

The influence of starter cultures on texture and sensory properties of “Paio”, a Portuguese dry-cured sausage.

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Objectives

The main goal of the present work is to evaluate the hypothetical advantage of the use of two commercial starter cultures in the sensory and rheological characteristics of “Paio do Alentejo”.

Conclusions

In the studied factory and product and considering sensorial and rheological aspects, the use of both starter cultures studied seems to be unnecessary. The only relevant advantage for the use of starter S2 was to improve cohesiveness in “Paio do Alentejo”. The needlessness of these starters is probably due to high quality of “Paio do Alentejo” studied.

Material and Methods

“Paio do Alentejo” is a traditional Portuguese dry-cured sausage. Using meat from Alentejano pig breed female 24 month aged in a traditional meat plant. Three batches were inoculated
C - Control batch, not inoculated.
S1 - Starter composed by *Lactobacillus* spp., *Micrococcaceae* and yeasts.
S2 - Starter composed by *Lactobacillus sakei* and *Staphylococcus xylosum*.

A trained sensory panel of 12 experts was used to analyze the samples. Samples were replicated five times. The descriptive analysis of the samples was obtained through a structured scale considering the attributes

- colour intensity
- aroma intensity
- tenderness
- succulence
- flavor intensity
- salt perception
- global evaluation
- off colour
- off aroma
- fibrousness
- off flavor

A Texture Profile Analysis (TPA) was performed using a cylindrical flat-ended plunger (area 1cm²) using a Stable Micro System TA-Hdi. Samples were previously sliced with 1cm thick, obtaining circular samples with 4-5cm diameter. Slices were compressed twice with two consecutive cycles of 50% compression with 5s between cycles, and the plunger was driven at a constant speed of 1 mm/s (Honikel (1997); Caine *et al.* (2003) and Martinez *et al.* (2004)). Curves force by time were recorded, in order to calculate several parameters.

