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Medellín-type cooked cured ham: Effect of protein, aditives and moisture retaining blendings upon texture and sensory analysis (#572)

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Introduction

In Colombia, the search of processed meat products economically more competitive, forced to the meat industry to look for several solutions in order to satisfy its demands. This adpatation is complicated since requiere the adaptation processing operation lines with the compliance with colombian food regulations as well as consumers acceptation. Processed meat products are complex systems in which the soluble meat protein (in saline solutions) heat induced, produce gels that reitain water and fat, that are responsible for the final product texture. Food additives companies and Meat industries that want to remain in the Colombian market, have no other option that acquire new knowledge and innovation that could add more value added to their products. Medellin-type cooked cured ham is a well apreciated meat product to Colombian consumers. The aim of this work is to offer an alternative for the small and medium meat enterprises producers in Colombia, in order to be more competitive through the technological evaluation of blendings of additives and ingredients that can be used to increase water binding capacity without affecting their nutritional, textural and sensory properties.

Methods

ToelaborateMedellin-Typecookedhammodelsystems,sixmixturesweretested: X2: Mix of a pig collagen protein; X3 : Mix porcine globin protein; X4: Mix of carrageenan for meat emulsion type products; X5: Mix of sodium tripolyphosphate, tetrapotassium diphosphate, sodium hexametaphosphate for food; X7: Mix of starch and vegetable fibers; X11: Mix of isolated and concentrated soy proteins. A statistitical model desig of six (6) components with restrictions of protein level and raw material cost for the mixture and (3) three central points was applied. After obtaining the best regions (data no showed), was defined the best three mixes and It was used in the elaboration process of Medellin-type cooked ham.(N7 and N8) evaluated in permeable and non-permeable casing.

Medellin-type cooked ham model system elaboración process: All the ingredients of each mixture were mixed into a cutter to guarantee the homogeneity, then, each mixture was heat treated (cooked oven) until reach the internal temperature of 72 ° C; then they were cooled in cold water showers of cold water and mantained for 24 hours in cooling chamber (4 ° C). Brining: It was done according to colombian industrial practices. The tumbling procesing was carried out for 2 hours at 4 °C in a mixer. All the hams were provided with a 12 hour rest at 4 ºC, before being stuffed in permeable a non-permeable casing using a stuffing machine. Hams were cooked until an internal temperature of 72 ° C; then they will be cooled in cold water showers and taken to a cooling chamber at 4 ° C for 24 hours. Each experiment were elaborated by triplicate (batchs of 25 kg).

ANALYTICAL METHODS

Texture. Texture profile analysis using Brookfield CT3 Texture Analyzer (BrookfieEngineering Labs, USA). at room temperature. A cylindrical aluminum probe 50 mm in diameter will be used. With two compression cycles at a crosshead speed of 5.0 mm / s, the tension of 50%, the surface of force detection of 99.0 g, and the threshold of 30.0 g in 1 s time interval between the first and second compression. The data will be analyzed using the Texture ProCT software (Brookfield Engineering Labs, USA). Samples of the cooked ham will be cut into 20 x 30mm cylinders using a stainless steel cutter (Premac, Itagüí, Colombia).Sensory analysis. Difference with control (DFC). The training and sensory analysis of the group of judges under the Colombian Technical Standards applied to the Sensory Analysis of Foods.

Results

ANOVA test results can be observed in Table 1:

Table 1. ANOVA results for hardness (g) for all blends of additives and ingredients (type II tests)

	Sum	Sq	Df	F	value	Pr(>F)
	X11	577	1	1,0769	0,329741	
	X3	7754	1	14,4687	0,005209	**
	X4	304626	1	568,4499	1,02E-08	***
	X5	4916	1	9,1744	0,016336	*
	X2	219629	1	409,841	3,70E-08	***
	X7	596	1	1,1121	0,322436	
	X11:X5	2630	1	4,9074	0,057605	.
	X3:X2	30032	1	56,0405	7,02E-05	***
	X4:X2	56282	1	105,0261	7,07E-06	***
	Residuals	4287	8			

- There is synergy between X3 and X2
- There is synergy between X4 and X2

Notes

• There is no synergy between X3 and X4

It could observed that, there are interactions between different ingredients (gums, carrageenans, soy proteins, wheat proteins, alginates, pork proteins) and meat and meat protein (Gao et al 2016). For sensory analysis no statistical differences betwen N7, N8 and Control samples were not found, Also in figures 1 and 2 this behaviour can be observed.

