

EFFECT OF GRADED LEVELS OF TURMERIC POWDER ON MEAT ORGANOLEPTIC CHARACTERISTICS

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ABSTRACT

The experiment was conducted to investigate the effect of turmeric on meat organoleptic characteristics of drumstick of broiler chicken. A total number one hundred and eight day old broiler chicks were divided into three treatment groups in a completely randomised design. The birds were assigned at the rate of 36 birds per treatment in 4 replicates of 9 chicks per replicate. Turmeric powder was supplemented to the feed at the rate of 0, 0.5 and 1.0% during the experiment (8week). At the end of the 56-day feeding trial 2 birds per replicate were slaughtered for sensory meat quality characteristics: colour, flavour, juiciness, tenderness and overall acceptability. Result showed that there was significant increase ($P<0.05$) in the colour of the drumstick of birds on control diet followed by 0.5% and 0.1% which were similar. The juiciness of drumstick of birds on 0.5% was significantly ($P<0.05$) higher than the juiciness of drumstick of birds on other treatments. The result of overall acceptability indicated significant ($P<0.05$) increase in 0.5%. It can be concluded that supplementation of turmeric powder to the diet of broiler chicken had no adverse effect on the organoleptic evaluation of drumstick of broiler chickens.

Keywords : Turmeric, drumstick, sensory evaluation, broilers.

INTRODUCTION

Poultry production focused to optimize growth performance through better growth rate and improved feed conversion efficiency. The performance of birds is mainly dependent on the genetic potentials of bird, quality of feed, environmental conditions and disease outbreaks (Sugiharto,2016). The Rhizome of turmeric is the rich source of bioactive compounds used non-medicinally as a spice and medicinally as human remedies (Khan *et al.*, 2012) when compared with the commercially available antibiotics, turmeric is of natural, non toxic and an ideal food additive usually used in the regular diet (Khan *et al.*,2012).

Restriction on the use of direct-feed antibiotics in many countries has fuelled the interest in alternative products like phytochemicals (a group of natural products) that have been the focus of several studies in recent years. These plant-derived products have been reported to have several beneficial effects from antimicrobial and antioxidant activities to improvement of gut health and growth performance (Yang *et al.*, 2015). For instance some herbal-based products have been included in the diet to improve the gut health of the birds (Mohiti-Asli and Ghanaatparast-Rashti,2015). However, whether these phytochemical additives improve meat quality remains unknown.

The study aimed to determine the effects of graded levels of turmeric on meat organoleptic characteristics.

MATERIALS AND METHODS

The experiment was conducted at the Poultry unit of Teaching and Research Farm, Department of Agricultural Technology, Federal Polytechnic, Ado-Ekiti, Ekiti-State, Nigeria. One hundred and eight (Arboacre breed) day old chicks with an average bodyweight 38.9kg were used for an eight week feeding trial. The birds were allotted in a completely randomized design into three treatments with each treatments having three chicks replicated four times with nine chicks per replicate. The test ingredient turmeric rhizome was purchased at the local market. It was washed, sliced, sundried and grinded into fine particles. The turmeric powder (TP) was mixed with other ingredients and incorporated into the respective diets as 0, 0.5% and 1.0% in 100kg. The diets were mixed and fed *ad-libitum* with adequate clean water supply.

The meats for this study were obtained from 12 slaughtered broiler chicken in the poultry unit of the farm. 12 broilers chicken were selected randomly from each treatment for slaughter. Meat samples of

the drumstick part were collected from the slaughtered chicken for sensory evaluation. The drumstick part was cut to 20g and wrapped with foil paper for all the treatments of the experiment.

Treatments were arranged as T_1 = control, T_2 =0.5% of turmeric inclusion T_3 =1.0% of turmeric inclusion. The meats were subjected to oven drying at a temperature of 80°C for 20 minutes using compact oven (PR305225M model). Sensory evaluation was conducted using the 9-point hedonic scale as described by Ihekoronye *et al.* (1985). A 12-member semi-trained taste panel was set up to carry out the sensory evaluation. Meats were rated for colour, flavour, tenderness, juiciness and overall acceptability.

Data from the organoleptic evaluation were subjected to analysis of variance using SPSS version and treatment means were separated using Duncan Multiple Range Test.

RESULTS AND DISCUSSION

The result in Table 1 shows that there was a significant increase ($P<0.05$) in the colour of the drumstick of birds on control diet followed by 0.5 and 0.1% which were similar. This implies that the colour of the drumstick of birds on 0.5 and 0.1% were least accepted by the consumer while the colour of drumstick of birds on control diet was preferred. The result of juiciness of drumstick of birds on 0.5% was significantly ($P<0.05$) higher than the juiciness of drumstick on other treatments. The highest mean value was recorded in 0.5% at 4.80 while the least was recorded in control diet at 4.08. The result of overall acceptability indicated significant ($P<0.05$) increase in 0.5%. This suggests that the meat of broiler chicken fed 0.5% was overall accepted by consumers. The supplementation of turmeric in the diets of broiler chicken did not have any significant influence on flavour and tenderness of the broiler meat. Gagnon *et al.* (2013) opined the perception and preference of sensory attributes as tenderness and juiciness both perceived with the sense of touch that caused differences in the sensory assessment of meat. These results confirm that the inclusion rate of turmeric powder influenced meats organoleptic characteristic positively.

Table 1: Sensory evaluation of treatment samples of drumstick

Parameters	Diets			SEM	P-value
	1	2	3		
	0%	Tumeric supplementation 0.5%	1.0%		
Colour	2.50 ^a	1.85 ^b	1.69 ^b	0.14	0.01
Flavour	3.82	3.35	3.33	0.26	0.21
Juiciness	4.08 ^b	4.80 ^a	4.45 ^{ab}	0.31	0.01
Tenderness	4.02	4.07	4.08	0.28	0.20
OA	5.42 ^{ab}	5.67 ^a	5.18 ^b	0.35	0.01

^{a,b}, Means with different superscript on the same row differ significantly ($P<0.05$), OA- overall acceptability

CONCLUSION AND RECOMMENDATION

Based on this experimental result, supplementation of turmeric powder to the diet of broiler chicken had no adverse effect on the organoleptic properties or attributes of drumstick of broiler chickens. Using turmeric powder at 0.5% inclusion level in broiler fed has proved to increase juiciness of drumstick of broiler chickens.

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