

SENSORY CHARACTERISTICS OF MEAT CHICKENS OBTAINED FROM BROILERS FED MANNAN OLIGOSACCHARIDES, GINGER AND GARLIC SUPPLEMENTED WITH ENZYMES

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ABSTRACT

This study was conducted to investigate the sensory characteristics of muscle obtained from broiler breast meat fed Mannan oligosaccharides (MOS), ginger and garlic supplemented with ROVABIO enzymes. One hundred and twenty (120) broiler birds were assigned to four treatment groups of ten birds per replicate of three replicates per treatment. In treatment 1, the birds were fed control diets with ROVABIO enzymes only, while treatments 2, 3 and 4 were fed control diets supplemented with MOS, ginger and garlic supplemented with ROVABIO enzyme respectively. Sensory characteristics such as Color, juiciness, Meaty flavor, Tenderness, Saltiness, overall flavor and acceptability were measured using a 9 point hedonic scale. Results showed no significant difference ($P>0.05$) amongst treatment means.

Keywords: Mannan Oligosaccharides, Ginger and Garlic, Enzymes

INTRODUCTION

There has been a resurgence of interest in improving the physicochemical and sensory properties of meat, as well as its storage life. In pursuit of improved chicken healthiness and in order to fulfil consumer expectations in relation to food quality, poultry producers more and more commonly apply natural feeding supplements, mainly herbs (Gardzielewska *et al.*, 2003). Spices are very common as useful additives in broiler diets (Zhang *et al.*, 2009). The supplementation of spices and herbs have many benefits to broilers health and performance such as having anti oxidative potential (Hui, 1996), antimicrobial activity and enhancing digestion by stimulating endogenous enzymes (Dorman and Deans, 2000). A major problem in the meat industry is a reduction in the acceptability and nutritional quality of meat as well as changes in flavor due to the process of lipid oxidation. Therefore, the development of new convenient meat and meat products with natural flavor and taste. (Cannon *et al.*, 1995). As a result, an approach to overcoming the lipid oxidation problem of the meat industry is to use dietary garlic and ginger supplementation in animals which can reduce lipid stability (Kim *et al.*, 2005).

Mannan Oligosaccharides (MOS) are widely used in nutrition as natural additives and has been used in poultry which showed an improvement in performance, feed conversion and meat quality. Pelicano *et al.* (2003) reported that the concomitant use of MOS in water and feed increases meat quality in relation to color, pH and tenderness. ROVABIO® enzyme is a unique enzyme known to reduce feed costs while consistently maintaining or increasing animal performance and high carcass yield. Hence this study.

MATERIALS AND METHODS

This study was carried out at the meat quality laboratory of the Department of Animal Production and Health, Federal University of Agriculture (FUNAAB), Abeokuta, Ogun State.

A total of 120 broiler birds, were divided into four treatment groups. Each group containing three (3) replicates of 10 birds.

Experimental Layout and Birds Management: Each birds were fed diets containing; Treatment 1 = Control feed supplemented with ROVABIO® enzyme; Treatment 2 = Feed supplemented with ROVABIO® enzyme containing 0.5g/kg Mannan Oligosaccharide (MOS); Treatment 3 = Feed supplemented with ROVABIO® enzyme containing 0.5g/kg ginger; Treatment 4 = Feed supplemented with ROVABIO® enzyme containing 0.5g/kg garlic were fed to all the birds for 6 weeks after brooding with commercial ration for 2 weeks. The experimental diet used for this study is stated thus: Crude protein 23, 5%, Crude fat 4.31 and Metabolisable Energy (MJ/kg) 10.94MJ/ kg.

Daily routine management was carried out such as supply of clean water, feed, observing for sick birds, checking for mortalities and appropriate record keeping.

Slaughtering and processing of birds: At the end of the 8th week, three birds per treatment were killed using the traditional method. Feathers were removed by scalding in hot water at 60°C. Breast muscle was excised to determine sensory quality characteristics.

Sensory evaluations: samples of chicken meat cooked at 70° C for 30 minutes were assessed by ten (10) panelists, where some meat qualities parameters such as color, juiciness, meaty flavor, tenderness, saltiness, overall flavor and overall acceptability were scored using a 9-point Hedonic scale (1=dislike extremely, 2=dislike very much, 3=dislike moderately, 4=dislike slightly, 5=intermediate, 6=like slightly, 7=like moderately, 8=like very much, 9=like extremely) as described by Sanwo *et al.* (Sanwo *et al.*, 2014)

Statistical Analysis

All the data obtained were subjected to a completely randomized design in a one way analysis of variance using SPSS 16 (2005) the means were separated using the Duncan's Multiple Range Test (DMRT) (Steel *et al.*, 1997).

RESULTS AND DISCUSSION

The results of the sensory evaluation of broiler breast muscle fed Mannan oligosaccharides, ginger and garlic with enzyme is presented in Table 1. All values obtained were not significant ($P>0.05$) in this study. However numerically, meat obtained from birds fed the control diet were most preferred in color, juiciness, meaty flavor, and overall acceptability except for saltiness and overall flavor which were most preferred in meat of birds fed diet containing control diet, Mannan Oligosaccharides and Enzyme. Birrenkott *et al.* (2000) reported no difference in flavor in eggs from hens consuming up to 3% dietary garlic powder. Their results may be because of differences in supplemental levels, feeding duration, or preparation method. Nassu *et al.* (2003) reported that an antioxidant such as garlic directly retards oxidized aroma and flavor. Although, results did not show significant differences, the increase in flavor of ginger and garlic-treated samples could be attributed to flavor-producing reactions that occur during cooking (Pawer *et al.*, 2007). However, closely similar values were obtained for overall flavor in treatments 3 and 4. Also, difference in sensory attributes between the treatments recorded higher tenderness score for the samples obtained from treatment 4 which had garlic supplementation (7.19) but had the lowest value for juiciness. Dietary supplementation with MOS treatment resulted in a less desirable color and flavor score (5.71 and 5.77 respectively). Meat from birds fed MOS were saltier than meat from birds fed other supplements with ginger having the lowest value for saltiness.

In conclusion meat of chickens obtained from broilers birds fed mannan oligosaccharides, ginger and garlic supplemented with enzymes did not have any effect on the sensory characteristics

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Table 1. Sensory evaluation of broiler breast muscle fed mannan oligosaccharides, ginger and garlic with enzyme

Parameters	Treatments				SEM
	1	2	3	4	
Color	6.42	5.71	5.85	6.06	0.17
Juiciness	6.35	6.01	6.13	5.71	0.16
Meaty flavor	6.49	5.77	6.42	6.21	0.23
Tenderness	6.71	6.34	6.21	7.19	0.28
Saltiness	5.28	5.39	5.21	5.35	0.08
Overall flavor	5.97	6.28	6.13	6.14	0.13
Overall acceptability	6.99	6.40	6.14	6.52	0.19

SEM: Standard error mean

Treatment 1: Control; Treatment 2: Mannan Oligosaccharides; Treatment 3: Ginger

Treatment 4: Garlic