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## Studies on comparison of carcass composition of spent broiler breeders and commercial broilers

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### Abstract

The present study was aimed to evaluate the carcass characteristics of spent broiler breeders with commercial broilers. Cobb 430 spent broiler breeders (72 weeks) and broilers (6 weeks) were slaughtered in four trials comprising six birds each at a time. Spent broiler breeders showed significantly higher ( $P < 0.05$ ) pre-slaughter weight and dressed carcass weight than broilers. Dressing percentage was non-significantly ( $P < 0.05$ ) higher in breeders. Cut-up parts yield revealed that neck, wing and breast percent yields were found non-significant between broiler and breeders. Percent yield of back was found higher in broilers where thigh and drumsticks were found significantly ( $p < 0.05$ ) higher in breeders. Meat: Bone: Skin with fat ratios revealed that high valued cuts (breast and legs) showed significantly high proportions of meat than bone. Values for lower valued cuts revealed almost equal proportions of lean and meat. Lean and bone ratios of entire Carcass revealed that breeders were significantly ( $p < 0.05$ ) having higher proportions of lean than bone when compared to broilers. The study was concluded as there is a good scope for utilization of spent broiler breeder's meat for the preparation of different value added meat products where these birds are available at cheaper prices comparatively than broilers. Hence spent broiler breeder's meat can be successfully and economically used for the processing.

**Keywords:** Carcass characteristics, broiler, spent broiler breeder

### Introduction

India has 1.32 billion people by the year 2016 and the number is growing every year. India is a developing country, gradually focusing on good food, better health and fair living conditions. The affordability of Indians towards healthy diet is increasing day by day. In India poultry sector is highly organized sector when compared to any other agricultural sectors in India. Eggs and chicken are popular livestock foods accepted by all communities and available at affordable prices. Within a span of 25 years the egg production reached to 70 billion and poultry production reached to 3.8 million tonnes from nowhere. Now India stood at third place in egg production after china, USA and fourth position in chicken production after China, Brazil and USA. There is a significant growth in broiler industry in India being observed from the past 25 years. Broiler breeding stock housed has been increased from 0.7 to 3.5 crore and broiler per month is available from 5 to 25 crore from the past 25 years (APEDA, 2016) [1]. There is a tremendous growth in broiler sector has an impact on yield of spent broiler breeder stock. The Spent broiler breeder's (after the end of laying period) meat will be tougher compared to broilers because of their old age, attributes to collagen cross link formation in the muscle with aging. However Asian cousins includes spent bird's meat for the preparation of variety products like kebabs, tikkas, soups, curries, pickles etc. Hence the present study has been undertaken to compare the carcass characteristics of spent broiler breeders (72 weeks) and commercial broilers (6 weeks). Which was aimed to study various parameters including dressing percentage, edible and in-edible parts yield, cut-up parts yield and meat: bone: skin & fat ratio for different cut-up parts.

### Material and Methods

Cobb 430 female spent broiler breeders (72 weeks) and broilers (6 weeks) were procured from R R Foods and Feeds, Kothoor, Rangareddy. Spent breeder birds and broilers six each were slaughtered during each trial and total four trials were conducted. Birds were starved for six hours and slaughtered as per standard slaughter procedure. Inedible offal weight (blood, feather, head, shank and viscera), giblet weight [liver (without gall bladder), gizzard (without

mucous membrane) and the heart (after removal of blood clot and pericardium)] and cutup parts (neck, wings, back, breast, legs and drumsticks) weights were recorded. Carcass weight calculated based on eviscerated weight. Percentage yield of inedible and edible offal calculated based on pre-slaughter live weight and cutup parts yield was calculated based on eviscerated carcass weight. Dressing percentage calculated as the ratio between carcass weight and pre-slaughter live weight. Meat: bone: skin & fat ratio was calculated for each cut-up part separately.

**Statistical Analysis**

The data was subjected to statistical analysis by applying one way ANOVA (Analysis of Variance), Univariate analysis using Statistical Package for Social Sciences (SPSS) version 21. Differences between means were tested using Duncan’s multiple comparison test and significance was set at P<0.05.

