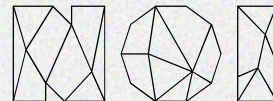


INTERNATIONAL  
CONFERENCE  
ON FERMENTED  
FOODS



TECHPARK SÜDTIROL / ALTO ADIGE

27-30TH  
OF OCTOBER  
2025

BOOK OF  
ABSTRACTS

# Fifty years of *Lactobacillus helveticus* adaptation: a comparative study in the context of dairy fermentations

[1] **Giulia Tabanelli**  
 [2] Alessia Levante  
 [1] Ida Mercurio  
 [1] Chiara Montanari  
 [1] Federica Barbieri  
 [1] Martina Filippini  
 [2] Irene Nicolini  
 [2] Monica Gatti  
 [2] Erasmo Neviani  
 [1] Luigi Grazia  
 [1] Fausto Gardini

● This work is part of the Helv4DairHy project, aimed at studying the evolutionary dynamics of *Lactobacillus helveticus* (LH) in traditional dairy environments by comparing strains isolated 50 years ago from natural whey starters and never revitalized and those obtained recently from the same habitat with the aim to understand how environmental and technological pressures have influenced LH strain biodiversity over the past five decades. The project relies on two extensive LH strain collections, one isolated and preserved in 1970 and the other isolated in 2023 from the same area to compare historical and contemporary LH biodiversity under a common ecological and technological context.

Phenotypic and genotypic characterization of about 40 LH strains revealed remarkable biodiversity. Old strains showed higher performances when cultivated in cultural medium and milk, highlighting higher growth rate and shorter lag phase. The most promising LH were further studied for their techno-functional properties in dairy food models.

Using a miniaturized cheese model, old and new strains were compared under conditions simulating traditional manufacturing. Old strains showed a higher tendency to decrease in concentration, probably due to lysis, and accumulated lower amounts of acetic acid and 3-hydroxy-2-butanone (acetoin), but higher levels of alcohols after two weeks of ripening.

These models offered a robust framework to translate microbiological and genomic data into insights supporting the selection of LH strains for tailored dairy applications, emphasizing the value of preserving and exploiting microbial biodiversity as a biotechnological resource.

This research is supported by EU - NextGenerationEU (Piano Nazionale di Ripresa e Resilienza (PNRR)), program Prin 2022 with the project "A 50 years evolutionary history of *Lactobacillus helveticus* from traditional dairy environments: biodiversity of strains as an opportunity for technological exploitation and new products - Helv4DairHy" (CUP J53D23010690006).

[1] Department of Agricultural and Food Science, University of Bologna, Italy  
 [2] Department of Food and Drug, University of Parma, Italy