

Study of the shelf life of a raw and dried meat product

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INTRODUCTION

A raw and dried meat product are made of meat and pork and/or beef fat mixed with spices and additives, stuffed in natural or artificial gut and subjected to a maturing and drying process.

This kind of product emerged because of man-needs to preserve food through a drying process and low pH. Being stuffed, meat was isolated from outer microorganism or contamination.

Stages of preparing a raw and dried meat product are:

- 1- Receipt of raw materials.
- 2- Meat and fat cold preservation
- 3- Mincing
- 4-Mixing and kneading, spices addition, salt, approved additives, starters and sugar
- 5- Stuffing (+ *Penicillium chrysogenum* layer and maturation process).
- 6- Drying
- 7- Packaging
- 8- Expedition.

OBJECTIVE

The objective of this study is to evaluate the hygienic quality, the fungal surface development and the organoleptic characteristics of sums during their shelf life.

MATERIALS AND METHODS

MATERIALS:

The 26 sums were obtained from a meat product industry in Barcelona. One half of them were unpacked (batch A) and the other half were packed (batch B).

Day	Batch A		Batch B	
23-March	5 samples (a1,a2,a3,a4,a5)		5 samples (b1,b2,b3,b4,b5)	
7-April	A1	A2	B1	B2
20-April	A3	A4	B3	B4
11-may	A5	A6	B5	B6
25-may	A7	A8	B7	B8

Table 1: Timetable of analysis

stored at room-temperature
stored under cold conditions

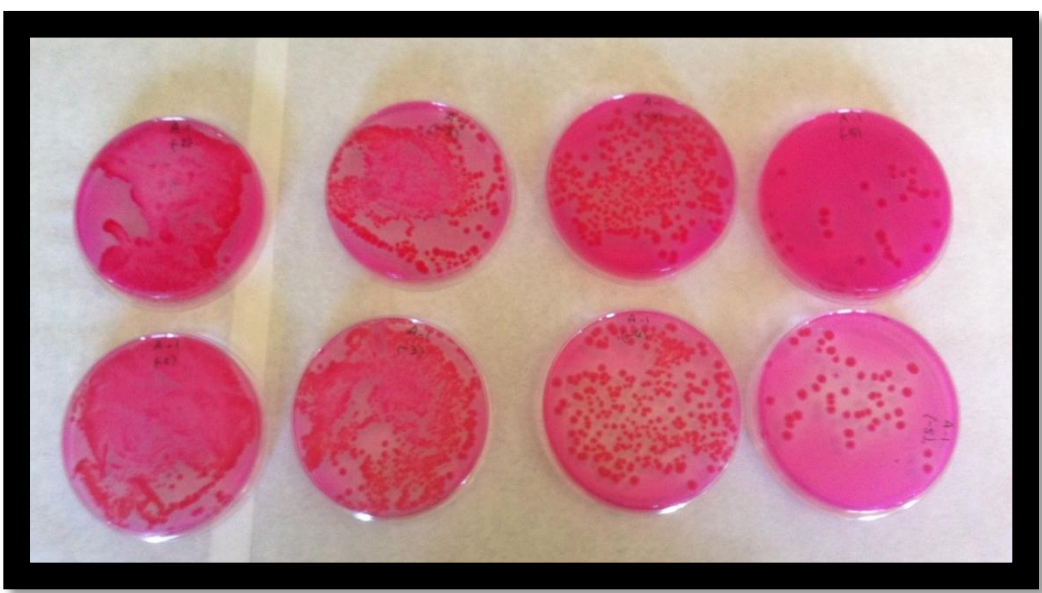
METHODS:

•**Organoleptic analysis:** It was a simple organoleptic analysis in order to evaluate the odour, colour, fungal growth on the surface and defects in its appearance.

•**pH evolution:** To determine the pH of each sample, 5 g of the sample were weighed out and diluted in 50 ml of distilled water. The pH was measured with a pH Micro pH 2000.

