

**Veterinary College and Research Institute, Namakkal**  
**Department of Livestock Products Technology (Meat Science)**  
**Comparison of meat quality and nutrient composition of commercial native chicken,**  
**backyard native chicken, commercial broiler and spent layer chicken**

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**M.V.Sc. Thesis Abstract :**

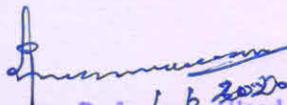
Chicken meat is more preferred because it is lower in price, easy to process, fast growing with short rising time and easy availability in the local market. Chicken meat has relatively low fat and cholesterol and is recognized as healthier food compared to red meat. Chicken meat is obtained from indigenous chicken, broiler and spent hen.

A study on carcass characteristics, meat quality traits and nutrient composition of commercial native chicken, backyard native chicken, commercial broiler and spent layer chicken was undertaken at the Department of Livestock Products Technology (Meat Science), Veterinary College and Research Institute, Namakkal - 637002.

Total 48 birds, 12 birds in each group (6 males and 6 females) of commercial native chicken (CNC) (6 months of age), backyard native chicken (BNC) (5 ½ months of age), commercial broiler (CB) (38 days old) and spent layer chicken (SLC) (71 weeks for male birds and 80 weeks for female) were purchased from the local market and local poultry farms. Meat yield, meat quality, physico-chemical parameters, nutritional composition and protein quality of each group were studied for breast and leg meat separately. Protein quality (biological value, true digestibility and net protein utility) of meat was studied by precision feeding trial in adult cockerels.

Based on the results of the present study significantly higher dressing percentage (without skin) and meat: bone ratio, was observed in CNC, BNC, and CB than SLC. Meat Bone ratio in CB was significantly higher ( $P < 0.01$ ) than BNC. Dressing % and meat bone ratio was significantly higher in males than females. Edible offal yield was significantly higher in BNC than other categories. Over all values for edible offal were significantly higher ( $P < 0.01$ ) in female than male. Inedible offal weight was significantly higher in CNC and also in males as compared to females. Per cent yield of inedible offal was significantly lower in CB than other categories. Values were significantly higher ( $P < 0.01$ ) in males than females.

pH of CB meat was significantly higher ( $P < 0.01$ ) than other three categories. Overall effect on sex and region males and thigh region had significantly higher ( $P < 0.01$ ) value. WHC

  
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values in CB and CNC were significantly higher than BNC and SLC. Over all values for WHC were significantly more in thigh muscle than breast muscle. There was no significant difference in ERV values of CNC, BNC, CB and SLC. Over all ERV values were significantly higher ( $P < 0.01$ ) in thigh meat than breast meat, however the value were non-significant in males and females. Muscle fiber diameter was significantly higher ( $P < 0.01$ ) in SLC and overall values were significantly higher in breast muscle than thigh muscle. Sarcomere length was significantly higher in CB and over all values was significantly higher in breast muscle than thigh. Total collagen content was significantly lower in CB and over all values were significantly higher ( $P < 0.01$ ) in thigh muscle.

There was no difference in the R value amongst all the categories. However the overall values were higher in males than female. Shear force values for fresh and cooked meat were significantly lower in CB and highest in SLC. Overall values were more in male than female. Between the muscles thigh muscle showed significantly higher ( $P < 0.01$ ) value than breast muscle and the trend reversed after cooking and shear force value for thigh muscle was significantly lower than breast muscle. The odour score in all the categories was expressed as flat odour which improved to moderately meaty after cooking. Colour of SLC meat was pink to light red which changed to white (breast muscle) to pale brown (thigh muscle). Effect of sex on the colour was not evident.

Protein content was significantly lower in CB than CNC, BNC and SLC. Over all protein content was significantly higher ( $P < 0.01$ ) in breast meat than thigh meat. Fat content was significantly higher ( $P < 0.01$ ) in CB than CNC, BNC and SLC. Over all fat content was significantly higher in thigh meat than breast meat. Ash content was significantly higher ( $P < 0.01$ ) in CB than CNC, BNC and SLC. Over all ash content was significantly higher in breast meat than thigh meat. Calcium and phosphorous content were significantly higher ( $P < 0.01$ ) in CB, iron and copper content were significantly higher in BNC. Amongst the muscle phosphorous content was significantly higher in breast meat and copper content was significantly higher in thigh meat. Cholesterol content was significantly lower in CB and CNC. Over all values for females were higher than males and thigh muscle had significantly higher ( $P < 0.01$ ) cholesterol content than breast muscle. Lipid content was significantly lower in BNC than other categories. Overall the lipid content of females was significantly higher ( $P < 0.01$ ) than males and thigh muscle was higher than breast muscle. Saturated fatty acid content was significantly lower and poly unsaturated fatty acid content was significantly higher ( $P < 0.01$ ) in CB than other categories. Amongst the muscles saturated fatty acid content was significantly higher in breast

  
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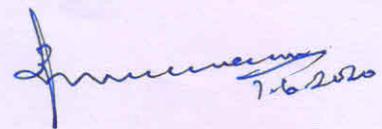
than thigh. Per cent content of essential amino acid content was significantly higher in CB and BNC than CNC and SLC and the same was significantly higher in breast meat than thigh.

The true digestibility, biological value and net protein utility in SLC were significantly lower than other categories. Biological value and net protein utility was significantly higher ( $P < 0.01$ ) in CB than CNC, BNC and SLC.

The antibiotic residues were below LOD / LOQ values (limit of detection / quantification)

For the meat product nuggets were prepared, the overall acceptability sensory score for CB were significantly higher ( $P < 0.01$ ) than CNC, BNC and SLC. Significant flavour difference was not noticed amongst CB and BNC. Sensory scores for the claw and shank soup prepared also did not show significant difference in the overall acceptability scores and the SLC recorded significantly lowest score.

The study revealed that commercial broiler meat was better than commercial native chicken, backyard native chicken and spent layer chicken in overall meat quality in terms of dressing percentage, meat yield, low collagen and cholesterol content, better tenderness, water holding capacity and juiciness. The collagen, lipid and cholesterol content were significantly higher in thigh than breast meat. The chewability in the cooked thigh meat was better than breast meat. The consumer perception of the unique flavour, taste and texture of backyard native chicken for which premium price is paid could not be justified. The higher biological value at affordable cost of broiler meat established its supremacy over other meat and hence it can be suggested to the consumer to enjoy the benefits of broiler meat for high quality proteins.



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