



ENRICHMENT OF THE ITALIAN SALAMI WITH INSOLUBLE WHEAT FIBER

Terra, N. N., Terra, A. M., Peña, C. V. M., Terra, L. M., Milani, L. and Fries, L. L. M.,

Departamento de Tecnologia e Ciência dos Alimentos – CCR – Universidade Federal de Santa Maria – 97105-900 -
Santa Maria – RS – Brazil - e-mail: nelcindo@terra.com.br

Background

Since the old times, the Italian salami is known as a sausage of thick mass, fermented and ripened (Lizaso et al, 1999). The fat content of the salamis results in a consumption obstacle for this product by people who show cardiovascular and nutritional problems. The salami's fat is partly responsible for the sensorial characteristics of the product, when the tissue enzymes and bacterial lipolysis takes place. The drastic reduction of salami's fat would implicate in sensorial alterations, which are capable to turn the product unacceptable by the consumer, such as the aroma and flavor alterations (Demeyer et al, 1996). The fiber addition in the salami production without reducing the fat content could be a way of improving the nutritional value without altering the sensorial characteristics of this meat product.

Objectives

The objective of this work was to evaluate the effect of the addition of insoluble wheat fiber to the Italian salami, on its acceptability by a non-trained panel and the pH, moisture, fat content and water activity changes.

Materials and methods

For this experiment the Italian salami was elaborated using three treatments as following: Treatment 1: control, without the addition of starter culture nor the insoluble wheat fiber; Treatment 2: only the addition of starter culture and the Treatment 3: the addition of the starter culture as well as the insoluble wheat fiber. All the treatments were obtained by grinding the pork and bovine meats and adding salt, cure salts, seasonings and antioxidant. The stuffing was done using a natural casing (Terra, 1998). The starter culture used was a combination of *Lactobacillus plantarum* and *Staphylococcus xylosum*. Each treatment had 18 samples. Moisture, fat content, pH and water activity were determined (Terra & Brum, 1988). The sensorial analysis was accomplished by 15 non-trained judges. The analyzed sensorial parameters were appearance, color, odor, flavor and texture.

Results and discussion

The insoluble wheat fiber addition in the Italian salami reduced the moisture in the treatment 3 (Table 1), reducing the water activity (a_w) of the product. The reduction of a_w (Table 1) caused by pH drop reduces the water availability for biochemical and physical-chemical reactions, which are necessary for the growth and the multiplication of microorganisms and the possible toxins formation (Jay, 1994). The reduction of the pH values is responsible for the water liberation from the product, for the formation of sensorial characteristics of the salami and for the aid the homofermentative acid lactic bacteria to overcome the contaminant flora through the competitive antagonism. The fat content was important for endogenous and bacterial lipases, because they are the main responsible enzymes for the liberation of free fatty acids during ripening, with preferential release of poly-unsaturated fatty acids (Demeyer *et al*, 1996). The importance of lipolysis for lipid oxidation and thus, flavour promoting effect is often assumed. All the treatments were approved with grades superior than 5.0 (Table 2). The starter culture in the treatments T2 and T3 contributed for the acceptability of the product, and the insoluble fiber of wheat did not significantly differ ($p < 0.05$) in the acidification and flavoring.



Table 1. The pH, moisture, fat and water activity values of the Italian salami treated with insoluble wheat fiber in the presence or absence of *Lactobacillus plantarum* and *Staphylococcus xylosum*

<i>Determinations</i>				
Treatments	pH	M(%)	F(%)	Aw
T1	4.8	32.1	32.7	0.9
T2	5.2	39.4	31.6	0.86
T3	5.1	37.9	32.1	0.82
Mean	5.03	36.46	32.10	0.88

T1= control

T2= Italian salami treated with *Lactobacillus plantarum* and *Staphylococcus xylosum*

T3= Italian salami treated with *Lactobacillus plantarum* and *Staphylococcus xylosum* and insoluble wheat fiber

M= moisture F= fat Aw= water activity

Table 2. Sensorial characteristics of the Italian salami treated with insoluble wheat fiber in the presence or absence of *Lactobacillus plantarum* and *Staphylococcus xylosum*

<i>Sensorial properties</i>					
Treatments	Appearance *	Color *	Odor *	Flavor *	Texture *
T1	7.8	7.9	7.0	6.0	6.0
T2	8.0	8.5	8.2	8.5	8.1
T3	6.9	6.5	6.3	6.9	6.5
Mean	7.56	7.9	7.0	6.0	6.0

T1= control

T2= Italian salami treated with *Lactobacillus plantarum* and *Staphylococcus xylosum*

T3= Italian salami treated with *Lactobacillus plantarum* and *Staphylococcus xylosum* and insoluble wheat fiber

*The values correspond as: > 5.0 = acceptable; < 5.0 = unacceptable

Conclusions

The insoluble wheat fiber addition can enrich a product without altering the sensorial characteristics. The insoluble wheat fiber added to a fermented sausage is a new meat product and it is a healthier option for the consumer.

References

- DEMEYER, D AND RAEMAEEKERS, M. 1996. Lipolysis and proteolysis in meat fermentation. Proceeding of the workshop at the 42nd International Congress of Meat Science and Technology. Lillehammer. 47.
- LIZASO, G.; MOCKERY, J.; AND BERIAIN, M. J. 1999. Microbiological and biochemical changes during ripening of salchichón, to Spanish dry cured sausage. Food Microbiology. 16: 219-228.
- JAY, J. 1994. Microbiología Moderna de los Alimentos. 3 ed. Zaragoza: Acribia. p. 804.
- TERRA, N. N. AND BRUM, M. A. R. 1988. Meat and yours derived - techniques of control of quality. São Paulo: Nobel. 121p.
- TERRA, N. N. 1998. Apontamentos de Tecnologia de carnes. São Leopoldo: Publisher Unisinos. 216p.