•Microbiological analysis:

- *Salmonella* spp.
- *Listeria monocytogenes*
- *Escherichia coli*
- *Clostridium perfringens*
- *Staplylococcus aureus*
- Fungus



RESULTS AND DISCUSSION

		odour	colour	fungal growth	defects in appearance
23/03/2015	a1	N	reddish	N	N
	a2	N	reddish	N	N
	a3	N	reddish	N	N
	a4	N	reddish	N	N
	a5	N	reddish	N	N
	b1	N	reddish	N	N
	b2	N	reddish	N	N
	b3	N	reddish	N	N
	b4	N	reddish	N	N
07/04/2015	A1	N	reddish	N	N
	A2	N	reddish	N	N
	B1	N	reddish	N	N
	B2	N	reddish	N	N
20/04/2015	A3	N	reddish	N	dry
	A4	N	reddish	decrease fungus	dry
	B3	N	reddish-brown	decrease fungus +	soft
	B4	N	reddish	decrease fungus +	N
11/05/2015	A5	N	reddish	decrease fungus	very dry
	A6	N	reddish	decrease fungus +	dry
	B5	ammonia	brown	disappearance fungus	Very soft, emerges the gut
	B6	N	reddish-brown	decrease fungus ++	soft

Table 2: Organoleptic analysis
stored at room-temperature
stored under cold conditions

Table 2 represents organoleptic analysis results.

As shown, main modifications appeared around day 30.

It can be observed that sums packed and stored at room-temperature (B1, B3, B5) have the worst organoleptic characteristics.

Sums B2, B4 and B6, packed and stored under cold conditions, their organoleptic changes have appeared later than the other samples from batch B (at room-temperature).

Surface flora had an upward trend, only at these sums stored at room-temperature during first fifteen days of drying. Also, environment which had higher temperature and relative humidity caused a bigger surface flora growth.

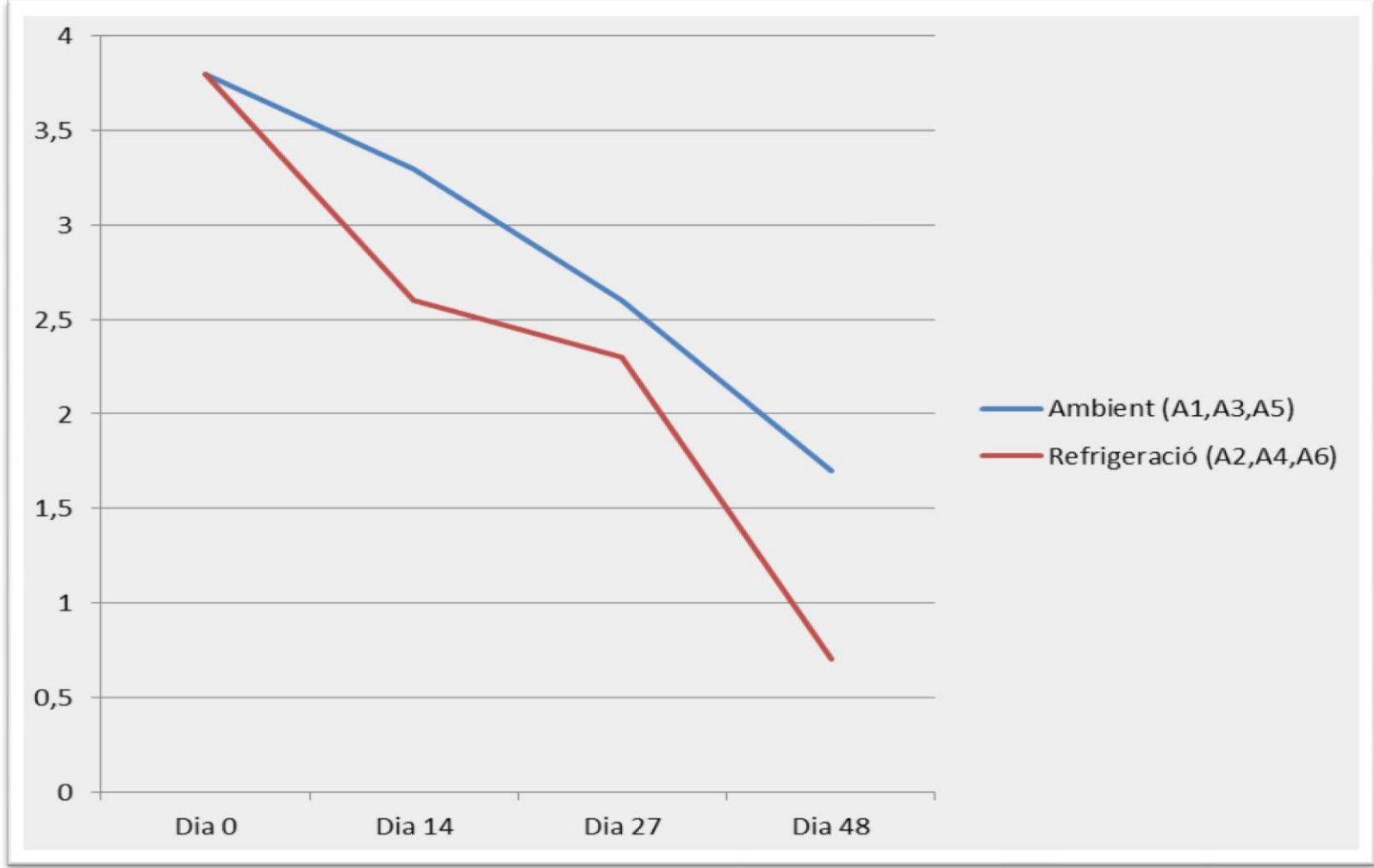
stored at room-temperature
stored under cold conditions

