

## STUDIES ON ASSESSMENT OF EMU CARCASS CHARACTERISTICS AND COMPOSITION OF LEAN MEAT

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### ABSTRACT

The study was conducted to evaluate the carcass characteristics of emu and proximate composition of lean emu meat. Three emu birds of 14 months of age were slaughtered by halal method. The mean live weight of emu birds was 31.79 kg. Dressing percentage of emu carcass was 67%. There was considerable amount of separable abdomen, back and breast fat present in emu carcass. Lean meat yield was 57%. Inedible and edible byproducts constituted 27.08 and 5.06% of live wt. of birds. The weight of leg was the highest followed by back and breast among all cut up parts. Highest meat bone ratio was recorded in leg cut. In contrast to broiler chicken, meat bone ratio was the lowest in breast cut. Emu meat had around 72% moisture, 22% protein content and very low fat content (1.74%). Emu meat had higher amount of fat in leg portion than back and breast meat.

**Key words:** Cut up parts, Emu carcass, proximate composition

Human beings need variety in their diet to suit the palate. Meat industry constantly invests in development of variety of meat products from different species of meat animals. Game and exotic meats are gaining more attention of consumers. Moreover, now a days consumer has become more health conscious therefore demand for designer meat products with low fat and cholesterol is constantly increasing. Due to the positive association between animal fats and certain diseases such as coronary heart disease, atherosclerosis and cancer (Simopoulos, 1991; Fernades and Venkatraman, 1993), acceptance of red meat in consumers is declining. Over the last many years, consumption of poultry meat has increased due to its healthier image (Anderson and Shagun, 1991). But consumers are still inclined towards red meat as it provides satiety and has been consumed since time immemorial.

More over demand for animal proteins is expected to increase by two third by 2050 (USDA, 1998). Increasing global requirements and changing consumer demand for healthier meat and meat products require exploration of alternative source of meat. Emu meat presents such a possibility (Tuckwell, 1993). The research on emu meat especially slaughtering and composition is limited as compared to meat of other species. Hence, the present study was carried out to determine the carcass characteristics of emu and composition of emu meat.

### MATERIALS AND METHODS

Three live emu male birds of around 14 months of age and weighing approximately 35 kg reared under similar

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management conditions were procured from an Emu farm in Hisar. They were slaughtered in the slaughter house of the Department by halal method. After slaughter, the dressed weight was computed and was separated into leg, back, breast and neck portions. Cut up parts were deboned and meat was stored at -18°C for further studies. Proximate composition of emu meat was determined by following the standard methods of AOAC (2005). Experiment was replicated three times for carcass characteristics and cut up parts and replicated six times for proximate composition.

### RESULTS AND DISCUSSION

**Carcass Characteristics of Emu:** The mean live weight of emu birds of 14 months of age was recorded as 31.79 kg (Table 1). It was within the live weight of birds of 14 months of age as indicated in previous studies. Frapple (1994) and Daniel (2000) recorded live weight of emu of 14 month of age as 30.6 kg and 35.1 kg, respectively. Dressing percentage of emu carcass was 67.85% including abdomen, back and breast fat. The results are in conformity with that of Naveena *et al.* (2013) who observed dressing percentage of emu carcass including fat, skin and neck to be 71.5%. Lean meat yield of emu carcass was 57% which included neck, whereas, lean meat yield of 34.5% was recorded by Sales *et al.* (1999).

In the present study, the emu birds yielded 10.85% separable abdomen, back and breast fat. According to Naveena *et al.* (2013), fat of emu birds was 27% of the live weight of birds. The difference might be due to variation in feeding and management practices. Also, there

**Table 1**  
**Characteristics and yield of emu carcass (Mean±SD, n=3)**

Component	Weight (kg)	Per cent of live weight
Live weight	31.79±1.90	-
Blood	1.20±0.14	3.77
Head	0.31±0.04	0.97
Skin and feathers	4.05±0.59	12.74
Intestine	1.55±0.36	4.87
Feet	1.23±0.03	3.87
Trachea and esophagus	0.27±0.06	0.85
Gizzard	0.69±0.09	2.17
Liver	0.64±0.10	2.01
Heart	0.28±0.01	0.88
Carcass	21.57±1.07	67.85
Dressing percentage	67.85±3.36	-
Separable abdomen, back and breast fat	3.45±2.05	10.85
Lean meat yield	18.12±1.51	57.00
Inedible by-products*	8.61±1.01	27.08
Edible by-products**	1.61±0.20	5.06

\*Includes blood, head, skin, feathers, intestine, feet, trachea and esophagus

\*\*Includes gizzard, liver and heart

is mobilization of fat in emu birds which is largely dependent on climatic conditions. Total inedible and edible by-products were 27.08 and 5.06%, respectively. The results are in accordance with that of Naveena *et al.* (2013) they also observed the inedible and edible by-products yields to be 25.63 and 3.59% of live weight, respectively. Yield of inedible by-products in emu is considerably lower than other red meat animal like cattle, buffalo, sheep and goat which account for almost 40% of inedible by-products (Ockerman and Basu, 2004).

