VIABILITY OF NOVEL MICROENCAPSULATED INDIGENOUS CULTURES OF *LACTIPLANTIBACILLUS PLANTARUM* AND *LACTOCOCCUS LACTIS* IN PAG CHEESE PILOT PRODUCTION – PRELIMINARY RESULTS

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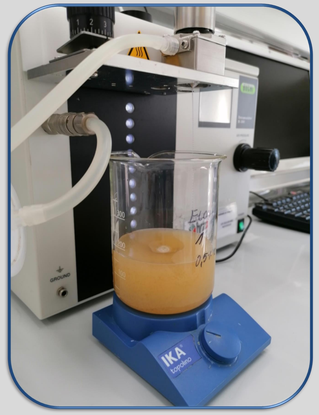
INTRODUCTION

The development of innovative technologies in the food industry has always been a priority in the improvement of the existing production and food properties. Regarding the main tasks of the project "*Potential of microencapsulation in cheese production*" (KK. 01.1.1.04.0058), the aim of this study was to characterize the isolates of lactic acid bacteria from the traditional cheese production chain and to select the potentially most suitable starter culture for application in microencapsulated form with rennet in the production of Pag cheese.

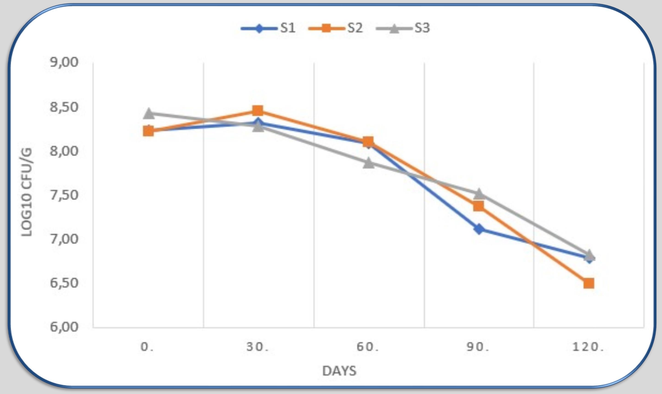
MATERIALS AND METHODS

Based on the established biochemical properties, *Lactiplantibacillus plantarum* strain from the lamb abomasum and *Lactococcus lactis* strain from sheep milk were selected for microencapsulation in two different formulations: separately (S2) and together with rennet (S3). Both formulations with non-encapsulated commercial starter cultures (S1) as control were used in the traditional production of Pag cheese and therefore six cheeses were produced from each formulation (N=18). Cheese samples were collected and microbiologically analyzed every 30 days during 120 days of ripening. To gain insight into the microbial population and the proportion of bacterial species, morphologically distinct colonies were selected in each analysis and identified using MALDI-TOF mass spectrophotometry. Statistically significant differences in bacterial count between groups were evaluated using the one-way ANOVA test, while the proportion of bacterial species was visualized by heat map analysis.



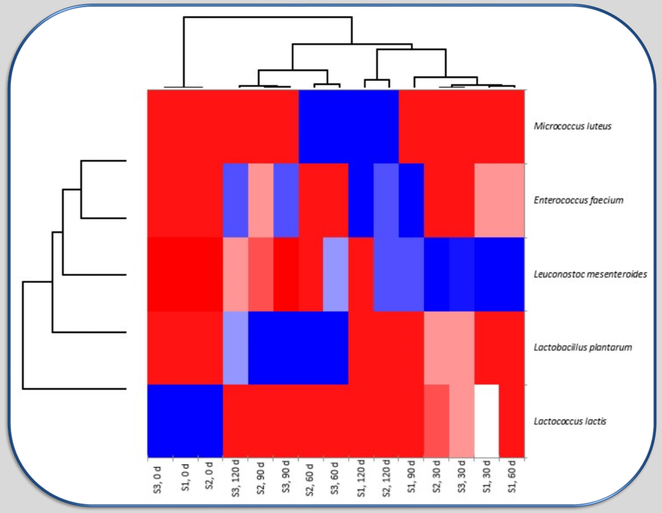
RESULTS

The average number of bacteria at day 120 was 6,78±0,02 (S1), 6,49±0,27 (S2) and 6,82±0,28 (S3) $\log_{10}$ CFU/g with uniform variations during the ripening process, but without a statistically significant difference between the groups ($p>0,05$). While the percentage of *Lc. lactis* strains decreased at day 30 and was not isolated later in all three groups, *Lb. plantarum* strains were isolated at each sampling stage (5-70%), but their proportion was significantly lower in the control group (S1) which is a first indicator of successful encapsulation.



CONCLUSION

Although additional molecular analysis should be performed to confirm authenticity with the original strains, this result suggests that the microencapsulated form of started cultures and rennet may become a new standard in cheese production while maintaining the traditional values of the product.



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