

PORTUGUESE TRADITIONAL SAUSAGE PRODUCTS: COMPARISON OF SOME CHARACTERISTICS

*Barreto, A. S.; *Fernandes, M. J.; * Ferreira, M. C.; *Fraqueza, M. J.; *Ouakinin, J. S.; * Ribeiro, A. M.

** Elias, M.; **Marinho, A.

* Faculdade de Medicina Veterinária - CIISA - Universidade Técnica de Lisboa

Rua Gomes Freire, 1169-014 Lisboa Codex - Portugal

** Universidade de Évora. Departamento de Fitotecnia - Apart. 94 - 7001 Évora Codex

BACKGROUND:

The Iberian pig is the only autochthonous swine race with an effective expression in Portugal.

It has its habitat in the south province of Portugal, Alentejo, where the holm-oak (*Quercus rotundifolia*) and the cork-oak (*Quercus suber*) grove is predominant. The fruits of these trees are the feeding of the pig from Alentejo in the greatest part of its life cycle, establishing this way an ecological and nutritional adequate system. From a productive point of view, the pig from Alentejo is an adipous animal, with late growth and low meat yield. As the production of meat is limited in time, it comes from the past, a long tradition of several artesanal based meat products as a way to preserve the meat.

Since those characteristics, even today, the greatest part of the production is used for meat processed products. These products present a very good quality and an high economic value. The quality of the processed products is usually related with its biological pattern characteristics of muscular and adipous tissues; the muscular characteristics seeming to be firstly related with the genotype while the adipous characteristics are attributed to the feeding, specially in the last part of animal fattening in oak grove.

OBJECTIVES:

Aiming the impulse of production, processing and marketing of the pig from Alentejo, according the legal applications for "Protected Geographical Indication" traditional products (EEC Regulations 2081/92 and 2082/92), the Faculty of Veterinary Medicine and the University of Évora (Alentejo), have been conducting research work, to establish the chemical, microbiological and sensorial characteristics, on several processed products.

These characteristics have been evaluated at times 3, 6 and 9 months after processing, under the following conditions of storage: vacuum and modified atmosphere (MAP) packaging (composition of atmosphere: 20% of CO₂ and 80% of N₂).

The products we present in this work are "Paio" and "Chouriço Grosso". The results concern the study of a physical and a chemical index of stability: pH and Total Basic Volatil Nitrogen (TBVN), according to the microbiological and sensorial characteristics evaluated at the same times and conditions of preservation.

METHODS:

Products Manufacture:

In the Table 1 are indicated the main operations of the manufacture of the two traditional products.

Analytical Methods:

Microbiological analysis included standard count of mesophylic total aerobes, psicrotrophics bacterias, coliforms (30°C), *Lactobacillus*, *Micrococcus*, fungi (moulds and yeasts).

pH and Total Basic Volatile Nitrogen (TBVN) have been evaluated by the reference methods of the Portuguese Standards.

The sensorial analysis is a descriptive quantitative one, each panel having fourteen persons. The results have been based on a hedonic scale from 0-100. The attributes pointed to the global evaluation are the colour intensity, the intramuscular fat, the smell intensity, the tenderness, the fibrousness, the succulence, the taste intensity, the salt intensity.

RESULTS AND DISCUSSION:

The results presented are the media of the assays, in the above mentioned different conditions of storage. The samples "0" are referent to the finished product at time 0, i.e. before storage. At time 0, the *Lactobacillus* and *Micrococcus* counting shows the characteristic values of ripened products. The other microbiological parameters show a good stability of the product along all the time of the study, for the two types of packaging (Table 2).

Also, during the whole study, the variation of pH values are not significant. For TBVN, the values founded, although higher than those usually described (Table 3), did not affected the sensorial characteristics, which had been evaluated as the typical for this type of products (Table 4).

CONCLUSIONS:

The vacuum and MAP packed samples showed a good stability during the time of the study (9 months), without variation of the sensorial characteristics.

We intend to proceed this work, until to 12 months in the same conditions of storage, to evaluate the shelf-life.

PERTINENT LITERATURE:

- Neves, J.A.F. "Influência da Engorda em Montanha sobre as Características Bioquímicas e Tecnológicas da Matéria Prima e do Presunto Curado de Porco Alentejano", Dissertação apresentada à Universidade de Évora para obtenção do grau de Doutor em Ciências Agrárias, Évora 1998.

- A.O.A.C. "Official Methods of Analysis" 16 th. Ed., 1995.

- Mossel, D.A.A.; Moreno Garcia, B. "Microbiologia de los Alimentos" Ed. Acribia, S.A, Zaragoza, España, 1985.

