

African Food Tradition rEvisited by Research
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Abstract

The goal of this work consists of adapting local products from Kitoza to the expectations, tastes and regulatory requirements of European markets. To meet the European markets requirements, different strategies can be applied, one consists to improve the storage and the shelf life by different packaging (under vacuum, in controlled atmosphere...) and by adding starter culture for biopreservation. The Kitoza manufacture with pork meat and inoculated with starter culture can be stored at 4°C under vacuum up to 35 days without microbial problem and the shelf life of 25 days was validated. While for the pork or beef samples not inoculated the storage up to 35 days and the shelf life of 25 days were not validated. These results underlined the interest of starter culture for biopreservation.

1. Introduction

The goal of this work consists in adapting local products from Kitoza to the expectations, tastes and regulatory requirements of European markets. To meet the European markets requirements:

- moderate smoking has to be done to avoid high levels of HAP which are toxics
- shelf life has to be increased by different packaging (under vacuum, in controlled atmosphere..) and by adding starter culture for biopreservation of Kitoza.

The manufacturing of products from Kitoza for the European market will be done with meats from European origin. The indigenous technological bacteria isolated and characterized in deliverables 3.2.2.3 and 3.3.3, are certainly well adapted to the native products but for the European ones we did not know. Thus we decide, as the technological bacteria can play a role in the biopreservation, to test a commercial starter culture developed for this purpose and that resists to smoking. This commercial starter culture (B-LC-77) was composed of a mixture of lactic acid bacteria (*Pediococcus acidilactici*) and a *Staphylococcus carnosus*.

In this deliverable (D3.3.2), we report only results concerning the impact of starter culture for biopreservation of Kitoza. The impact of other factors (smoking, curing brine...) will be reported in the deliverable (D3.3.4).

2. Samples analysis: methodology

Kitoza was manufactured from pork meat according recipe and flow diagram established by ADIV from the data from Madagascar (Figure 1, more details will be given in Deliverable 3.3.4). But for the adaptation to the European market, first the effect of the addition of nitrate and commercial starter cultures (BLC 77 (CH Hansen) (*P. acidilactici*, *S. carnosus*) was evaluated in pork samples under vacuum packaging and stored at 4°C (Table 1) and secondly the shelf life validation of the inoculated sample was validated.

