

IMPACT OF FEED FORM AND PHYTOBIOTIC BLENDS ON SENSORY EVALUATION OF RABBIT MEAT

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ABSTRACT

A ten-week feeding trial was conducted using forty eight (48) 7-8 weeks old crossbreed rabbits to determine the impact of feed forms and phytobiotics blend (turmeric, garlic, ginger and clove) on sensory attribute of rabbit meat. The rabbits were allocated into four treatments. T₁-12 rabbits fed mash diets without inclusion of phytobiotics. T₂- 12 rabbits fed mash diets with 10g inclusion of phytobiotics, T₃- 12 rabbits fed pelletized diets without inclusion of phytobiotic. T₄-12 rabbits fed pelletized diets with 10g inclusion of phytobiotic in a 2x2 factorial arrangement. Data collected on cooked meat to check the aroma, colour, taste and overall acceptability using hedonic scale and were analyzed using analysis of variance. Significant ($P < 0.05$) difference were recorded on aroma and colour of meat. Higher ($P < 0.05$) aroma (6.65 ± 0.12) value was recorded with rabbit fed diet in pelletized form while rabbit fed diets in mash form had the least ($P < 0.05$) value (6.21 ± 0.1). Higher ($P < 0.05$) colour (6.32 ± 0.11) value of meat was recorded with rabbit fed diet in pellet form while rabbit fed diets in mash form had the least ($P < 0.05$) value of meat colour (6.24 ± 0.10). This study concluded that feeding diet in pelletized form and inclusion of phytobiotic blend had positive effect on aroma, colour, taste and overall acceptability of rabbit meat. Therefore it is recommended to feed rabbit with pelletized diet containing phytobiotic blend in order to improve sensory quality.

Key words: rabbit, phytobiotic blend, feed form

INTRODUCTION

In recent years consumers are increasingly conscious of a healthy diet Oshibanjo, *et al.*, (2019). There is human perception which is the sensory evaluation of meat product which is a critical issue for the meat industry. Meat is a source of bioactive compounds which cannot be substitute by plant product Olaoye, *et al.*, (2011). Animal protein intake in Nigeria is reported to be low due to high cost of livestock products from rapid increase in cost of feedstuff Sobayo, *et al.*, (2013). There is need to research more on white meat since nigerians depends mainly on red meat sources for animal protein supply (FAO, 2018) it has been proved to be grossly unhealthy and directly related to cardiovascular diseases Cashman *et al.*, (2017). Phytogetic plant such as turmeric, garlic, ginger and clove possess antibacterial, anti-inflammatory, immunomodulatory properties, flavouring and colouring agent (Okanlawon *et al.*, 2020a; Muhammad *et al.*, 2019). Using the combination of turmeric, ginger, garlic and clove as natural feed additives in rabbit nutrition has not been investigated into. The combination of the four phytobiotic was brought about since it has been reported by (Vispute, 2019) that there are limitations cause by plant species, soil type, location, weather condition, processing and storage that might reduce the potency of active ingredient that can also help to improve the sensory attribute of the meat.

According to (Jafarnejad *et al.* 2010), pelletized feed is a modification of the mash feed. Improved performance in pellet feeding is attributed to a decrease in feed wastage, reduced selective feeding and improved palatability which will also have effect on meat quality (Mirgheleni and Golian, 2009). Meat lipid and chemical composition has effects on the health status of consumers. The use turmeric, garlic, ginger and clove which has been proven to have positive affect on animal health, increase their productivity and improve quantity and quality of the meat. There is a need to research into suitable feed additive and form of feed that can be incorporated and form of presentation to animal in other to produce quality meat.

MATERIALS AND METHODS

The study was conducted at the Rabbitary unit of Institute of Food Security, Environmental Resources and Agricultural Research Federal University of Agriculture Abeokuta.

Fresh Turmeric, Garlic, Ginger and Clove were purchased from Bode Market, Ibadan, Oyo state. Each sample was washed (except garlic and clove) using clean water to remove the dirt completely and where prepared by the method described by (Okanlawon *et al.*, 2020a).

A total of forty eight (48) 7-8 weeks old crossbreed rabbits were used for the study and 2.5g of turmeric, 2.5g of garlic, 2.5g of ginger and 2.5g of clove combination of all this to form 10g of the blend. The animals were purchased from a reputable farm and were acclimatized for two weeks. They were weighed and allotted to 8 treatments on equal weight basis in a 2x2 factorial arrangement comprising of blend (with and without) of rabbits and feed form (mash and pellet). Treatments, T1-12 rabbits were fed mash diets without inclusion of blend. T2- 12 rabbits were fed mash diets with 10g inclusion of blend. T3- 12 rabbits were fed pelletized diets without inclusion of blend. T4-12 rabbits were fed pelletized diets with 10g inclusion of blend. Each treatment having 6 replicates of 2 rabbits each. Before stocking, the pen was cleaned thoroughly and disinfected. The animals were fed with experimental diet containing 16.59% Crude Protein (CP) and 10.53 MJ/kg Metabolizable Energy supplemented in mash and pelletized form. Feed and water were supplied *ad libitum* daily. 200g of meat samples from the thigh muscle were washed in clean water, packed in a transparent polythene bag and tagged for identification. Thereafter, they were boiled in water for 30min and allowed to cool under room temperature and served to 15 panellists that were used for sensory attribute. Using Quantitative descriptive analytical scale on the sensory attributes of aroma colour taste and overall acceptability while 9 point hedonic scale was used for the preference as described by Sanwo *et al.* (2011). Data collected were analysed using analysis of variance (ANOVA) as contained in SAS (2002). Significant means were separated using Duncan Multiple Range Test as contained in SAS (2002).

