

Sensory Evaluation of Chicken Sausage as Influenced by Levels of Inclusion of African Basil (*Ocimum gratissimum*) Leaf Powder

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ABSTRACT

This study investigated the effect of levels of inclusion African Basil leaf powder (ABLP) on sensory quality of chicken sausage. Two kilograms (2 kg) of chicken sausage per batch was prepared from deboned broiler meat. Conventional seasoning used in sausage production was replaced with ABLP at different levels (0%, 25%, 50%, and 75%). Data obtained on sensory evaluation was subjected to a one-way analysis of variance. The color of chicken sausage prepared with 0% ABLP was judged the best (7.27). Tenderness (5.20), juiciness (5.40), flavor (6.60), and acceptability (6.80) were higher ($p < 0.05$) in chicken sausage samples with 0% ABLP.

(Keywords: African basil leaf powder, ABLP, seasoning, chicken sausage, food science)

INTRODUCTION

Chicken meat is widely regarded as a healthy meat. Chicken meat does not contain the trans-fats that contribute to coronary heart disease while trans fats can be found in high amounts in beef and lamb. A comparison of chicken meat with other meats indicates that it is a healthy meat (David, 2010). Chicken meat like other livestock meat, can be further processed to other product such as sausages, burgers, patties, kebabs, etc.

Sausages are the largest group of meat products. The production of sausages dates back to ancient times (Kuzelov et al., 2013). The flavor of a particular sausage is strongly dependent on the seasonings added (Whiting and Miller, 1991). Spices and herbs have been added to food since ancient times not only as flavoring agents, but also as folk medicine and food preservatives (Nakatani, 1994). Advances

in product development have led to the use of various herbs and spice extracts to enhance flavor or as flavorings in sausage manufacture (Essien, 2003).

African basil (*Ocimum gratissimum*) has a number of uses in the meat processing industry. It imparts a pleasant taste and aroma. More importantly, its antimicrobial properties made it an ideal choice to supplement or replace such additives as preservatives and antibiotics in the meat processing industry. The aim of this present study was to assess the organoleptic properties of chicken sausage containing African Basil leaf powder. This stems from the limitation associated with the consumption of chemical additives in sausages as it relates to human health.

MATERIALS AND METHODS

This experiment was carried out at the Meat Processing Laboratory, Department of Animal Production and Health, Federal University of Agriculture, Abeokuta. Materials used were: chicken meat, giblets, wheat flour, seasonings, African basil leaf powder (ABLP), water and cellulose casings.

Preparation of African Basil Leaf Powder

The fresh leaves of the African basil were collected from Abeokuta Metropolis. The leaves were rinsed with water and air dried for 5 days. They were ground into fine powder using an electric blender and stored in an air tight container until use. It was used to replace traditional seasonings at 0, 25, 50, and 75% levels, respectively.

Preparation of Chicken Sausage

The chicken meat from the broilers was divided into four treatments with each treatment weighing 2kg. The measured and prepared chicken meat and giblets were run separately through a 5-mm plate in a Kenwood (Hampshire, UK) mincing machine. African basil leaf powder was added to replace seasoning at different levels 0, 25, 50, and 75% levels, respectively. Water and flour were added. The compositions of sausage recipe are presented in Table 1.

Sensory Evaluation

Organoleptic evaluation of cooked samples was carried out by 10 panelists. The parameters considered were color, flavor, juiciness, tenderness, and overall acceptability. Bite size portion of three replicates in each treatment were served at room temperature to panelists who were asked to comment freely on each sample served. Panelists were isolated from each other in order to prevent communication.

Each panelist was asked to rinse his or her mouth between samples to avoid any carry-over effect. The panelists scored each sample on a nine-point hedonic scale, where the extremes corresponded to 9 = liked extremely, 8 = liked

very much, 7 = liked moderately, 6 = liked slightly, 5 = neither liked nor disliked, 4 = disliked slightly, 3 = disliked moderately, 2 = disliked much, and 1 = disliked extremely (Sanwo *et al.*, 2013)

Data obtained were subjected to a completely randomized design in a one-way analysis of variance (ANOVA). Data Means were compared using Tukey's Studentized Range (HSD) Test of the same statistical package.

