

THE EFFECT OF GARLIC, GINGER AND PEPPER ON THE SENSORY PARAMETERS OF BARBECUE PREPARED FROM BEEF

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Abstract

This study was conducted to determine the effect of ginger, garlic and pepper on the sensory parameters of barbecue prepared from beef. Beef was purchased from a nearby market, deboned, trimmed of fat and excess connective tissue and then washed with a clean water. The samples were assigned to four (4) treatments, with treatment one (1) being the control. Beef purchased was used to evaluate the sensory parameters of barbecue prepared from it. Twenty (20) semi-trained panelists from the College were used to evaluate the barbecue prepared from beef on six sensory parameters (color, tenderness, flavor, juiciness, texture and overall acceptability) using a nine point hedonic scale. All data were subjected to one way analysis of variance (ANOVA) and mean values showing significant differences ($P < 0.05$) were separate using Tukey's test. The results of the study indicates that there were no significant ($P < 0.05$) differences in all parameters taken for the sensory evaluation. In addition, the highest value of 9.70 and 9.52 were observed in T₄ for colour and flavor respectively. The tenderness and juiciness had higher values of 9.31 and 11.00 respectively in T₁. In conclusion, ginger, garlic and pepper can be used as spices for barbecued beef. Hence, further research is recommended on the adequate quantity of these spices to be used.

Keywords: Beef, Barbecue, Ginger, Garlic, Pepper, Sensory parameters.

Introduction

Beef is one of the best sources of animal proteins, micronutrients, and B-complex vitamins in the human diet. The chemical composition of meat is an important factor determining both in its nutritional value and its suitability for processing meat products (Litwińczuk *et al.*, 2016). Spices such as ginger, garlic, pepper, turmeric, cinnamon, cloves, pimento, and rosemary are seed, root, fruit, bark, berry, bud or vegetable substances primarily used for flavouring, colouring or preserving food (Feng and Liu, 2011). The use of natural spices as a preservative in meat has proved to be a better and safer alternative to the use of chemicals such as nitrites (Santas *et al.*, 2010). Globally, plant extracts are employed for their antimicrobial, antifungal and antiviral properties (Mahesh and Satish, 2008). The component of garlic, ginger and pepper provide a characteristic flavour and well known aroma and also have hypcholesterolemic effect (Yeh and Liu, 2001). Chowdhury *et al.* (2002) reported that components of garlic, ginger and pepper inhibit cholesterol and fatty acid synthesis in the liver. This study aimed at knowing the effect of garlic, ginger and pepper on the sensory parameters of barbecue prepared from beef.

Materials and methods

Experiment site:

The experiment was conducted at the Animal Products and Processing Unit, Department of Animal Production Technology, Oyo State College of Agriculture and Technology, Igboora, Oyo State.

Experimental Materials and procedure:

Beef, Ginger, Garlic, Pepper, Salt, Seasonings, Vegetable Oil, Biscuit and Pure Water. The Beef and test ingredients were purchased from Towobowo market, Igboora, Oyo State. The meat purchased was deboned and was trimmed free of fat and excess connective tissues and washed with water. The chunk of the meat was cut into smaller portions. Slicing was done along the fibre axis of each portion giving very thin slices of about 2mm thickness in continuous sheets. Ginger, garlic, pepper, salt and maggi was then rubbed on the surface of the meat. The samples were subjected to Four (4) Treatments, with Treatment 1 (control), meat samples of the controlled treatment were rubbed with salt and maggi. Treatments 2, 3, 4 were rubbed ginger, garlic and pepper respectively. The meat samples were put on the grill and were left undisturbed for about twenty (20) minutes before turning. They were turned every minute to prevent them from burning. All data obtained were subjected to one way Analysis of Variance (ANOVA) using SPSS 2020 and difference in means were separated using Tukey's test.

Results and Discussion

Table 1 shows the result of sensory evaluation of barbecue prepared from beef. There were no significant differences ($P>0.05$) in the mean values of colour, flavour, tenderness, juiciness, texture and overall acceptability of beef samples. The colour of treatment 4 had the highest value of 9.70, while the lowest value was observed in treatment 1. In treatment 2, flavour recorded the highest value (9.52), while in treatment 1 tenderness and juiciness had the highest scores of 9.31 and 11.00 respectively. Texture had the highest value (11.70) in treatment 4 with the least value obtained in treatment 1 (10.00). The highest value of overall acceptability was observed in treatment 2 (13.50).

Table 1: Sensory evaluation of barbecue prepared from beef

Parameters	T1 (%)	T2 (%)	T3 (%)	T4 (%)	SEM	P Value
Color	9.00	9.20	9.52	9.70	0.35	0.92
Flavor	9.25	9.52	9.30	9.40	0.37	0.10
Tenderness	9.31	8.60	8.80	9.00	0.33	0.92
Juiciness	11.00	9.05	9.70	9.54	0.42	0.45
Texture	10.00	11.60	11.50	11.70	0.47	0.56
Acceptability	11.20	13.50	13.10	12.81	0.65	0.70

^{a,b,c} means in the same row with different superscripts differ significantly ($P<0.05$)

In this research, it was revealed that the value recorded for flavour, juiciness and texture showed an improvement across the treatment with the highest flavour value (9.52%) in treatment 2, while texture and juiciness had the highest values 9.31% and 11.00% respectively in T1. This result was in line with the findings of Aidells and Kelly, (1998) who reported that spices (garlic, ginger and turmeric) improve the flavour, juiciness and texture of meat and meat products. It was observed that the values obtained for colour also improved across the treatments with the highest value of (9.70%) noticed in treatment 4 while the least value was observed in T1. This result agreed with the study conducted by Swan, (1993) who revealed that colour intensity depends on the way the incident light is absorbed or scattered. However, the sensory evaluation showed no significant differences ($P>0.05$) in the parameters taken across board.

CONCLUSION AND RECOMMENDATION

In conclusion, the use of garlic, ginger and pepper on beef barbecue improve it's sensory characteristics as those are what the consumers are looking for in meat products. Further research is recommended on beef barbecue using ginger, garlic and pepper as spices.

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