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EFFECT OF RED PITAYA POWDER (*Hylocereus guatemalensis*) AS NATURAL ANTIOXIDANT IN ALPACA MEAT SAUSAGE (*Vicugna pacos*) PROCESSED BY SOUS VIDE

Llano-Jallahui Mirian E.[1], Aro-Aro Juan M.[1,2*], Elias-Peñafiel Carlos[3], Farfán-Rodríguez Lucero[3]and Encina-Zelada Christian R.[3]

[1] Department of Agroindustries, Altiplano National University, Puno – Peru.
[2] Doctoral Program, Graduate School, Altiplano National University, Puno – Peru.
[3] Department of Food Technology, Food Industry Faculty, National Agrarian University La Molina, Lima–Perú.
*Corresponding author email: jmaro@unap.edu.pe

I. INTRODUCTION

Meat is certainly a nutritious food and it is worth to be explored in sous vide application to be served as a ready-to-eat product [1]. Alpacas represent an important meat resource for rural Andean families [2]. Lipid oxidation is a major cause of quality deterioration and reduced shelf life of prepared meat products and can be accelerated by several factors such as increased levels of unsaturated fats, polyunsaturated fatty acids, oxygen, heat, UV light, metal ions, meat/heme pigments, and oxidized enzymes [3]. Reformulation of meat products based on processing strategies has drawn the attention of meat manufacturers seeking to develop innovative meat products that promote better consumer health or achieve better lipid compositions [4]. Texture is a multi-parameter attribute, and one of the most important components of meat products quality. Many factors affect final texture of fermented sausages, including ripening conditions. When textural characteristics are evaluated throughout the manufacturing process, instrumental measurements are suitable [5]. Therefore, the objective of this study was to evaluate the antioxidant efficiencies of pitaya powder and determine its effect on the texture of alpaca meat sausages by sous vide cooking process.

II. MATERIALS AND METHODS

Processing of alpaca meat sausages and sampling. Pitaya powder (PP). The cooked alpaca meat sausages consisted of lean and the following ingredients (in g/kg of lean) were added: lard, ice, PP T1 = 0 PP, 30min. 60°C. T2 = 10% PP, 30min. 60°C. T3 = 20% PP, 30min. 60°C. T4 = 0 PP, 30min. 80°C. T5 = 10% PP, 30min. 80°C. T6 = 20% PP, 30min. 80°C. Hopped meat and ingredients mixture was manually stuffed into collagen casing Sausages were cooked for 30 min at 60°C and 30 min at 80°C. The effect of anthocyanins was evaluated on the oxidative stability of cooked alpaca meat sausages, during storage, by measuring thiobarbituric acid reactive substances (TBA) values. The amounts of TBARS were expressed as mg of malondialdehyde (MDA) per g of meat. Texture profile analysis (TPA) was performed with a texture analyzer (Instron 3365) at room temperature. Three measurements from different locations at each of sample were taken. The analysis of variance (ANOVA), Duncan's multiple-range test were carried out using SPSS, 27. The significance level was 0.05.

III. RESULTS AND DISCUSSION

To evaluate the antioxidative capacity of PP in model sausages, we analysed the changes in TBA values when sausages (Fig.1). TBA value of the negative control (T1 and T4) reached the maximum value on first day and maintained more or less similar value throughout the storage period. In contrast, TBA values of PP added sausages showed similar tendency to positive control of synthetic antioxidant, five days TBA values were close to the TBA value of 20% PP sample. With the addition of PP antioxidative capacity of sausages changes in decreasing order up to 10% of PP. However, it showed a similar antioxidative capacity at the concentration of 20%. Although they showed significantly different amounts. Addition of PP suppressed the lipid oxidation by 83% compared to the 20%. of PP concentration based on the 5 day results.
TBA values in 20%. PP maintained less than 0.8 mg/g during storage at 37°C.
In the present study, (Table 1) we used the sous vide cooking method, where in the sausages were placed inside a plastic bag and immersed in a hot water bath to attain consistent temperature in all the sausages. It is possible that the cook loss resulting from this method of cooking might be lower than what would be expected from traditional cooking on a skillet or a grill as losses due to evaporation in addition to drip loss during cooking would result in higher cook loss. Although they showed significantly different between treatments.

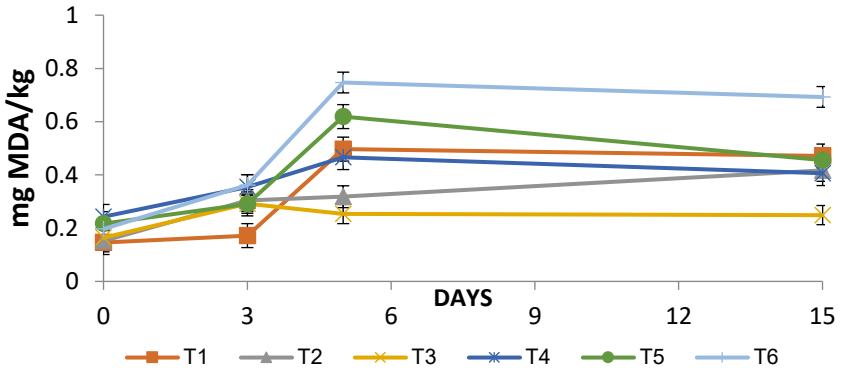


Figure 1. Effects of different concentration of PP on TBA values of sausage stored at 37°C.

Table 1. Texture profile analysis attributes of alpaca meat sausage

Treatments	Hardness (gf)	Cohesiveness	Elasticity	Chewiness (gf)	Stickiness (gf-mm)
T1	5839.170	0.655	0.902	3464.655	41.620
T2	3675.735	0.622	0.845	1923.785	40.045
T3	3431.175	0.530	0.845	1497.290	42.635
T4	7653.518	0.594	0.885	4007.645	6.624
T5	6730.752	0.613	0.885	3623.757	20.725
T6	5205.795	0.560	0.860	2519.833	9.305

IV. CONCLUSION

This study concluded that the addition of 100g. PP provide an antioxidant benefit to the cooked alpaca meat sausages, the Pitaya powder could be used as a natural food additive to extend the shelf life of meat products, and may attract the consumers who prefer natural food additives than those of synthetic origin.

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