**Results and Discussion**

Spent broiler breeders aged 72 weeks showed significantly higher (P<0.05) pre-slaughter weight and dressed carcass weight than broilers aged 6 weeks. Dressing percentage was non-significantly (P<0.05) higher in breeders, these results were corroborated with Kokoszynski *et al.* (2014) and Murawska and Bochno (2007) [5]. As increase in age there is a

gradual increase in dressing percentage, these results are in accordance with the findings of Muthukumar *et al.* (2011) [6] and Coban *et al.* (2014) [2]. Percentage yield of inedible offals including feather, head, feet were found significantly higher in broilers, where blood and entire viscera percent yields were non-significant between broilers and breeders. Percent yields of edible offals found non-significant (P<0.05) between groups while percent yield of gizzard found significantly higher in broilers (Table 1).

Cut-up parts yield (Table 2) revealed that neck, wing and breast percent yields were found non-significant between broiler and breeders. Percent yield of back was found higher in broilers where thigh and drumsticks were found significantly (p<0.05) higher in breeders. These findings are in accordance with Kokoszynski *et al.* (2014), Coban *et al.* (2014) [2] and Karaoglu *et al.* (2014) [3].

Meat: Bone: Skin with fat ratios (Table 3) revealed that high valued cuts (breast and legs) showed significantly high proportions of meat than bone. Values for lower valued cuts revealed almost equal proportions of lean and meat. Lean and bone ratios of entire Carcass revealed that breeders were significantly (p<0.05) having higher proportions of lean than bone when compared to broilers. These findings are in accordance with Preston and William (1973) [7].

**Table 1:** Pre-slaughter weight, Carcass weight, Dressing percentage and percent yield\* of edible & in-edible offals of Broiler (6 weeks) and Spent Broiler Breeder (72 weeks).

Parameter	Broiler	Spent broiler breeder
Pre-slaughter weight (g)	2536.083±117.6	4120.2±158.5*
Dressed Carcass weight (g)	1878.6±97.6	3140.983±159.78*
Dressing percentage	73.98±0.49	76.04±1.19
Blood yield	2.30±0.07	2.17±0.13
Feather yield	5.7±0.34	3.9±0.26*
Head yield	2.54±0.08	2.19±0.10*
Feet yield	5.28±0.27	3.23±0.09*
Entire Viscera yield	7.06±0.37	8.38±0.62
Liver yield	1.65±0.04	1.66±0.13
Gizzard yield	1.54±0.06	1.00±0.05*
Heart yield	0.39±0.02	0.34±0.01
Giblet yield	7.06±0.37	8.38±0.62

\*Yield of parts as percentage of pre-slaughter weight. Values are Mean ± SE; (n=6). Means with different superscripts in a row differ significantly (p<0.05).

**Table 2:** Percent yield\* of different cut-up parts of Broiler (6weeks) and Spent Broiler Breeder (72 weeks)

Cut-up part	Broiler	Spent broiler breeder
Neck	6.70±0.28	6.91±0.28
Wing	10.90±0.28	10.70±0.53
Breast	33.89±0.51	31.29±0.72
Back	19.05±0.53	17.13±0.49*
Thigh	15.83±0.28	17.32±0.47*
Drumstick	13.78±0.23	16.61±0.33*

\*Yield of parts as percentage of dressed carcass weight. Values are Mean ± SE; (n=6). Means with different superscripts in a row differ significantly (p<0.05).

**Table 3:** Meat: Bone: Skin with subcutaneous fat ratios of Broiler (6weeks) and Spent Broiler Breeder (72 weeks)

	Broiler	Spent Broiler Breeder
Neck	1 : 1.10 : 1.61	1 : 1.11 : 1.43*
Breast	8.96: 1.46: 1	8.94: 1.34*: 1
Back	3.17 : 3.58 : 1	4.64* : 4.36* : 1
Wings	2.70 : 2.65 : 1	2.66 : 2.04* : 1
Legs	6.67: 1.86: 1	10.02*: 1.46*: 1
Carcass	4.68 : 1.94 : 1	6.66* : 2.04 : 1

Values are Mean ± SE; (n=6). Means with different superscripts in a row differ significantly with respective portions between groups (p<0.05).

## Conclusion

The present study revealed that the spent broiler breeders having superior carcass yields compared to broilers. Lean yields of high valued primal cuts were found significantly ( $p < 0.05$ ) higher in spent broiler breeders which is helpful for making bone less cuts. The study was concluded as there is a good scope for utilization of spent broiler breeder's meat for the preparation of different value added meat products where these birds are available for cheaper prices comparatively than broilers. Hence spent broiler breeder's meat can be successfully and economically used for the processing.

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