ROLE OF CARRAGEENAN IN INTERMEDIATE MOISTURE MEAT PRODUCTS PROCESSED UNDER HIGH SALT CONCENTRATION

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Introduction

Intermediate moisture meat products (IM) are processed almost in every country and as refrigeration costs increase, IM gains renewed interest (Chang et al. 1996). Charqui meat (ChM) is a typical Brazilian IM and is a result of application of the so-called hurdle technology in its processing (Leistner, 1987). The final Aw value is 0.70-0.78 as resultant of chemical reactions equilibrium among NaCl, protein and moisture available within the meat system. Recently, we demonstrated the fermented nature of the product and *S. carnosus* was isolated during its processing and they can be applied as starter culture (Pinto et al., 2002). Despite of all the describe qualities ChM has been shown not to be a tender meat product (Youssef et al., 2007). Carrageenan (CAR) was applied due to its chemical property to react with proteins to improve yield, texture, and sliceability in processed meat products (De Freitas et al., 1997). Thus the objective of this work was to apply carregeenan in order to improve the texture and acceptance of charqui meat.

Material and Methods

Charqui meat processing was carried out according to the methodology described elsewhere (Shimokomaki et al. 2003) and CAR was added following these steps: solution of 0.2-1.0% CAR was dissolved in 2.0-15.0% brine and was manually injected in *V. lateralis* and kept for 24h immersed in CAR solution. Thereafter samples were submitted to dry salting on which the meat pieces were stacked into piles separated from each other by layers of coarse marine salt. After about 24h, the meat is restacked and the uppermost meat pieces are repositioned at the bottom of the new piles (Shimokomaki et al., 2003).

Processing Yield, Texture and Sensory Analysis Evaluation

Yield was calculated by the ratio of charqui meat mass and starting raw material mass, times 100. Texture was measured as in Bouton *et al.* (1971). Desalted charqui meat samples were submitted to a paired comparison test of acceptance between treated samples against the control samples.

Statistical analysis

The texture and sensorial experimental data were submitted to analysis of variance, Tukey test for mean comparison and factorial analysis using the Statsoft (1995).

Results and Discussion

Results showed that CAR hold maximum amount of water of 57.0% in an injection of 1% solution followed by dry salting of up to 15.0% NaCl and under these conditions carrageenan also kept its functional property of holding water even at lower temperature (Fig 1a). This is an unusual result since it is usually necessary to warm the hydrocolloid solution up to 70ºC and by dropping down the temperature there is a gelation of the solution entrapping the water molecules making the succulence of the product (Bater et al. 1993). Our result is in accordance to the reported experiments of De Freitas et al. (1997) of using cold condition and CAR maintained this WHC in meat products. As shown in Fig 1b, there is a synergic action between CAR and NaCl increasing the processing yield. Under conditions of 1.0% CAR and 15.0% brine, the processing yield reach the value up to 100% of the original weight of raw material indicating a straight relationship between CAR and NaCl ions associated to miofibrillar proteins.

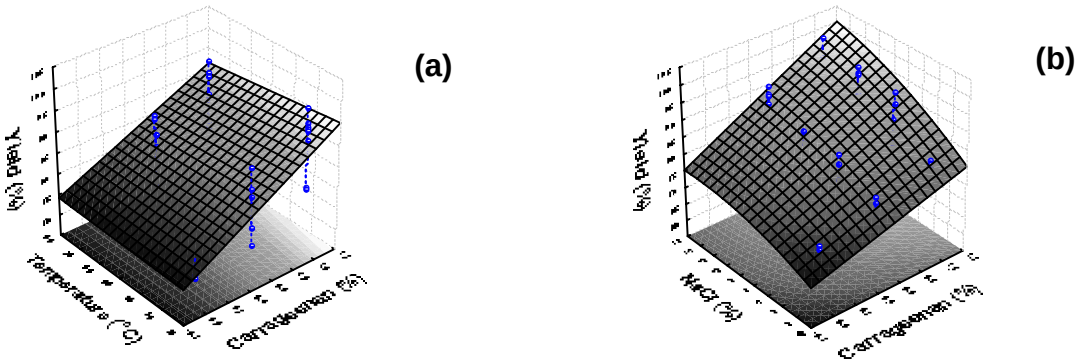

Figure 1. Yield of charqui meat production in relation to carrageenan concentration (1a), temperature processing and salt concentration conditions (1b).

Conclusions

The best conditions for carrageenan to hold maximum amount of water and highest processing yield were 1.0% of carrageenan and 15.0% brine at 70ºC. Charqui meat shear force was lower than control and had a better preference by panelists in relation to texture. Results of this experiment clearly indicated the insight of new technological development for production of charqui meat of better sensorial qualities and higher processing yield.

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