VIABILITY OF THE APPLICATION OF POTENTIAL PROBIOTIC *LACTOBACILLUS CASEI* IN SALAMI

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I. INTRODUCTION

In recent years, the consumer preference for healthier and safer food products has grown [1], and this result in a big change in consumption. This tendency has been imposing new concepts in the area of food technology, both scientific and industrial. The applicability of Lactic Acid Bacteria (LAB) probiotic strains in fermented meat products has gained space due to the numerous benefits related to the intake of these microorganisms. However, even a small change in a complex process as fermentation may alter the characteristics of the product. So, it is vale important the carefully study theses positively effect by following the pH, water activity, weight loss and growth of other microorganisms during the fermented process [2, 3]. Thus, the aim of this study was to evaluate the technological modifications by the addition of potentially probiotic LAB in salami during the ripening process.

II. MATERIALS AND METHODS

Two LAB strains from the Lactic Acid Bacteria Culture Collection were used São Paulo State University, Unesp (CCLAB-UNESP, WDCM1182) *Lactobacillus casei* SJRP 38 and *Lactobacillus casei* SJRP 146 and two commercial strains *Lactobacillus paracasei* BGP1(SACCO®) and *Lactobacillus rhamnosus* LGG (Chr-Hansen Ind. and Com. Ltda ®). All BAL strains were cultured in MRS broth and stored in sterile 20% glycerol at -80°C. The strains were later reactivated in MRS broth and incubated at 37°C for 24 hours. Those LAB were included in the salami formulation using the following ingredients: pork meat (85 g/100g), pork back fat (15 g/100g), sucrose (2 g/100g), sodium chloride (NaCl) (2.5 g/100g), sodium erythorbate (0.5 g/100g), sodium nitrite (0.015 g/100g), sodium nitrate (0.015 g/100g), white pepper (0.2 g/100g), garlic (0.3 g/100g), nutmeg (0.3 g/100g) and starter culture, composed by (0.025 g/100g) Bactoferm T-SPX (Chr. Hansen, Hoersholm, Denmark) composed of Pediococcus pentosaceus and Staphylococcus xylosus. The pork meat and the pork back fat was grounded (8 mm) and mixed with NaCl and other ingredients: C, SJRP38, SJRP146, BGP1 e LGG. The samples of all treatments were stuffed in 15 cm in length of collagen casings (diameter of 50 mm) for each treatment. The temperature and relative humidity parameters (T °C and RH%) were controlled following the procedure until 20 days. During fermentation and ripening, analysis of pH value, weight loss, Aw and LAB count were carried out in triplicate. The pH was measured in triplicate in each treatment using a digital pH meter mPA-210, TECNOPON) with a penetration probe. To calculate the weight loss the samples were weighed in semi analytical balance throughout the processing. The water activity (Aw) was performed using Aqualab electric hygrometer. (Decagon Devices Inc., Pullman, USA).Total lactic acid bacteria (LAB) counts were determined by plate counting in MRS agar (OXOID, Hampshire, United Kingdom) after 48 h at 37 °C anaerobically. For the counting of *Pediococcus pentosaceus*, an MRS agar medium with the addition of (0.1%) of tetracycline was used to inhibit the growth of *Lactobacillus sp*. BAL probiotic potential counts were determined by the difference between total *Lactobacillus sp*., *Pediococcus sp* and *Pediococcus pentosaceus.* The results were analysed through the analysis of variance (ANOVA), with experimental design of completely randomized blocks, using the generalized linear model (GLM). It was performed to determine the significance of differences between physical-chemical data. Comparisons between means were evaluated by Tukey's test (P> 0.05).

III. RESULTS AND DISCUSSION

The addition of different lactic acid bacteria showed positive results for pH and aW analysis (Figure 1A e B), compared to the control (C) without addition of BAL. The reduction in pH during the salami

fermentation process increase the inhibition the growth of pathogenic and spoilage microorganisms. The values for pH showed no significant difference for days 0 and 20. The BAL count (Figure 2A) in the fermentation process showed similar values for the treatments ranging from 10 log CFU/g to 11 log CFU/g, showing a small reduction until the last point (20 days) highlighted for SJRP 38 with 8 Log CFU/g. The amount of lactic acid bacteria (Figure 2B) resulted in the salami after 20 days of fermentation showed better results for LGG and BGP1 with a count of 10 log CFU/g.

Figure 1. pH (A), water activity (Aw) (B), weight loss (C) in salami with probiotic strains, during 20 days of fermentation and ripening. [a,b,] Mean values in the same time with different letter presented significant differences in the Tukey Test (P> 0.05).[ns] Not significantly difference in the same time.

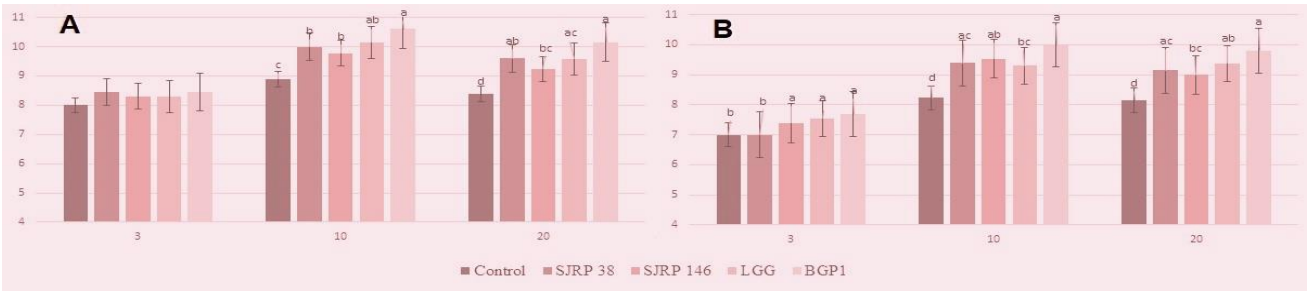

Figure 2. Bal count (A) and L. casei count (B) during ripening time of salami. (Log CFU/g). [a,b,c,d] Mean values in the same time with different letter presented significant differences in the Tukey Test (P> 0.05).

IV. CONCLUSION

The probiotic strains tested showed a potential application for fermented meat products, with high count of cell after the ripping process.

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