

EFFECT OF TURMERIC (*Curcuma longa*) MARINADE ON SPENT LAYERS' MEAT

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ABSTRACT

This experiment was carried out at Post-Graduate Laboratory, Department of Chemistry, University of Jos, Jos Plateau state. Twenty spent layers' hen was used for this study. The fresh turmeric was purchased at Fari gada market, washed and blended with distilled water and the deboned spent hen meat was cut into primal cut. The breast, thigh and drumstick were mainly used. The marinated carcass was kept in the refrigerator at the temperature of 10°C overnight in 0%, 5%, 10% and 15% of 1L inclusion levels respectively. On the basis of this experiment, the following meat quality and tenderness parameters were evaluated, shear force (SF), water holding capacity (WHC), extract released volume (ERV) and pH, in a completely randomized design. Data were analyzed using descriptive statistic and ANOVA at $\alpha_{0.05}$. As the levels of inclusions increased, the shear force value decreases. 15% of turmeric extract had the lowest shear force value while control without turmeric extract had the highest shear force values. As the inclusion level increased, the water holding capacity increases. More so, the extract released volume result shows that the control had the lowest value of (17.50%) without turmeric extract while spent layer meat tendered with turmeric extract at 5% had the highest value of (43.75%). The mean pH value was higher in meat from 15% turmeric extract while the control meat had the lowest pH value. In conclusion, spent layers meat can be marinated in turmeric extract up to 10 – 15% /L due to improvement of tenderness.

Keywords: Turmeric extract, spent layer, tenderness, marinate and shear force

INTRODUCTION

Tenderness has been shown to have the largest role in consumer purchasing decisions (Mennecke, Townsend, Hayes, & Lonergan, 2007). The tenderness of a piece of meat is a result of several factors which can be considered sequentially. Spent layers are raised to lay eggs, and when their productivity declines, they are processed for their meat which is tough. A number of attempts have been made to tenderize and improve the qualities of meat such as spent layer meat.

There have also been attempts to physically tenderize meat by pressure treatments, electrical stimulation and the use of enzymes. Proteolytic enzymes derived from plants such as papain, bromelain and ficin have been widely used as meat tenderizers in most parts of the world (Wada *et al.*, 2002). Such Proteolytic plant enzymes can be found in turmeric. The aim of the study is to seek the effect of the endogenous enzyme level of turmeric as a meat tenderizer on spent layer meat.

MATERIALS AND METHODS

Experimental site

This experiment was carried out at Post-Graduate Laboratory, Department of Chemistry, Faculty of Natural Science, University of Jos, Jos Plateau state. On latitude 9.9181°N and longitude 8.8804°E

Methodology

Twenty spent layers' was used for this study. The birds were slaughtered following standard procedure, dressed hygienically and manually deboned. The fresh turmeric was obtained from Our Lady of the Angels Cistercian Monastery, P. O. Box 6976, Nsugbe, Onitsha Anambra State, Nigeria., washed and blended with distilled water and the deboned spent hen meat was cut into primal cut. The breast, thigh and drumstick were mainly used. The marinated carcass was kept in the refrigerator at the temperature of 4°C overnight to ensure easy mincing and marinated in 0%, 5%, 10% and 15% of 1L inclusion levels respectively.

On the basis of this experiment, the following meat quality and tenderness parameters were evaluated.

Shear Force Value

The objective evaluation of tenderness was performed using the modified Warner Bratzler shear force procedure (Bouton and Haris, 1978).

Physical evaluation**1. Water holding capacity**

Water Holding Capacity (WHC) was determined according to Wardlaw, Maccaskill, and Acton (1973).

2. Determination of extract release volume (ERV)

The technique was first described in Jay, 1964, has been shown to be a value in determining incipient spoilage in meat as well as in predicting refrigerator shelf life.

3. pH

pH value was taken according to method described by AOAC (2000).

Experimental Design and layout

Completely randomized design.

Data analysis

The data obtained was statistically analyzed with the SPSS program for Windows (SPSS version 11.5, SPSS Inc., Chicago, IL, USA). Duncan's multiple-range test was used to compare the different between the means.