RESULTS AND DISCUSSION

Table 1 shows the main effect of feed form on aroma, colour, overall acceptability and taste of rabbit meat. Significant ($P<0.05$) difference were recorded on aroma and colour. Highest ($P<0.05$) aroma (6.65 ± 0.12) value was recorded with rabbit fed diet in pellet form while rabbit fed diets in mash form had the least value (6.21 ± 0.1). Highest ($P<0.05$) colour (6.32 ± 0.11) value was recorded with rabbit fed diet in pellet form while rabbit fed diets in mash form had the least value (6.24 ± 0.10). No significant ($P>0.05$) difference was recorded on taste and overall preference. This result can be related to the result of feed conversion ratio and growth performance since it has been reported by Olutokun *et al.*, 2020 and Rahman *et al.*, 2015 that pelletized had positive effect on feed conversion and growth performance and this can also translate to better sensory attribute of meat.

Table 1: Main effect of feed form on sensory attribute of rabbit meat

Parameter	Mash	Pellet	P-value
Aroma	6.21 ± 0.11^b	6.65 ± 0.12^a	0.01
Colour	6.24 ± 0.10^b	6.32 ± 0.11^a	0.001
Taste	6.38 ± 0.12	6.43 ± 0.11	0.76
Overall preference	6.55 ± 0.12	6.57 ± 0.11	0.90

abc: Means in the same row with different superscripts differ significantly ($p<0.05$)

Table 2 shows the main effect of blend on aroma, colour, taste and preference of rabbit meat fed diets containing turmeric-garlic-ginger-clove blend in mash and pellet form. No significant ($P>0.05$) difference were recorded on aroma, colour, taste and preference

but there was preference for the meat that contain the blend which is as a result of the active ingredient that was contain in the blend which has been proven to give good aroma, over all acceptability, colour and taste and this is in agreement with the report of (Purwanti *et al.*, 2017) who stated that the inclusion of turmeric and ginger in the diet of broiler were capable as an additive to increase the physical and sensory qualities of broiler meat.

Table 2: Main effect of blend on sensory attribute rabbit meat

Parameter	Without	With	P-value
Aroma	6.30 ± 0.11	6.56 ± 0.12	0.14
Colour	6.38 ± 0.10	6.61 ± 0.11	0.13
Taste	6.27 ± 0.11	6.34 ± 0.12	0.43
Preference	6.53 ± 0.11	6.60 ± 0.11	0.66

abc: Means in the same row with different superscripts differ significantly ($p < 0.05$)

Table 3 shows the interactive effect of feed form and blend on sensory evaluation of rabbit meat fed diets containing turmeric-garlic-ginger-clove blend in mash and pellet form. No significant ($P > 0.05$) difference were recorded on aroma, colour, overall acceptability and taste. It was reported that rabbit fed diet containing the blend in pelletized form had shown higher value in terms colour, aroma, overall preference and taste which is in line with the report of (Purwanti *et al.*, 2014 and Rahman *et al.*, 2015) who stated that the inclusion of turmeric and ginger in the diet of broiler were capable as an additive to increase the sensory qualities and feeding pelletized diet improve growth rate and feed conversion of rabbit.

Table 3: Interactive effect of feed form and phytobiotic blend on sensory of rabbit meat.

Parameter	Mash/Without	Mash/With	Pellet/Without	Pellet/With	P-value
Aroma	6.01±0.18	6.41±0.17	6.59±0.17	6.70±0.17	0.40
Colour	6.22±0.13	6.25±0.16	6.54±0.15	6.96±0.15	0.18
Taste	6.30±0.17	6.45±0.17	6.63±0.14	6.22±0.18	0.09
Preference	6.50±0.16	6.60±0.17	6.55±0.17	6.59±0.13	0.85

abc: Means in the same row with different superscripts differ significantly ($p < 0.05$)

CONCLUSION AND RECOMMENDATION

This study concluded that feeding diet in pelletized form with inclusion of phytobiotic blend had positive effect in term of aroma, colour, taste and preference of rabbit meat therefore it is recommended to feed rabbit with pelletized diet containing phytobiotic blend in order to improve sensory quality.

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