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The "Salchichón de Vich" (Vich sausage).II.- Evolution of chemical parameters during the curing process and valoration of his organoleptic quality.

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## Introduction

In the previous chapter we have described the elaboration of the "Salchichón de Vich" and the evolution in bacterial flora during his fermentation and curation process.  
In these chapter are described the changes in chemical parameters and a palatability test with a panel of five members over hedonic scale(Peryam,1952).

## Analytical methods

The analytical methods for the determination of dry matter, crude protein(Kjehldal method) crude fat(ether extract)and ash are the E.E.C. standart methods. Total sugars are determined by Luff-Schoorl method after acid hydrolysis of water extract. Salt (NaCl) is determined by Volhard method. Nitrates are analysed according ISO/3091 method and nitrites by ISO/DIS 2918 method. The total organic acids are determined by direct titration of a blendet sample of 10 g of meat and 10g of distilled water. The pH is determined on the blended product 10/10 described with electrodes of CRISON pH-meter Digit 501.  
The Total Non Protein Nitrogen (NPN), free  $\alpha$ -NH<sub>2</sub>-N are determined over the extraction fraction of sausage with HClO<sub>4</sub> 0,6N (Dierick,1974).The NH<sub>3</sub> by Pearson method(1976). The Tyrosine by the Folin method(J.Fd.Sc. 1969) and Hydroxiprolina as described by Cipriani(1979).  
The quantitative determination of Free Fatty Acids(FFA) and Peroxide Index by Pearson(1976) previous extraction of cube fat from the samples with nippers.  
The palatability score was conducted qith five members on odor,taste, color and texture factors since de second month of curing process.

The fermented sausages of "Salchichon de Vich" examined are of one batch elaborated in November of 1984 by a manufacturer of the Vich city.

In each control we take a whole piece of "Salchichón de Vich" with a weight of  $2,5 \pm 0,3$  Kg (at the initial time of curing process).The samples are controlled just stuffed the meat in the casings, at 15 days,2,5,8,12 months of curing process. The carcass weight of the hogs utilized in the batch of "Salchichón de Vich" are of 125Kg(mean weight).

## Results and Discussion

Table 1 shows the changes in chemical parameters of "Salchichón de Vich" during his curing process. It can be seen that it is a cured dried sausage "NON ACID" because his pH remains over 5,50 during all his technical process. The absence of carbohydrates added to the composition of the "Salchichón de Vich" avoids the production of acids in sensible quantity. Only the natural meat sugar Glycogen is present at the beginning of process and it disappears rapidly. The maximal drop in pH coincides with the maximal quantity of organic acids and the fading of Glycogen.  
The dry matter increase to the 70% during the curing process of one year. The nitrification is concluded practically in the firts two weeks of process and after two months the residue of free nitrate is null.

Table 2 shows the concentration of NPN compounds expressed as mg N/100gr of dry matter. These dates shows that during the firts 15 days of fermentation, the production of NPN compounds reaches a maximal rate. The production rate of free  $\alpha$ -NH<sub>2</sub>-N not decreased until the cellar phase conclusion. The NH<sub>3</sub>-N has a production rate positive until the end of fermentation period and decreased in the cellar time. The free aminoacids as Tyrosine attains a maximal quantity during the firts two months of fermentation process and descends rapidly during the cellar period. These results indicate that free aminoacids are produced at faster rate then the basic compounds like ammonia and that the free  $\alpha$ -NH<sub>2</sub>-N increases in the total NPN from the initial 48% to final 70%.

Table 3 shows the changes in the levels of Free Fatty Acids(FFA) and Peroxide Index of the fat of "Salchichón de Vich" during the period of one year of his curing process. The results are expressed over the fat content of sausages. The lipolysis and oxidation of fat components of sausage are a processes with a intensity accrued during the cellar phase. It seems that tissue lipases are also very actives in the hidrolisis and oxidative changes of fat in the fermented and dried sausage "Salchichón de Vich".

Table 4 shows the results of a palatability test of "Salchichón de Vich" over a hedonic scale and valued by 5 members. It can be concluded that the maximal organoleptic quality of these fermented dried sausage is reached between the 5 and 9 months of his curing process. And these organoleptic quality coincides with the maximal values of free  $\alpha$ -NH<sub>2</sub>-N and NH<sub>3</sub>-N compounds

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Table 1- Changes in chemical data during the curing process of "Salchichón de Vich".

	Curing periods					
	Initial meat paste	15 days	2 months	5 months	8 months	12 months
Dry matter(DM)(%)	36,32	38,84	43,52	62,96	68,63	72,24
Protein (%)	18,50	19,29	21,60	31,33	34,30	36,24
Protein over D.M.(%)	50,93	49,66	49,63	49,76	49,98	50,16
Fat (%)	13,89	15,17	17,40	25,05	27,01	28,33
Fat over D.M. (%)	38,24	39,05	39,98	39,78	39,35	39,22
Ash (%)	3,65	3,96	4,36	6,40	7,04	7,39
Ash over D.M. (%)	10,05	10,19	10,02	10,16	10,25	10,23
Total sugars(as glucose)	0,27	0,19	<0,10	<0,10	<0,10	<0,10
Salt (NaCl) (%)	2,64	2,82	3,16	4,56	4,96	5,20
Sodium Nitrite (ppm)	<5	<5	6	7	<5	<5
Sodium Nitrate (ppm)	294	34	15	<10	<10	<10
Total organic acids(%)(a)	0,53	0,58	0,63	0,74	0,84	0,97
pH	5,88	5,72	5,91	6,35	6,50	6,52

(a) as lactic acid

Table 2 - Concentration of NPN compounds during the curing process of "Salchichón de Vich"  
mg N/100g of dry matter

	Curing periods					
	Initial meat paste	15 days	2 months	5 months	8 months	12 months
Total NPN	1.184	1.416	1.421	1.402	1.876	1.798
N- NH <sub>3</sub>	19	51	99	227	281	303
Free α -NH <sub>2</sub> -N	578	772	829	881	1.244	1.259
Tyrosine	91	114	193	108	71	58
Hydroxiproline	512	489	483	476	466	465

Table 3 - Changes in levels of Free Fatty Acids(FFA) an Peroxide Index during the curing process of "Salchichón de Vich".

	Curing periods					
	Initial meat paste	15 days	2 months	5 months	8 months	12 months
F.F.A. (g/100g as oleic acid)	1,30	1,78	2,68	4,52	5,68	10,60
Peroxide Index (meq/Kg)	<0,10	<0,10	0,24	1,03	1,91	3,52

Table 4 - Palatability tests of "Salchichón de Vich".Mean palatability scores.

	Curing periods					
	Initial meat paste	15 days	2 months	5 months	8 months	12 months
Palatability factor						
Odor	-	-	5,8	8,1	8,5	8,0
Taste	-	-	5,5	8,0	8,7	8,1
Color	-	-	7,3	7,2	7,2	6,8
Texture	-	-	6,8	8,2	8,5	7,9

