

ORGANOLEPTIC PROPERTIES OF SAUSAGES PREPARED FROM PRE AND POST RIGOR BROILER CHICKEN MEAT

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Abstract

Freshness of meat is an important consideration to consumers though it may attract higher price. However, fresh meat pre-rigor is not as tender as that of post-rigor meat which is one of the ultimate qualities that the consumers are looking for in meat. This study examined the quality characteristics and processing yield of pre and post rigor broiler chicken meat.

A total of sixty (60) four weeks old broiler birds were randomly allotted into 2 treatments, 3 replicates per treatment and 10 birds per replicate. The broilers were fed with broiler diet and fresh water ad libitum for 6 weeks. They were managed in a deep litter system with wood shavings as bedding. The organoleptic properties of the sausages prepared from these pre and post rigor broiler chicken meat were determined. Data obtained were subjected to T-test and the mean values showing significant ($P < 0.05$) differences were separated using Duncan's Multiple Range Test. Pre rigor poultry chicken meat is recommended for consumption. Fast food restaurants producing sausages should be encouraged to use pre rigor broiler chicken meat as formulation ingredient.

Keywords: Pre-rigor, Post-rigor, sausages, organoleptic properties.

Introduction

Poultry make a significant contribution to human nutrition and economic substances. They provide substantial amount of high quality protein in form of meat and table eggs. According to Okorie (1983) and Oluyemi and Roberts (1998), poultry yield the quickest returns of investment compared to other livestock species. Meat is an animal flesh that is used as food. Most often, this means the skeletal muscle and associated fat and other tissues, but it may also describe other edible tissues such as organs and offal.

Meat is a very complex product that can be affected by ante-mortem and post-mortem factors. Components of the muscle itself, like contractile proteins and connective tissue affect the characteristics of the final product whether it is a steak or a hot dog. Rigor mortis is the stiffening of the muscle after death, and is due to the formation of permanent cross bridge in the muscle between the actin and myosin filaments. During the periods immediately after exsanguination, muscle is quite extensible. In the living animal, aerobic metabolism is used to obtain energy. However, under stressful conditions blood is transported to the liver, where it is re-synthesized into glucose and glycogen, or to the heart where it is metabolized to carbon dioxide and water. Sausages are products in which fresh comminuted meats are modified by various processing

methods to yield desirable organoleptic and keeping properties. Sausages are one of the oldest forms of meat processing and modern sausage technology has its roots deeply embedded in history.

Materials and Methods

Experimental site

The study was carried out at the poultry unit of the Teaching and Research Farm and the Meat Science Laboratory, University of Ibadan.

Experimental Birds and Management

There were 2 treatments, 3 replicates per treatment and 10 birds per replicate. At the end of 10 weeks, 2 broilers per replicate were selected and were starved for 12 hours in order to have an almost empty stomach so as to avoid faecal contamination during evisceration. The organoleptic properties was conducted using a total of 10 trained individuals to assess the prepared sausage samples. The samples were evaluated for aroma, flavour, colour, juiciness, tenderness, and overall acceptability on a nine point hedonic scale according to Mahendraker *et al.* (1988) product yield was determined as well. Data obtained were subjected to T-test and the mean values showing significant ($P < 0.05$) differences were separated using Duncan's Multiple Range Test (Duncan, 1995).

Table1: Composition (%) of broiler diet

Ingredients	Composition (kg)
Maize	58.00
Soy bean meal	37.00
Soya bean oil	2.00
Di calcium phosphate	0.80
Limestone	1.50
Broiler premix	0.20
Lysine	0.10
Methionine	0.20
Salt	0.20
Total	100.00

Calculated analysis:

Crude protein = 21.44%

Ash = 2.97%

Fibre = 3.98%

Metabolisable energy = 3938kcal/kg

Table 2: Composition (%) of chicken sausage:

Ingredients	%	%
Chicken Meat (pre-rigor)	55.50	-
Chicken Meat (post-rigor)	-	55.50
Chicken skin	7.00	7.00
Abdominal fat	2.50	2.50
Wheat flour	20.00	20.00
Seasoning	1.85	1.85
Water	13.15	13.15
Total	100.00	100.00

Results and discussion

Product yield and organoleptic properties of sausages prepared from pre and post rigor broiler chicken meat.

Table 3 shows the results of product yield and organoleptic properties of sausages prepared from pre and post rigor broiler chicken meat. The product yield of both male and female in pre and post rigor state were not statistically different ($P >$

0.05). The organoleptic properties were not significantly different ($P > 0.05$) in pre and post rigor meat of both sexes with the exception of the flavor and tenderness. Aroma of male post rigor meat was 4.29. The highest value for colour was recorded in male pre rigor meat with the value of 5.70 and female post rigor recorded 4.63 as the lowest value for overall acceptability

Table 3: Product yield and Organoleptic properties of sausages prepared from pre and post rigor broiler meat

Parameters	PRE RIGOR MEAT		POST RIGOR MEAT	
	Male	Female	Male	Female
Product yield (%)	88.23± 1.53	89.83± 1.16	87.90± 0.66	89.20± 0.31
Aroma	4.26± 0.35	3.96± 0.16	4.29± 0.19	3.44± 0.34
Colour	5.70±0.23	5.11±0.57	5.30±0.30	4.63±0.13
Flavour	5.44±0.06 ^a	4.11±0.06 ^b	4.96±0.26 ^a	5.18±0.44 ^a
Tenderness	6.04±0.10 ^a	5.96±0.39 ^a	5.96±0.22 ^a	4.89±0.45 ^b
Juiciness	5.11±0.36	4.70±0.14	5.26±0.29	4.85±0.10
Acceptability	4.67±0.23	5.00±0.23	5.15±0.43	4.63±0.32

a,b Means in the same row with different superscripts differ significantly ($p < 0.05$)

Female pre rigor meat had the highest product yield value of 89.83 followed by female post rigor meat probably because of other ingredients that were added during the preparation. The sensory evaluation scores showed that most of the parameters were not significantly different ($p>0.05$). The higher colour was recorded in male pre rigor meat sausage. Swan (1993) revealed that colour intensity depends on the way the incident light is absorbed or scattered and this is influenced by pH. Male post rigor meat sausage also had the highest juiciness score, the juiciness rating increased with post mortem meat transformation (Omojola *et al.*, 2003). Male pre rigor meat sausage was tenderer, tenderness is known to be the most important sensory attributes that affect meat acceptability (Quali, 1990). The highest flavor attribute was also recorded in male pre rigor sausage although the value was not significantly different from male and female post rigor meat sausages. Meat flavor has taste and aroma as components (Warris, 2000). Male post rigor meat sausage had the highest aroma value as well as the overall acceptability. This evaluation showed that post rigor meat samples recorded the highest values for aroma and juiciness although most of the parameters taken were not significantly different.

Conclusion

The product yield of sausages made from female pre rigor meat was superior to others. Sausages made from male pre rigor meat were tenderer and had the highest flavor.

Recommendation

Pre rigor poultry chicken meat is recommended for consumption. Fast food restaurants producing sausages should be encouraged to use pre rigor broiler chicken meat as formulation ingredient.

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