

# Application of autochthonous lactic acid bacteria as starter cultures for ewe's milk cheese production

S Gomes<sup>1</sup>, N Alvarenga<sup>1,2</sup>, MP Esteves<sup>1</sup> APL Martins<sup>1,2</sup>, H Araújo-Rodrigues<sup>3</sup>, J Soares<sup>3</sup>, M Pintado<sup>3</sup>, P Serol<sup>4</sup>, C Lampreia<sup>4</sup>, M Floro<sup>4</sup>, M Costa<sup>4</sup>, MJ Carvalho<sup>4</sup>, J Dias<sup>2,4</sup>, O Amaral<sup>2,4</sup>, A Macedo<sup>4</sup>, MT Santos<sup>4</sup>

<sup>1</sup>UTI-INIAV, Portugal, <sup>2</sup>GeoBioTec - FCT, U.Nova Lisboa, Portugal, <sup>3</sup>CBQF-ESB, Universidade Católica Portuguesa/Porto,

Portugal; <sup>4</sup>ESA-IPBeja, Portugal

[nuno.alvarenga@iniav.pt](mailto:nuno.alvarenga@iniav.pt); [t.santos@ipbeja.pt](mailto:t.santos@ipbeja.pt)

## Introduction

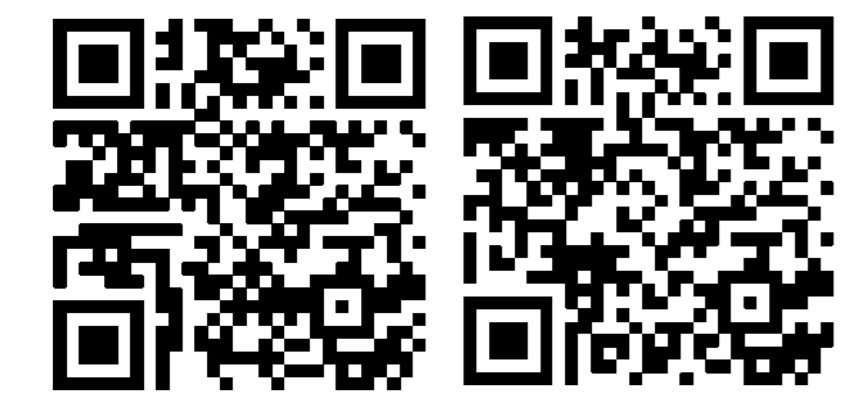
2018 - In first tasks of SerpaFlora it was possible to establish the main strains of lactic bacteria involved in Serpa cheese ripening

<https://doi.org/10.1111/1750-3841.14141>



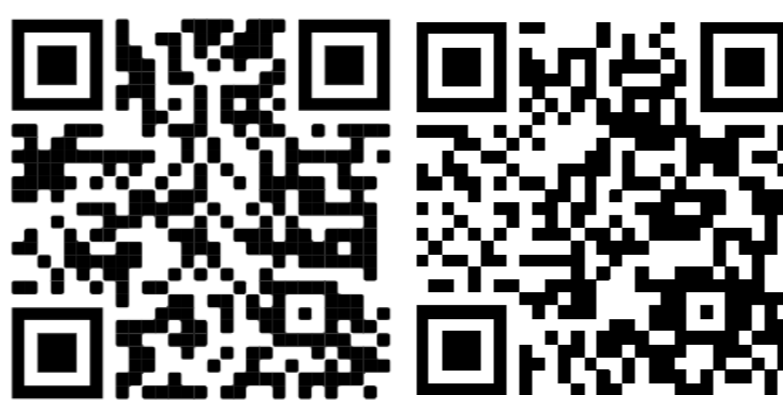
2017 and 2020 - Serpa cheese is traditional manufacturing process use of raw ewe's milk, without any commercial starter

<https://doi.org/10.1016/j.jfoodmicro.2017.09.013>  
<https://doi.org/10.1016/j.idairy.2019.104561>