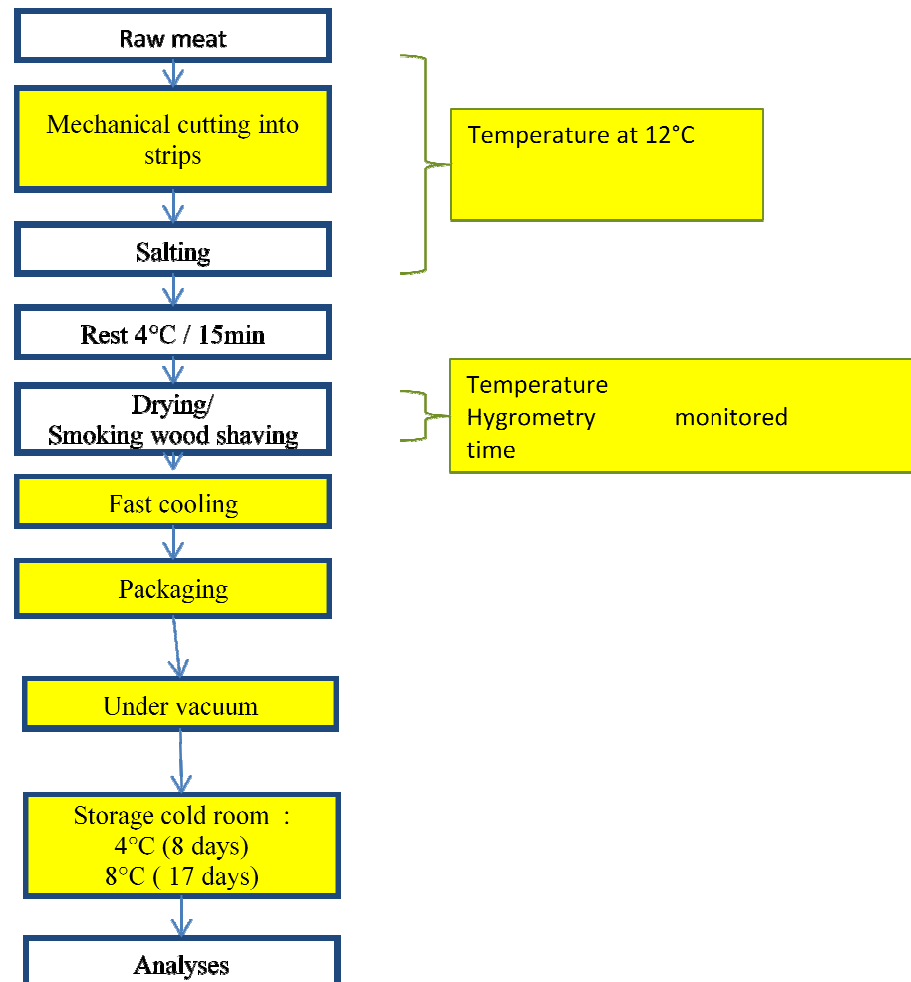


Figure 1: Process Flow diagram for manufacturing Kitoza

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	Pork control	Pork + starter
Nitrite salt	15 g/kg	15 g/kg
4 spices	2 g/kg	2 g/kg
garlic	4 g/kg	4 g/kg
Nitrate	0,15g/kg	0,15g/kg
Biopreservation starters P. acidilactici S. carnosus	Ø	Log CFU /g

Table 1: Ingredients used to manufacture the pork sample Kitoza

For the validation of the shelf life, two samples were prepared: one with pork with starter as described above (Table 1) and another with beef (salt: 15g/kg, ginger powder: 5 g/kg, sunflower oil: 41g/kg) without any starter. The samples were stored under vacuum at 4°C up to 8 days and then the temperature was increased to 8°C up to 25 days.

3. Results and discussion

For the control sample, pork without starter, the total counts (FAM) were in accordance with standards and the ratio FAM/LAB after 21 days of storage at 4°C is under 100 (defined by the Federation des Entreprises du Commerce et de la Distribution in 2009, FCD) but this ratio was not anymore in accordance with the FCD criteria after 35 days of storage at 4°C (Figure 2).

While for the sample inoculated with starter, the ratio FAM/LAB after 35 days of storage under vacuum at 4°C was still in accordance with the FCD criteria (Figure 2).

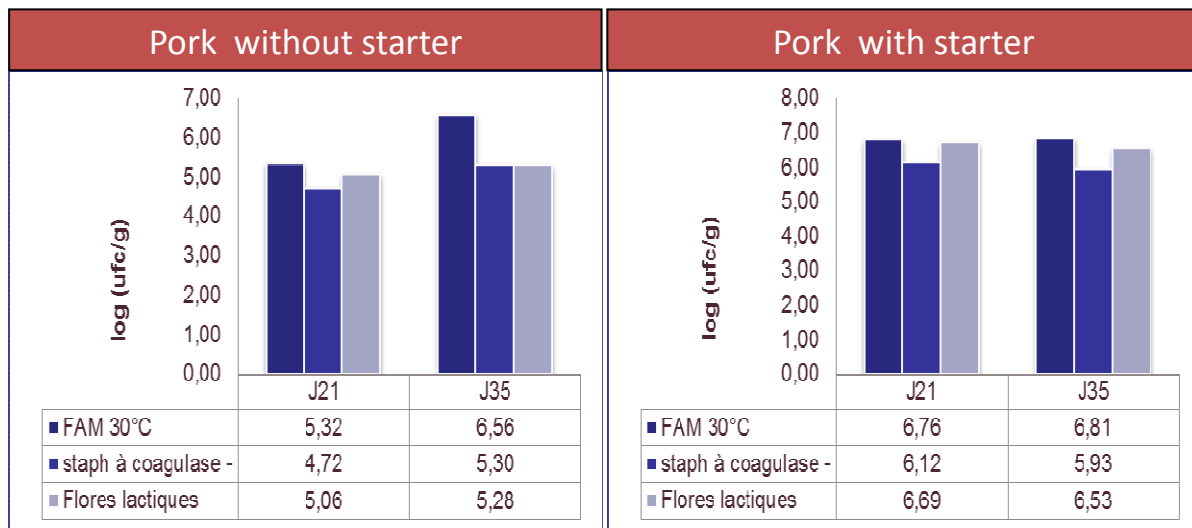


Figure 2: Effect of the starter on the microbiology of the products.