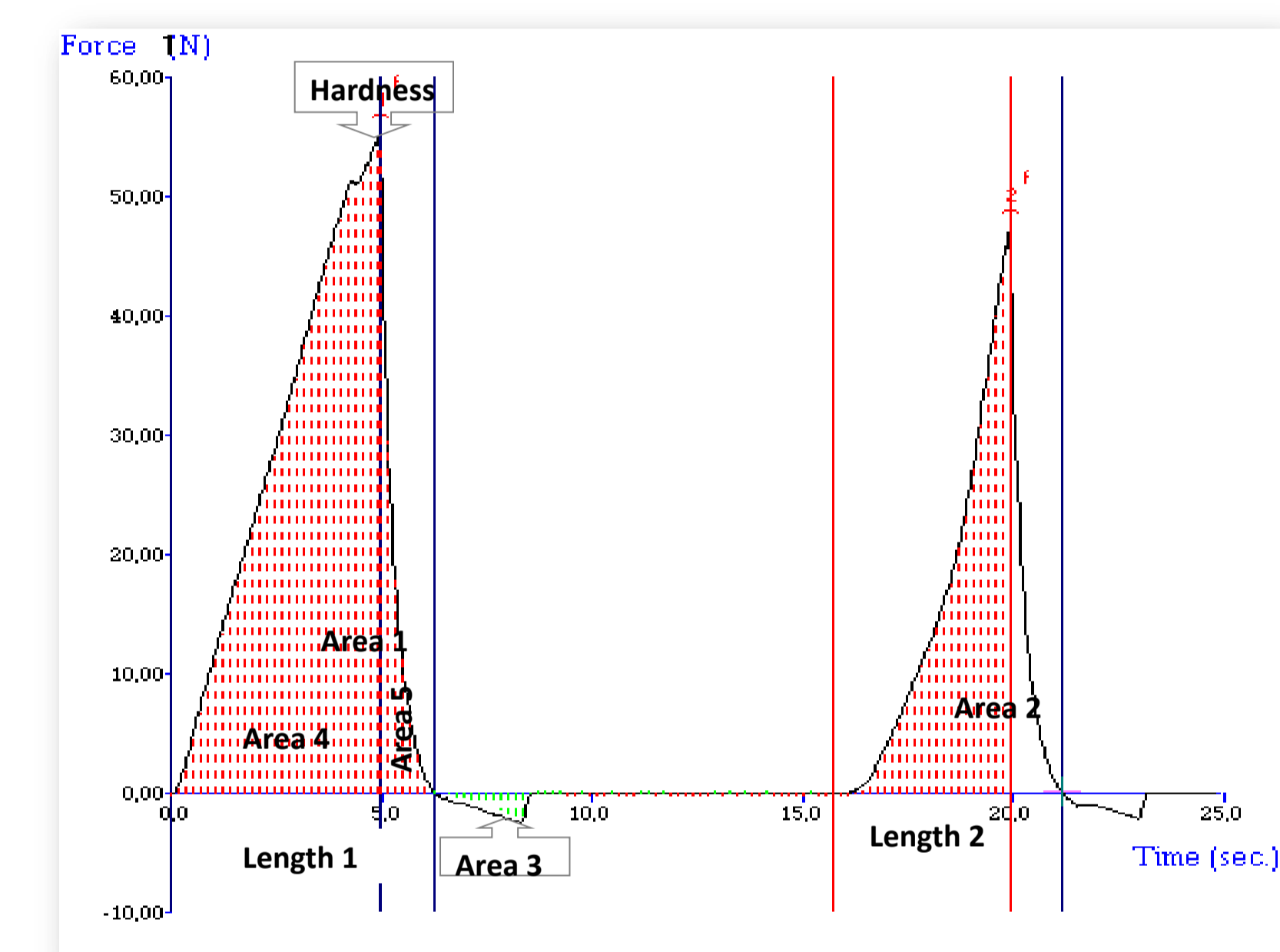


Figure 1. TPA graphic and obtained parameters

Results & Discussion

Inoculation Modality	Colour	Off Colour	Aroma	Off Aroma	Hardness	Succulence	Flavour	Off Flavour	Salt Perception	Global Evaluation
C	66.8 ±12.2	0,0	69.7 ±10.0	0,0	55.4 ±8.8	68.6 ±8.0	72.4 ±9.2	0,0	56.1 ±10.7	73.2 ±7.2
S1	71.1 ±14.1	0,0	71.0 ±11.2	0,0	54.1 ±5.2	67.1 ±9.9	73.5 ±9.9	0,0	58.1 ±9.7	72.9 ±10.4
S2	69.9 ±15.0	0,0	72.0 ±11.4	0,0	51.4 ±8.4	71.9 ±8.5	73.1 ±10.1	0,0	59.7 ±10.8	71.8 ±10.6

Table 1. Mean values and Standard Deviation for sensory variables considering Inoculation modalities control (C), S1 and S2.

Inoculation Modality	Hardness	Adhesiveness	Springness	Cohesiveness	Guminess	Resilience	Chewiness
C	45.07 ±12.27	-2.61 ±1.10	0.85 ±0.06	4.31 ±0.45	28.59 ±8.02	0.17 ±0.03	24.58 ±7.84
S1	41.34 ±8.59	-3.46 ±1.09	0.88 ±0.07	4.75 ±0.34	26.59 ±4.96	0.16 ±0.02	23.47 ±5.06
S2	41.99 ±12.96	-3.24 ±1.39	0.84 ±0.06	4.63 ±0.54	26.41 ±6.85	0.16 ±0.03	22.26 ±6.52

Table 2. Mean values and Standard Deviation for TPA variables considering Inoculation modalities control (C), S1 and S2.

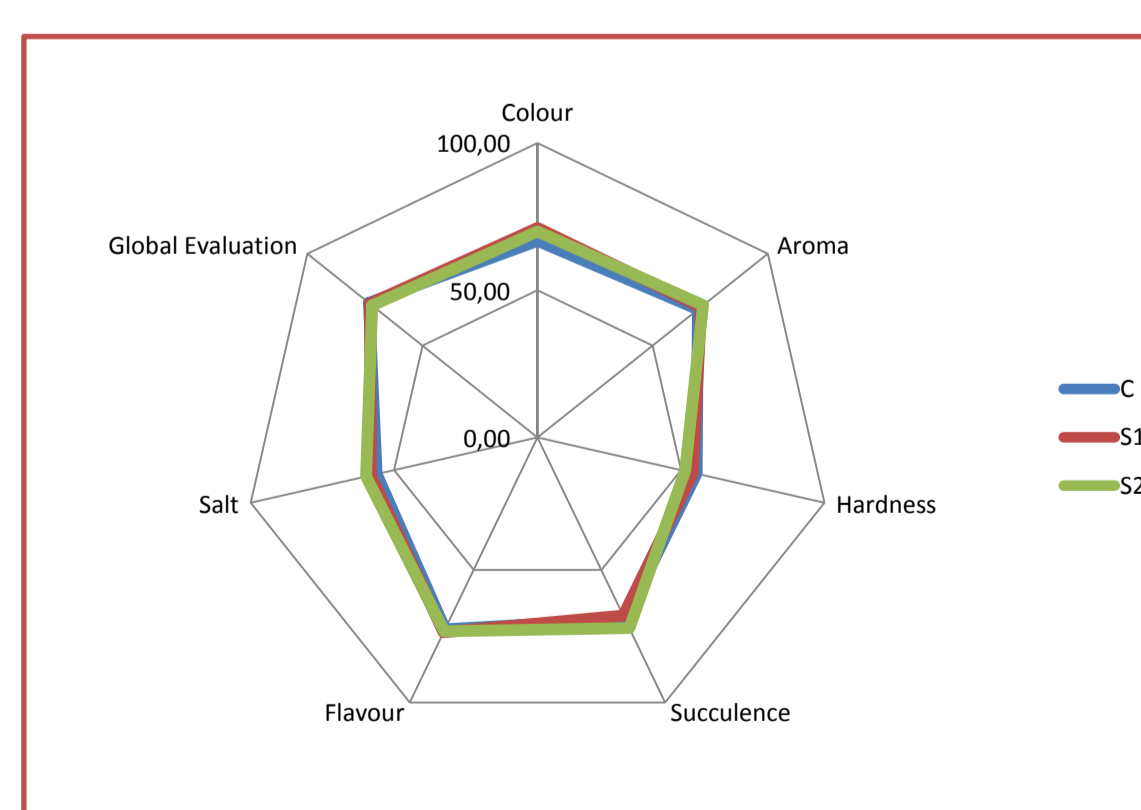


Figure 2. Sensory evaluation considering different attributes

ANOVA for sensorial results evidences no significant differences for any attribute (Table 1). Although the widespread use of starters cultures in sausages with the goal to promote colour, aroma and flavours, in the present study that presupposition wasn't validated, probably due to high quality of dry-cured “Paio Alentejano”.