2019 and 2021 - This bacteria were characterized in terms of their technological, probiotic and antimicrobial properties

<https://doi.org/10.1016/j.lwt.2021.112079>  
<https://doi.org/10.1016/j.lwt.2019.108388>



2022 - Organoleptic Chemical Markers of Serpa PDO Cheese Specificity

<https://doi.org/10.3390/foods11131898>



**Objective**  
Use an autochthonous inoculum (SF5C) consisting of four lactic acid bacteria isolated from raw sheep's milk or Serpa PDO cheese

The introduction of this innovative practice in traditional portuguese cheese factories, will promote the processes efficiency and the quality of final product



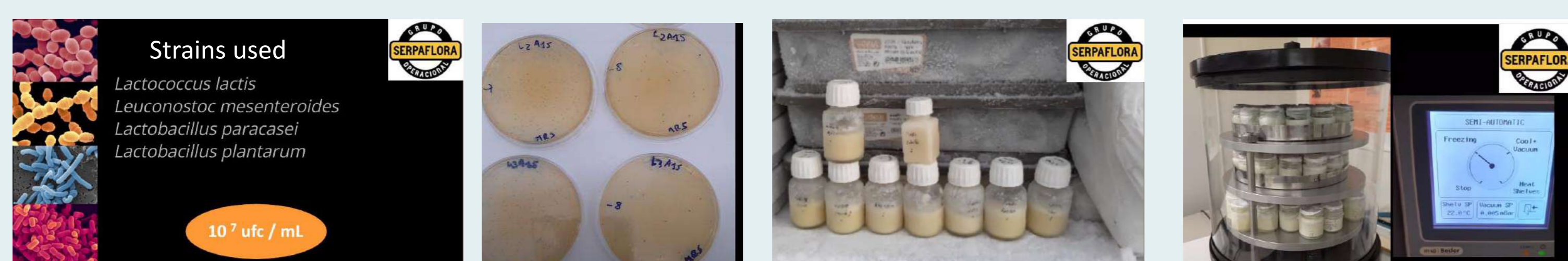
## Conclusions

- The physico-chemical and microbiological parameters were similar to those obtained in previous works for this type of cheese (Fig. 1)
- The hedonic sensory testing point to a good acceptance of cheeses with "SF5C Test Inoculum": the batches with added inoculum (L2, L3 and L4) reached a higher score than batch without inoculum (L1), highlighted to the batch L3 (4% inoculum added to raw milk) (Fig. 2)
- These results seem to indicate that the autochthonous inoculum "SF5C Test Inoculum" can be classified as "Valor Inoculum" within the scope of GO SERPAFLORA project