Furthermore the taste of the biopreserved sample was not different from the control one. No pathogens were detected in both samples.

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For, the biopreserved pork sample, an increase of total counts (FAM) and LAB was noticed at 8°C, but the ratio FAM/LAB after 25 days of storage at 4°C then at 8°C was under 100 (Figure 3). No pathogens were detected. Thus the shelf-life of this sample was validated.

For the beef sample, the total count (FAM) after 25 days was 8.4 log CFU/g (Figure 3). For this product not inoculated by starter, the total count should be inferior or equal to 6 log CFU/g (FCD criteria). Thus the shelf life at 25 days of this product was not validated.

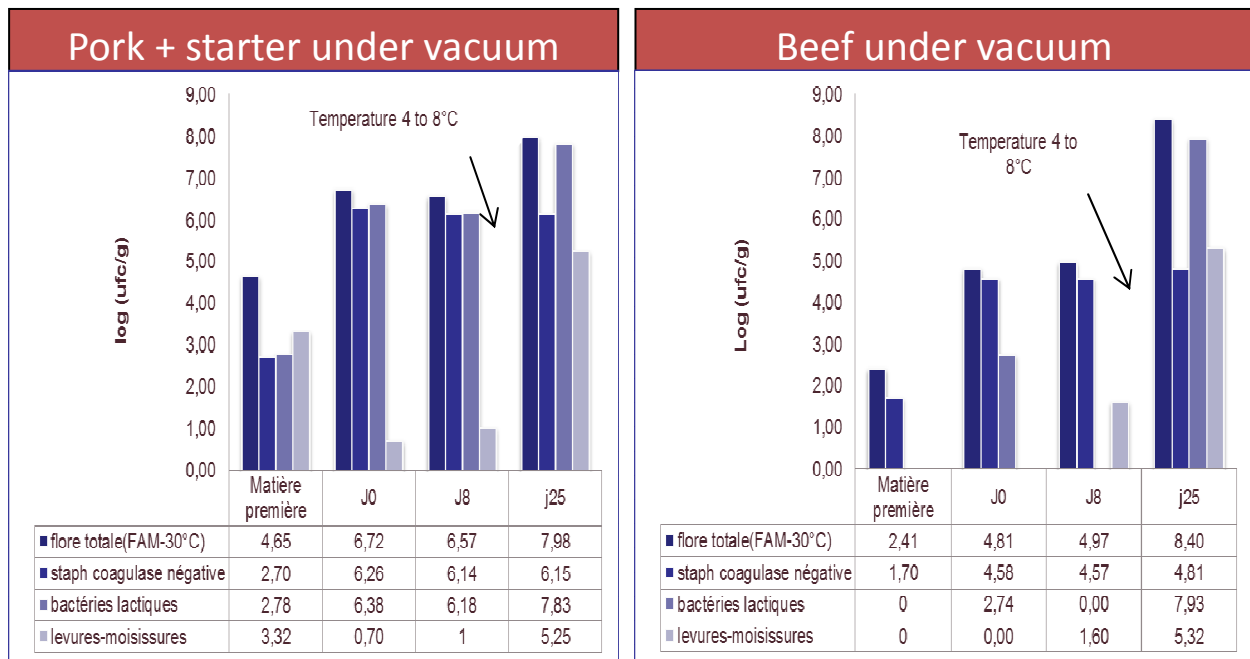


Figure 3: Shelf life validation in two products: one with starter and the other without.

4. Conclusion

The Kitoza manufacture with pork meat and inoculated with starter culture can be stored at 4°C under vacuum up to 35 days without microbial problem and the shelf life of 25 days was validated. While for the pork or beef samples not inoculated the storage up to 35 days and the shelf life of 25 days were not validated. These results underlined the interest of starter culture for biopreservation.