RESULTS AND DISCUSSION

Effect of Replacement Levels of African Basil Leaf Powder on the Sensory Qualities of Chicken Sausages

Table 2 shows the effect of replacement levels of ABLP on the sensory quality of chicken sausages. Significant ($p < 0.05$) differences were found in color, tenderness, flavor, juiciness and overall acceptability. The color of chicken sausage with 0% level of ABLP was judged the best (7.27). Tenderness, juiciness, flavor, and acceptability scores (5.20, 5.40, 6.60 and 6.80 respectively) were higher ($p < 0.05$) in chicken sausage samples with 0% level of ABLP.

Table 1: Composition (%) of Chicken Sausage.

Ingredients	Replacement levels of ABLP			
	0%	25%	50%	75%
Chicken meat	55.00	55.00	55.00	55.00
*Giblets	10.00	10.00	10.00	10.00
Wheat flour	20.00	20.00	20.00	20.00
**Seasoning	3.00	2.25	1.50	0.75
ABLP	-	0.75	1.50	2.25
Water	12.00	12.00	12.00	12.00
Total	100.00	100.00	100.00	100.00

*contains: Heart, Liver, Gizzard

**Contains: Salt- 200g, Pepper-115g, Nutmeg-40g, Mace-40g, Coriander-70g, Monosodium glutamate-3.5g

ABLP = African Basil Leaf Powder

Table 2: Effect of Replacement Levels of ABLP on the Sensory Qualities of Chicken Sausages.

Parameters	Replacement levels of ABLP				SEM	P VALUE
	0	25	50	75		
Color	7.27 ^a	6.20 ^b	4.80 ^c	3.70 ^d	0.42	0.0001
Tenderness	5.20 ^a	4.77 ^{ab}	4.60 ^b	4.20 ^b	0.12	0.0036
Flavor	6.60 ^a	5.50 ^b	4.90 ^c	4.40 ^c	0.25	0.0001
Juiciness	5.40 ^a	4.70 ^b	3.70 ^c	4.00 ^c	0.20	0.0001
Acceptability	6.80 ^a	5.80 ^b	5.10 ^c	3.70 ^d	0.02	0.0024

^{a, b, c} : Means in the same row with different superscripts are significantly ($p < 0.05$) different

SEM: Standard Error of Mean

ABLP: African Basil Leaf Powder

Results of Sensory properties of the chicken sausage as presented in Table 2 showed that color was scored low across the treatments with varying levels of ABLP, this could be attributed to the greenish color of the sausage. The greenish color of ABLP masked the color of the sausage giving it the dull color.

Choi *et al.* (2009) reported similar observations in chicken sausage prepared with varying levels of rice bran. The appearance of food is one of the major determinants of its appeal to consumers.

Juiciness is related to the degree of lubrication of the food during chewing and the subsequent swallowing. Juiciness of meat products arise from moisture that is released by the product during chewing and the moisture that comes from saliva (Winger and Hagyard, 1994).

Tenderness and juiciness were scored high in the sausage sample with 0% replacement level of ABLP, this could be related to the higher WHC and lower cooking loss of control treatment than the ABLP treated samples. Omojola (2007) observed that the lower the cooking loss of meat, the juicier the meat. Therefore, low cooking loss can be attributed to juiciness of the meat product.

The panelists highly rated the sausage sample with 0% replacement level of ABLP in terms of flavor and overall acceptability. This is expected since the sample had the least cooking loss which implies that much of the sausage nutrients were retained thereby enhancing sensory acceptability. Reduction in fat can significantly affect the acceptability of a product and increase the toughness of meat product (Giese, 1996).

CONCLUSION

From the results obtained, it could be concluded that chicken sausage with replacement level up to 50% of African Basil Leaf Powder adequate in sensory properties, but 0% replacement levels were preferred in all evaluated categories.

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