## Materials and Methods

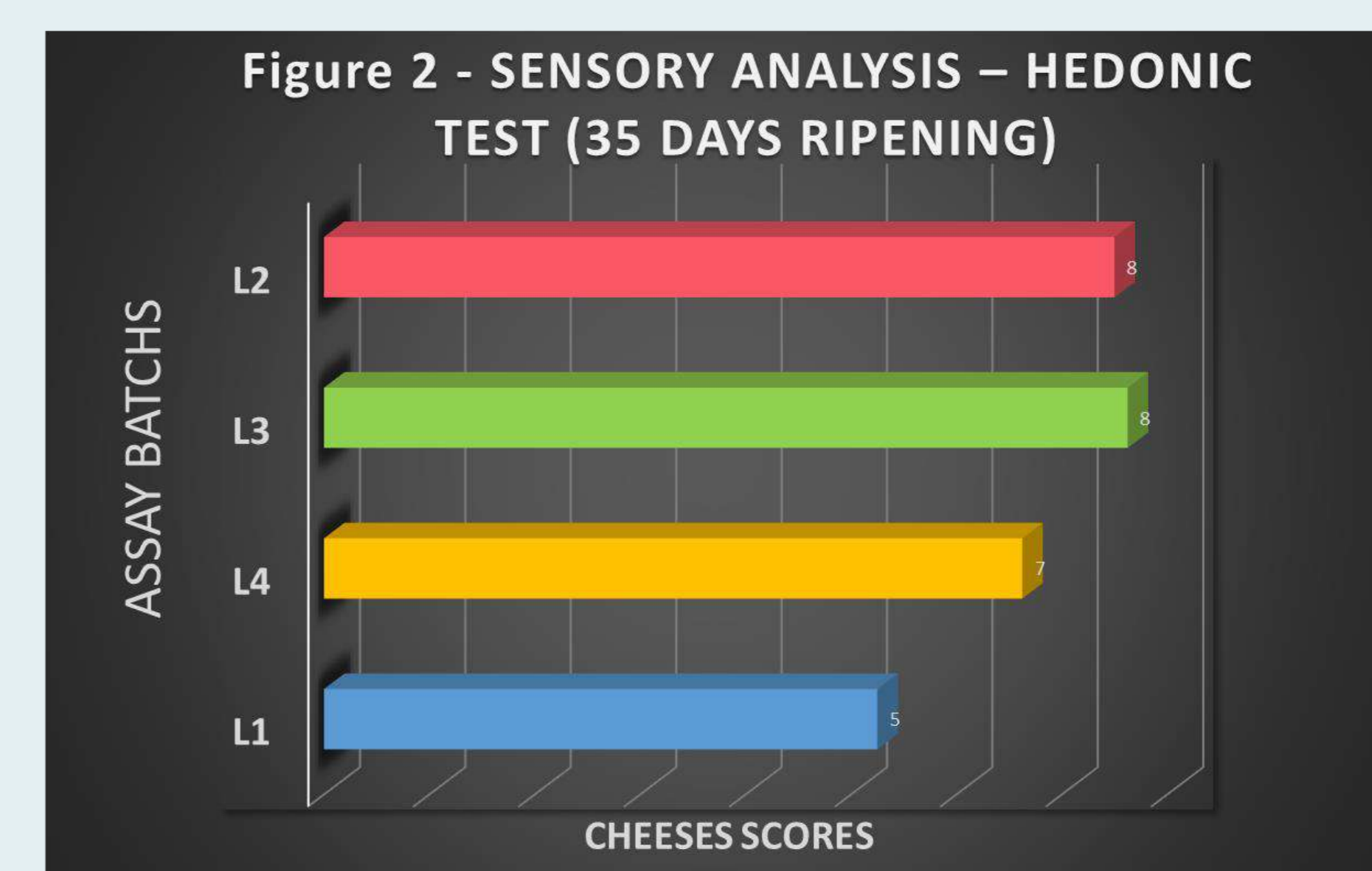
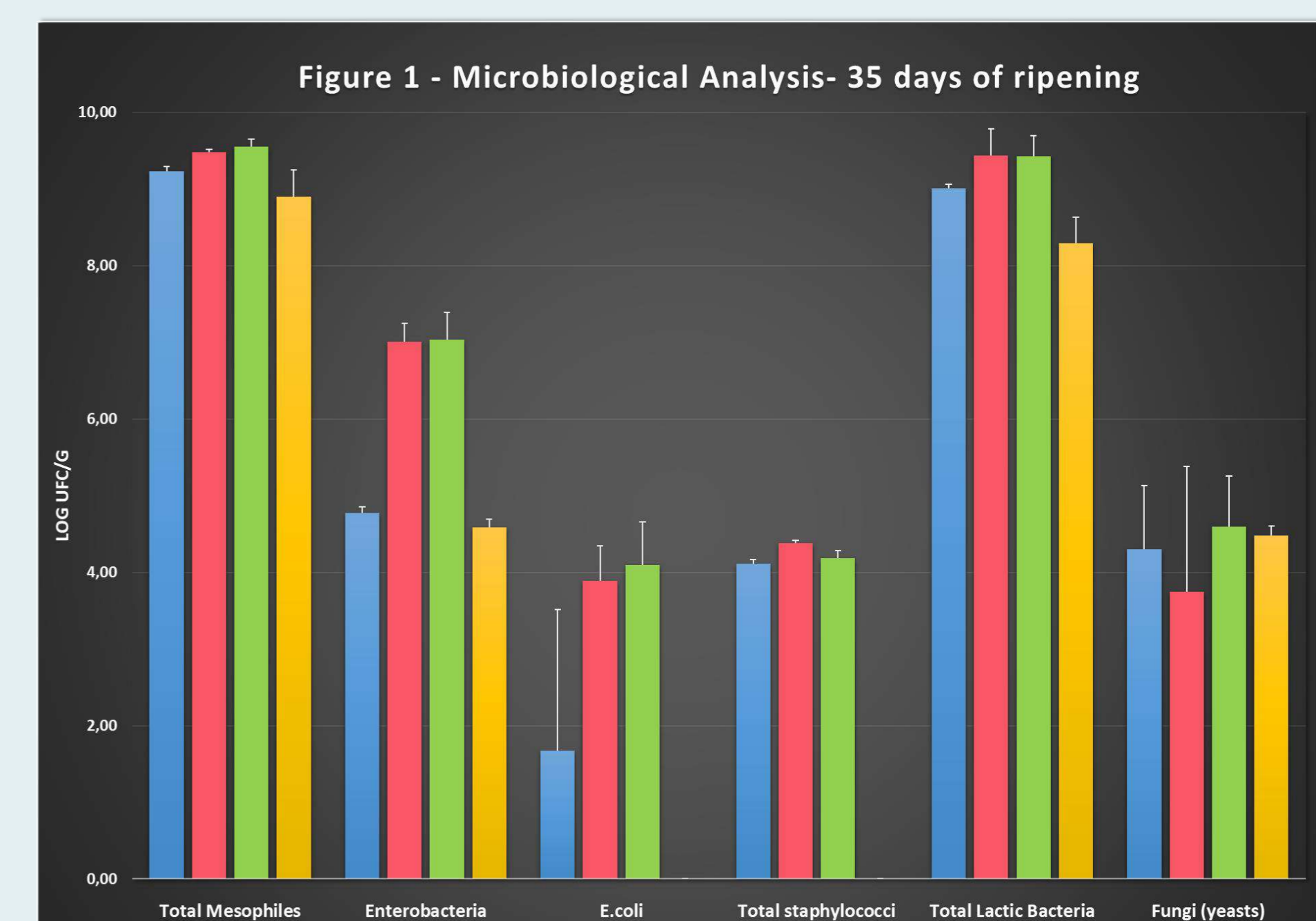
- A pilot scale trial was developed using an autochthonous mixed inoculum (SF5C Test Inoculum) composed of the autochthonous strains *Lactococcus lactis* LLA17, *Lactobacillus paracasei* A2Lb1, *Lactobacillus plantarum* G1Lb5 e *Leuconostoc mesenteroides* LMA45.

- In the first batch (L1), used as the control group, only raw milk was used; in the second batch (L2), 2% inoculum was added to the raw milk, in the third batch (L3), 4% inoculum was added to the raw milk, and in the fourth batch (L4) 4% inoculum was added to pasteurized milk. The cheeses were evaluated (in triplicate), immediately after production (0 days) and after 15 and 35 days of ripening: physicochemical (pH, acidity, adhesiveness and hardness), microbiological (total mesophiles, enterobacteria, lactic bacteria - LAB and fungi) and sensory properties (panel with 9 tasters), were studied using standard techniques.



<https://www.serpaflora.com/ensaio-5c>

## Results



- L1 Raw milk cheese without SF5C inoculum
- L2 Raw milk cheese + 2% SF5C inoculum
- L3 Raw milk cheese + 4% SF5C inoculum
- L4 Pasteurized milk cheese with 4% SF5C inoculum