According to TPA ANOVA results, the only significant difference was obtained for cohesiveness ($p < 0,05$), which was higher in S2 batch (Table 2) when comparing with batch control (C). In TPA analysis, the results obtained for both inoculated batches were very similar.

Considering PCA analysis (Figure 3), factor 1 explains 31% of variance of the variables and establish relation between succulence attribute (sensorial evaluation) and adhesiveness (obtained from TPA). This fact could be related to a higher attractive forces between the surface of the “Paio” and judges mouth (palate and teeth). A very close location of hardness measured by sensorial evaluation and by TPA hardness was noticeable.

The factor 2 explains 20.02% of the results and cohesiveness obtained through TPA is related with succulence from sensorial evaluation.

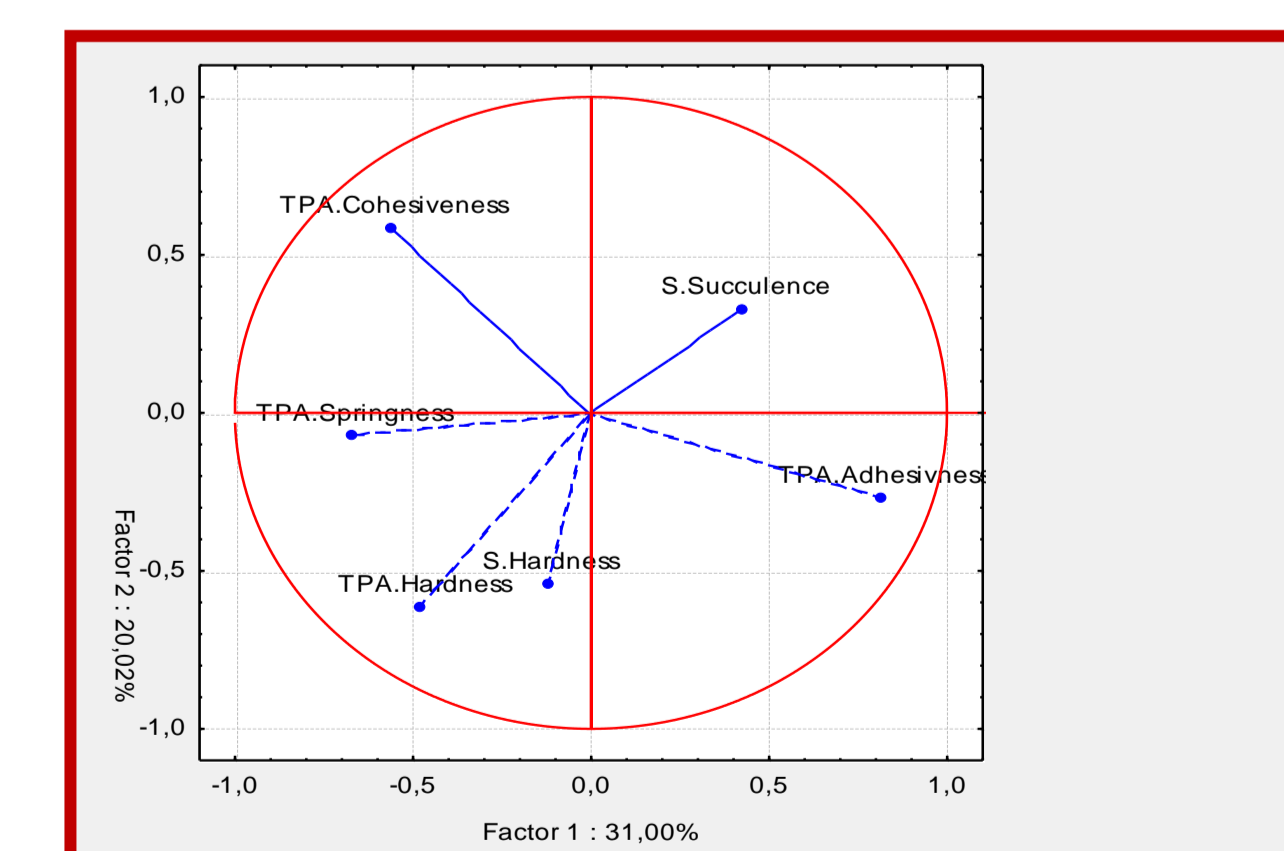


Figure 3. Principal Component Analysis. Projection of the variables on the factor plane considering 2 factors.

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