Characterization of lactic acid bacteria isolated from infant faeces as potential probiotic starter cultures for fermented sausages

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Abstract

A total of 109 lactic acid bacteria isolated from infant faeces were identified by partial 16S rRNA, cpn60 and/or pheS sequencing. Lactobacillus was the most prevalent genus, representing 48% of the isolates followed by Enterococcus (38%). Lactobacillus gasseri (21%) and Enterococcus faecalis (38%) were the main species detected. A further selection of potential probiotic starter cultures for fermented sausages focused on Lactobacillus as the most technologically relevant genus in this type of product. Lactobacilli strains were evaluated for their ability to grow in vitro in the processing conditions of fermented sausages and for their functional and safety properties, including antagonistic activity against foodborne pathogens, survival from gastrointestinal tract conditions (acidity, bile and pancreatin), tyramine production, antibiotic susceptibility and aggregation capacity. The best strains according to the results obtained were Lactobacillus casei/paracasei CTC1677, L. casei/paracasei CTC1678, Lactobacillus rhamnosus CTC1679, L. gasseri CTC1700, L. gasseri CTC1704, Lactobacillus fermentum CTC1693. Those strains were further assayed as starter cultures in model sausages. L. casei/paracasei CTC1677, L. casei/paracasei CTC1678 and L. rhamnosus CTC1679 were able to lead the fermentation and dominate (levels ca. 10^8 CFU/ g) the endogenous lactic acid bacteria, confirming their suitability as probiotic starter cultures.