

EFFECT OF LOW SALT CONTENT IN THE QUALITY OF PAINHO DE PORTALEGRE, A TRADITIONAL PORTUGUESE SAUSAGE – RHEOLOGICAL AND SENSORIAL ASPECTS

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Introduction

Despite the benefits of salt (NaCl) (mainly its role in the control of micro organisms and its influence on food taste), its abused use is more and more censured. In fact, heart disease is often correlated with the excessive consumption of NaCl (Truswell, 1994; Ibáñez *et al.*, 1995). As a result, food production with low salt content has increased over the last number of years (Gou *et al.*, 1996; Gimeno *et al.*, 2001; Muguerza *et al.*, 2004). In Portugal, in traditional sausages salt content is typically 5-6%. Nowadays NaCl levels above 3% are recommended. The objective of this work was to evaluate, the effect of reduced salt content in one type of Portuguese sausage, on the rheological and sensorial characteristics of this product.

Materials and Methods

“Painho de Portalegre” is a traditional Portuguese sausage (length: ± 30 cm; diameter: 4-5 cm; curing period: 40 days; ingredients: meat, fat, salt (NaCl), garlic and fermented *Capsicum annum* L.) made with meat and fat from the Alentejano pig breed, a Portuguese breed. Sausages with 3% and 4.5% of NaCl after the curing period were produced. From each group 5 samples were taken. The rheological analyses included: Texture Profile Analysis (parameters: hardness, cohesiveness, springiness, gumminess, chewinness) and cutting test. For sensorial analysis the attributes evaluated were: colour intensity, off colours, aroma intensity, off aromas, taste intensity, off taste, tenderness, salt intensity and global evaluation.

For statistical data treatment, an ANOVA was performed, using Statistica 5.1 program, and means were compared using the HSD Tukey method.

Results and Discussion

Rheological tests revealed, for all the characteristics studied, higher values from products with 4.5% NaCl (Table 1). Salt (NaCl) increased meat protein binding properties and consequently it interferes with textural characteristics of sausages (Fernández, 2000). For that reason the results for hardness and cohesiveness are significantly higher in sausages with 4.5% NaCl.

Table 1: Rheological characteristics of “Painho de Portalegre” with 3% and 4,5% of NaCl – means and standard deviation.

NaCl	Hardness (g)	Cohesiveness	Springiness	Gumminess (g)	Chewinness (g)	Cutting test (g)
3%	797,1 a $\pm 456,6$	0,74 a $\pm 0,03$	0,78 $\pm 0,06$	590,8 $\pm 342,0$	475,0 $\pm 308,9$	750,1 $\pm 434,4$
4,5%	2032,5 b $\pm 1295,5$	0,79 b $\pm 0,04$	0,81 $\pm 0,10$	1626,4 $\pm 1117,8$	1349,4 $\pm 1034,4$	1957,1 $\pm 1269,3$

Different letters in the same column represent significantly different means.

Sensorial analysis carried out (Table 2) shows that colour intensity, aroma intensity, taste intensity and global evaluation attributes of sausages with 4.5% NaCl samples had higher values. The role of NaCl as a promoter of flavour could explain those results.

Table 2: Sensorial evaluation of "Painho de Portalegre" with 3% and 4.5% of NaCl – means and standard deviation (results obtained using a scale from 0 to 100).

NaCl	Colour intensity	Off colour	Aroma intensity	Off aroma	Taste intensity	Off taste	Tenderness	Salt intensity	Global evaluation
3%	59,1 ±16,4	4,8 ±14,0	58,7 a ±17,6	9,1 ±19,7	56,6 ±24,1	7,4 ±21,0	65,9 ±23,9	46,6 a ±18,1	52,9 ±20,9
4,5%	68,1 ±15,4	3,81 ±13,6	67,8 b ±9,4	8,8 ±19,7	68,4 ±15,1	8,2 ±17,2	65,9 ±22,7	61,1 b ±9,7	63,6 ±12,7

Different letters in the same column represent significantly different means.

Conclusions

"Painho de Portalegre", a Portuguese traditional sausage, with 3% salt content showed good textural and sensorial characteristics. However, a sensorial panel revealed a preference for sausages with 4.5% salt content. Therefore, this value is acceptable and considerably lower in comparison with the values commonly used for traditional Portuguese sausages, 5%-6% salt content.

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