Day	pH Batch A		pH Batch B	
23/03/2015	6,66		6,33	
11/05/2015	A5	6,64	B5	8,08
	A6	6,23	B6	6,41

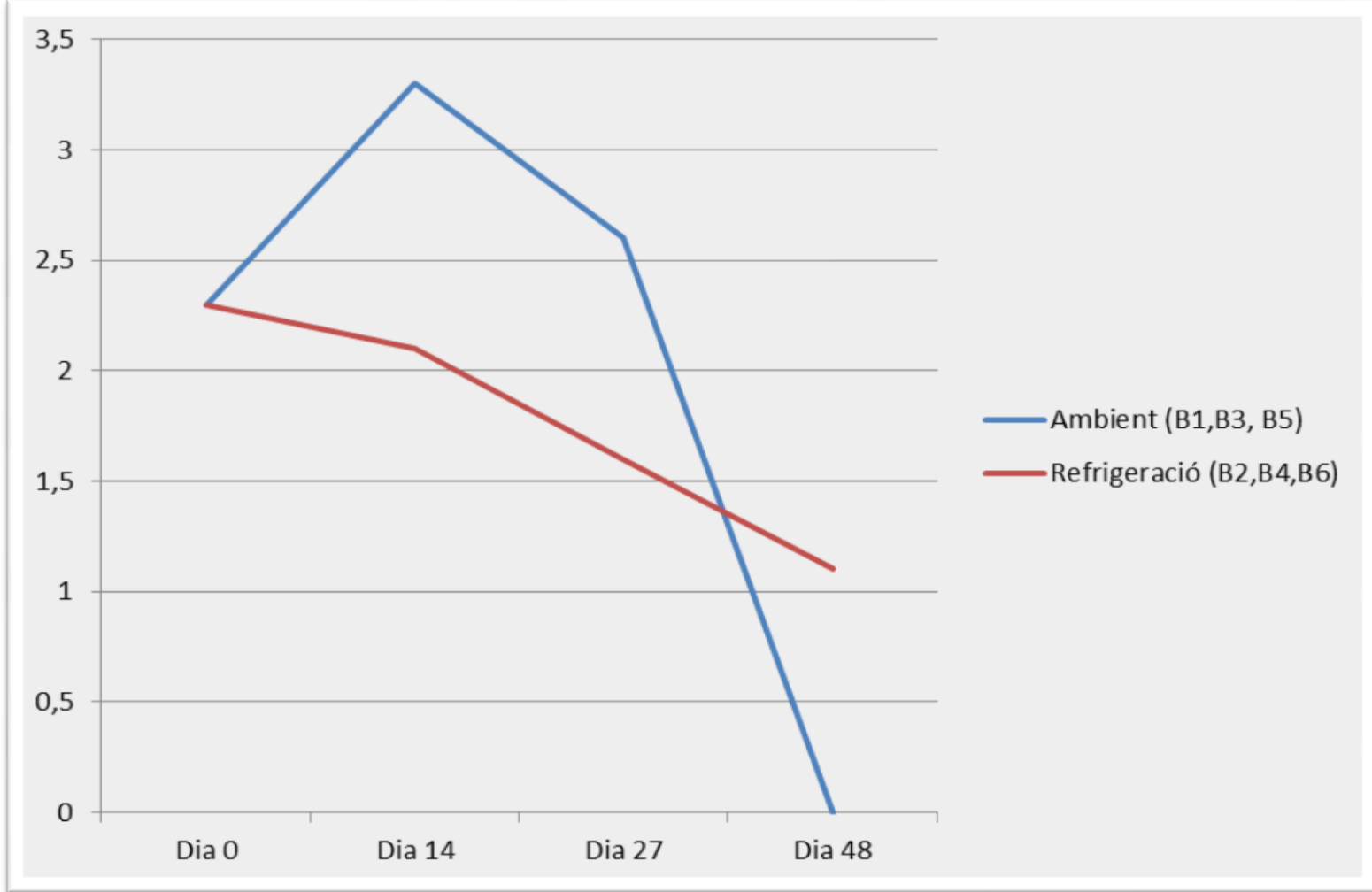
Table 3: Evolution of pH.

