enterprise in areas where water bodies or paddy fields are available. The rearing can be carried out on a large scale adopting an extensive and free foraging feeding system. This can involve meager investment on feed and housing, which in return can provide supplementary source of income. However, the market demand and channel should be meticulously considered. There is no doubt that scientific studies on geese across the world are very scanty.

Hence, in the present study, various findings on slaughter and carcass traits of native geese reared under foraging system have been presented. The results obtained would

contribute in further research as well as various breeding activities for improvement of the indigenous germplasm.

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