

Probiotic starter cultures as a strategy for enhancing the bioconversion and valorization of sauerkraut

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ABSTRAC

The intrinsic health-promoting attributes of fermented cabbage could be improved by developing effective associations with probiotics in order to obtain innovative functional products. This study assessed the microbiological, physicochemical, antioxidant, and sensory properties of traditional sauerkraut by using commercial strains of *Lactiplantibacillus plantarum* 01 (LP01) and *Lactocaseibacillus rhamnosus* 04 (LR04) as single starter cultures. Cabbages were inoculated with spray-dried LP01 or LR04 and compared with a non-inoculated control group. Samples were incubated at 20 °C for 21 and 28 days. Administered strains were recovered and analyzed by pulsed-field gel electrophoresis (PFGE) to ensure the persistence and genotypic identity of the isolates. The LP01 and LR04 pulsotypes were detected in the samples obtained from the treated cabbages, indicating their presence throughout the entire fermentation process. In addition, inoculated sauerkrauts can be considered a probiotic food, containing approximately 10⁷ cfu/g of product. Compared to natural fermentation, the LP01 and LR04 strains reduced coliform bacteria on day 21 and ethanol production on days 21 and 28. The LP01-induced fermentation showed the lowest amounts of acetic acid and the greatest levels of water soluble carbohydrates (WSC), total polyphenols (TP), and antioxidant capacity (AC) measured by ABTS and DPPH assays on day 21. Moreover, the LP01 treatment had the highest integrity and the lowest juiciness, an overall natural lighter color and reduced vinegar and fermented odor. In conclusion, the application of the LP01 strain may optimise the quality of a final product with added probiotic properties, shortening the fermentation time from 28 to 21 days. Keywords Lactic acid bacteria · Probiotic · Sauerkraut · Controlled fermentation.

Palabras clave: Lactic acid bacteria, Probiotic, Sauerkraut, Controlled fermentation

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