REFERENCES
Gao, X. Q., Hao, X.Z., Xiong, G.Y., Ge, Zhang, W.G., Zhou, G.H., Yue, X.Y. 2016. Food and Bioproducts Processing 100: 47–53

Conclusion

N7 and N8 mixtures does not show statistical difference with a commercial reference and it is technically viable opción for the Colombian processed meats market. Thus, these mixtures offers an alternative to develop new products and improve competitiviness in the meat sector.

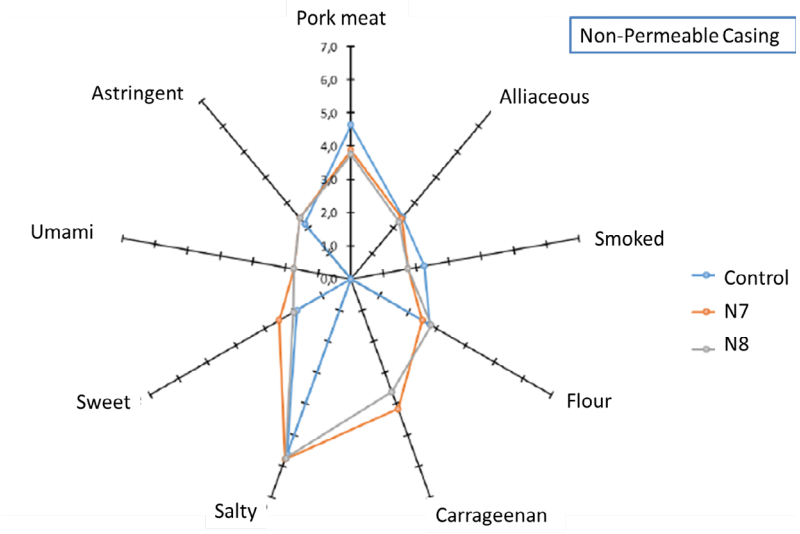

Figure 2. Sensory analysis for cooked hams added with N7 and N8 blends in non-permeable casings

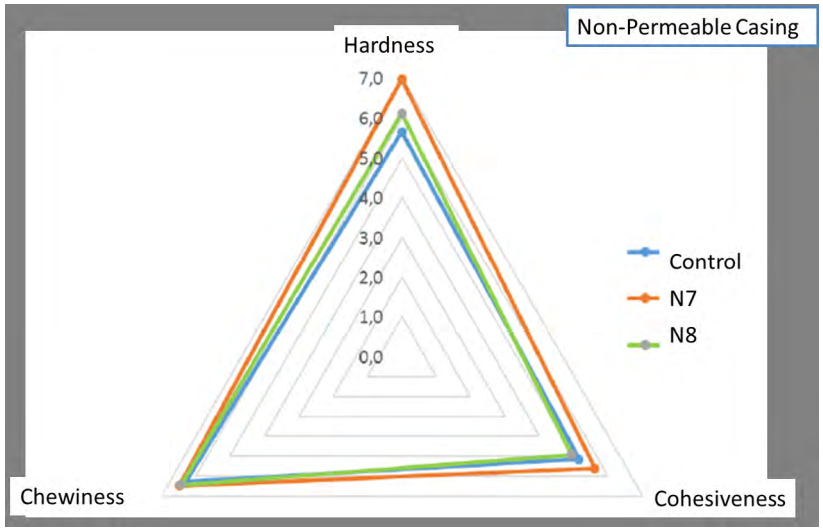

Figure 1. TPA curves of cooked ham added with N7 and N8 blends in non-permeable casings

Notes