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Milk fermented by lactic acid bacteria as improver of technological characteristics in white bread replacing ingredients and additives

The aim of this study was to evaluate the effect of the use of fermented milk (FM) on the technological characteristics of white bread formulated with FM and without calcium propionate, improver, sugar, milk powder and vegetable fat compared to a control formulation (C) elaborated with these ingredients and additives. FM (LABs=4.02±0.04 logCFU/g, Lactobacillus acidophilus LA-5®, Bifidobacterium BB-12® and Streptococcus thermophilus), was added during kneading at three concentrations: F1=25%, F2=37.5%, and F3=50% based on flour weight. Fermentation and baking times were determined during the process, while in the bread technological and physicochemical analysis were performed during storage at 20°C on days: 1, 3, 5, 7. The centesimal composition of each formulation was also determined and Tukey's test ($p<0.05$) was used for analysis of the results. The use of FM reduced the times of fermentation (40%) and baking (20%) in doughs: F2 and F3 with respect to C. A high (F3) or low (F1) concentration of FM produced breads with significant differences ($p<0.05$) compared to C, where F3 presented greater moisture retention (~42%) and softer texture (~1430 g.f.), higher protein (12.89%) and fat (11.98%) contents with respect to the other formulations. Lactic fermentation favored the formation of larger crumb cell areas (0.76 mm²; total=37%) and the stability of physicochemical characteristics of low pH (~4.6) and high acidity (~1.57 mL NaOH 0.1N) during storage time. Breads formulated with 37.5% FM (F2) presented technological characteristics similar to C, therefore FM in this concentration may be used as a substitute of ingredients and additives to produce healthier and clean label breads.

Keywords:

bakery, functional bread, dairy product

Tipo de resumen

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