		Lot A: No envasat							Lot B: Envasat					
		Salm.	List.	E.coli	S.aureus	C.perf	Fongs(ufc/g)		Salm.	List.	E.coli	S.aureus	C.perf	Fongs(ufc/g)
23/03/2015	a1	A/25g	A/25g	A/g	A/g	A/ml	3,8x10 ⁷	b1	A/25g	A/25g	A/g	A/g	A/ml	2,3x10 ⁷
	a2	A/25g	A/25g	A/g	A/g	A/ml	3,8x10 ⁷	b2	A/25g	A/25g	A/g	A/g	A/ml	2,3x10 ⁷
	a3	A/25g	A/25g	A/g	A/g	A/ml	3,8x10 ⁷	b3	A/25g	A/25g	A/g	A/g	A/ml	2,3x10 ⁷
	a4	A/25g	A/25g	A/g	A/g	A/ml	3,8x10 ⁷	b4	A/25g	A/25g	A/g	A/g	A/ml	2,3x10 ⁷
	a5	A/25g	A/25g	A/g	A/g	A/ml	3,8x10 ⁷	b5	A/25g	A/25g	A/g	A/g	A/ml	2,3x10 ⁷
07/04/2015	A1	A/25g	A/25g	A/g	A/g	A/ml	3,3x10 ⁷	B1	A/25g	A/25g	A/g	A/g	A/ml	3,3x10 ⁷
	A2	A/25g	A/25g	A/g	A/g	A/ml	2,6x10 ⁷	B2	A/25g	A/25g	A/g	A/g	A/ml	2,1x10 ⁷
20/04/2015	A3	A/25g	A/25g	A/g	A/g	A/ml	2,6x10 ⁷	B3	A/25g	A/25g	A/g	A/g	A/ml	2,6x10 ⁷
	A4	A/25g	A/25g	A/g	A/g	A/ml	2,3x10 ⁷	B4	A/25g	A/25g	A/g	A/g	A/ml	1,6x10 ⁷
11/05/2015	A5	A/25g	A/25g	A/g	A/g	A/ml	1,7x10 ⁷	B5	A/25g	A/25g	A/g	A/g	A/ml	0
	A6	A/25g	A/25g	A/g	A/g	A/ml	0,7x10 ⁷	B6	A/25g	A/25g	A/g	A/g	A/ml	1,1x10 ⁷

Table 4: Microbiological analysis



Graphic 1: unpacked samples



Graphic 2: packed samples

CONCLUSION

-Sums could be considered as products with an acceptable microbiological quality.

-In samples checked, any of pathogen microorganisms have been detected.

-Surface culture addition during the production of these meat products helps to control the presence of undesirable microbiota.

-Results of analyses in this study show that fungal contamination different from *Penicillium chrysogenum* has not been detected.

-This study demonstrates that the packed and stored under cold conditions sum has the best organoleptic characteristic during a longer period of time, with the same firmness and favourable conditions of surface flora.

-Packed and stored at room-temperature sum is not recommended, although the firmness of the product would not change with these characteristics.