DATA:
Table 1:

Operations	Chouriço Grosso	Paio
Meats coarse grinding	bacon and collar in $\pm$ 4cm pieces	bacon and collar in $\pm$ 5cm pieces
Blending+seasoning	water, salt, salted red pimienta paste, garlic paste	water, salt, salted red pimienta paste, garlic paste
Ripening: Time Temperature RH	3 days 0-5°C 90-95%	4 days 0-5°C 90-95%
Casing	pork colon	pork <i>caecum</i>
Tie	cotton file	cotton file
Curing: Type Time	cold (7-10°C) 15 days; and ulterior period of 45 days at room temperature	cold (7-10°C) 30 days; and ulterior period of 60 days at room temperature

Table 2:

Product	Chouriço Grosso							Paio						
Type of packaging	Vacuum			M.A.P.				Vacuum				M.A.P.		
Time of storage (months)	0	3	6	9	3	6	9	0	3	6	9	3	6	9
Mesophilic total aerobes (log c.f.u./g)	6.19	3.74	3.31	3.28	4.18	4.60	4.55	6.37	4.40	3.65	3.99	4.47	3.87	4.43
Psicrotrophics (log c.f.u./g)	2.46	0.50	0.00	0.00	0.00	0.00	0.00	3.32	1.18	1.10	0.00	0.00	0.00	0.00
<i>Lactobacillus</i> (log c.f.u./g)	6.16	4.52	3.98	1.50	3.58	2.06	1.50	5.48	4.52	2.23	4.34	5.24	2.10	3.63
<i>Micrococcus</i> (log c.f.u./g)	4.13	5.24	2.80	5.37	5.17	3.59	6.36	5.08	5.22	4.19	5.62	5.46	2.87	5.38
Coliforms at 30°C (log c.f.u./g)	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Moulds (log c.f.u./g)	0.00	0.00	2.85	0.85	1.04	1.10	0.00	1.33	0.54	3.54	0.50	0.00	2.10	0.67
Yeasts (log c.f.u./g)	3.56	1.28	4.59	1.85	2.94	1.17	0.00	4.78	0.74	1.10	0.97	0.80	1.00	2.48

Table 3:

Product	Chouriço Grosso							Paio						
Type of packaging	Vacuum			M.A.P.				Vacuum				M.A.P.		
Time of storage (months)	0	3	6	9	3	6	9	0	3	6	9	3	6	9
pH	5.43	6.05	5.65	5.8	6.18	5.91	5.34	5.47	6.02	5.66	5.69	6.01	5.89	5.53
TBVN (mg NH ₃ /100g)	92.1	167.1	154.8	130.1	182.9	189.3	160.5	73.5	186.3	169.9	189.5	141.9	169.9	157.2

Table 4:

Product	Chouriço Grosso							Paio						
Type of packaging	Vacuum			M.A.P.				Vacuum				M.A.P.		
Time of storage (months)	0	3	6	9	3	6	9	0	3	6	9	3	6	9
Colour	63.1	66.3	61.6	70.1	66.0	67.6	64.7	65.9	69.2	70.2	71.2	70.6	75.6	81.4
Strange colour	2.9	5.2	3.3	3.7	5.7	4.2	3.5	3.0	3.8	1.6	1.6	4.6	3.8	2.3
Odour	61.9	58.5	60.6	60.8	58.3	60.9	60.1	65.8	61.0	61.0	65.6	63.8	64.0	60.6
Strange odour	4.0	4.9	9.3	5.4	4.2	1.0	3.7	2.8	2.4	2.2	3.7	1.8	6.6	0.8
Tenderness	62.5	60.9	61.0	63.7	60.0	61.6	65.7	64.8	62.8	64.7	63.3	62.4	63.6	64.0
Fibrousness	58.9	59.1	59.8	59.4	59.0	59.5	63.3	61.0	62.5	64.4	62.4	60.1	63.6	63.6
Succulence	65.2	62.4	59.3	64.5	62.8	60.3	67.4	68.9	64.7	64.5	64.8	64.3	63.7	65.5
Taste	64.9	63.4	63.2	66.9	63.7	68.0	68.3	69.5	66.8	64.3	70.8	67.5	64.4	70.1
Strange taste	2.8	8.6	11.5	9.3	6.7	5.5	7.0	4.5	4.6	2.4	7.4	4.0	6.3	7.7
Salty taste	57.3	59.1	60.5	64.2	61.4	57.1	61.9	58.5	59.8	59.2	61.7	61.1	55.7	60.0
Global appreciation	59.1	57.1	50.3	55.7	57.7	56.6	58.8	63.7	59.8	64.6	61.3	61.3	56.4	63.3