**Cut up Parts of Emu Carcass:** Weight of leg of emu carcass was the highest i.e. 10.50 kg (Table 2). The yield of deboned emu meat from leg and thigh cut was the highest (74.31%). It also had the highest meat bone ratio (3.91:1) as compare to back (2.24:1) and breast (0.25:1). There was more muscular growth in leg and thigh area. Smith *et al.* (1993) documented that yield of lean meat

**Table 2**  
**Meat bone ratio of cut up parts of emu carcass (Mean±SD, n=3)**

Parts	Weight (kg)	Meat	Bone	Meat bone ratio
Leg	10.50 <sup>c</sup> ±0.88	8.36 <sup>c</sup> ±0.86	2.14 <sup>c</sup> ±0.16	3.91 : 1
Back	3.60 <sup>b</sup> ±0.27	2.49 <sup>b</sup> ±0.31	1.11 <sup>a</sup> ±0.09	2.24 : 1
Breast	2.00 <sup>a</sup> ±0.10	0.40 <sup>a</sup> ±0.04	1.60 <sup>b</sup> ±0.08	0.25 : 1
Neck	1.46 <sup>a</sup> ±0.10	-	-	-

Means with different lowercase superscript in a column differ significantly at P≤0.05

from leg portion of emu constituted 60% of total meat and the remaining 40% was distributed in other cuts. Jones and Robertson (1995) reported lean to bone ratio of 3.48 for culled emu of unknown history. Naveena *et al.* (2013) reported lean to bone ratio to be 3.04. In contrast to broiler chickens which yield quite high amount of meat from breast portion, emu breast yielded very low deboned meat.

**Proximate Composition:** Moisture content of lean meat obtained from whole emu carcass, leg, back and breast ranged between 72.39 to 72.98% (Table 3). Protein content ranged from 22.18 to 22.49% in lean meat of whole carcass and cut up parts. There was no significant difference in moisture and protein contents among cut up parts and whole carcass. The results are in accordance with that of Naveena *et al.* (2013) who also reported moisture and protein contents as 73.80 and 22.86%, respectively. Total fat content of lean emu carcass was 1.74%. Naveena *et al.* (2013) reported a fat content of 0.84% in emu meat. This variation in fat content could be attributed to the fact that fat content of muscle is the most variable character and influenced by type of diet and management practices. The fat content of breast was significantly (P≤0.05) lower than that of leg and back meat. This variable fat distribution could be attributable to the types of fibers present in leg and breast portions. Breast muscles contain much higher proportions of white fibers than leg muscles requiring less oxygen (Lesiak *et al.*, 1996), therefore, their energy needs for muscle contraction are more anaerobic than that of muscles containing more red fibers. Consequently myoglobin concentration is lower and this might be true for fat content as well (Hui *et al.*, 2001). Vecerek *et al.* (2005) also documented higher fat content in thigh muscles than breast muscles of pheasant poults. The ash content was found comparable amongst all.

The present study indicated that emu carcass contain higher amount meat, skin and feathers and inedible by-products. Highest meat bone ratio emu carcass was in leg cut. Emu meat contained a good source of protein and has very low fat.

**Table 3**  
**Proximate composition of lean emu meat (Mean±SD, n=6)**

Components	Leg	Back	Breast	Whole emu carcass
Moisture	72.71 <sup>a</sup> ±1.33	72.98 <sup>a</sup> ±1.52	72.39 <sup>a</sup> ±2.68	72.69 <sup>a</sup> ±1.84
Protein	22.18 <sup>a</sup> ±0.19	22.30 <sup>a</sup> ±0.43	22.49 <sup>a</sup> ±0.39	22.32 <sup>a</sup> ±1.77
Fat	2.34 <sup>c</sup> ±0.21	1.68 <sup>b</sup> ±0.28	1.21 <sup>a</sup> ±0.37	1.74 <sup>b</sup> ±0.37
Ash	1.59 <sup>a</sup> ±0.27	1.63 <sup>a</sup> ±0.25	1.70 <sup>a</sup> ±0.37	1.64 <sup>a</sup> ±0.38

Means with different lowercase superscript in a row differ significantly at P≤0.05

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