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Abstract:

The use of sourdough has numerous benefits, including improvement of the sensory attributes of baked bread in terms of flavour, texture, volume, enhanced nutritional value and extended shelf life of bread. To achieve the desired sourdough performance and bread with optimal quality and improved flavour, it is essential to understand how the starter cultures behave in specific conditions. In a previous part of this research, the metabolic traits of lactic acid bacteria starters and yeast from the food company S.P.C. (S. Korea) were studied. This thesis aimed to explore the pro-technological properties of the selected starter associations of bacteria/yeast, i.e., *Lactiplantibacillus plantarum* + *Fructilactibacillus sanfranciscensis* + *Saccharomyces cerevisiae* (PSY) and *Latilactobacillus curvatus* + *Levilactobacillus brevis* + *Saccharomyces cerevisiae* (CBY). Consequently, analysis of acidification, proteolysis analysis (including free amino acids), and volatile compound profile were done. PSY and CBY grew at the expected cell density. pH of the sourdoughs fermented by PSY decreased along the same line and slower than that of CBY over the course of 24 h. PSY sourdough had the highest TTA value (11.12 ± 0.03 ml) and organic acid production (148.6 ± 2.4 mmol/kg and 25.1 ± 1.5 mmol/kg) than CBY sourdough TTA value (9.01 ± 0.11 ml) and organic acid production (110.6 ± 1.6 mmol/kg and 20.2 ± 0.9 mmol/kg). This shows PSY as having a relatively high capacity for producing acids during sourdough fermentation among the two associations. After assessing their proteolysis capabilities, PSY sourdough had a presumptively higher peptide content while CBY produced the highest free amino acid content (i.e., Orn having a potential repercussion on bread flavour). Several volatile compounds belonging to different chemical classes, such as acids, aldehydes, ketones, alcohols, esters, and other compounds, were produced by PSY and CBY. In PCA, the control sourdough had a distinctive volatile profile from PSY and CBY. Both PSY and CBY show much correlation with about 4% variation. Ethanol, acetic acid, benzene ethanol, 2(3H)-furanone, dihydro-5-pentyl showed their strongest influence on both sourdoughs as they are

found in high amount. Finally, during sourdough fermentation, the associations performed in a desired way, and they showed differences in acidity and content of free amino acids that might have a strong influence on bread flavour. Less differences were observed in the volatile profile compounds of the two associations. Proper sensory analysis and consumer test (by the company) will be the most revealing of the differences observed in this experimental study.