

Poster 4

Population dynamics in an undefined mixed starter culture – the role of bacteriophages

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Aims

Undefined mixed starter cultures used in cheese production can be regarded as complex ecosystems containing mixtures of strains belonging to the species of lactic acid bacteria such as: *Lactococcus lactis* and *Leuconostoc mesenteroides*. Usually, these mixed cultures also contain various lytic and temperate bacteriophages that co-exist with the bacterial strains. The constant-diversity dynamics model (1) predicts that predation of the microbial community by bacteriophages increases the diversity of the microbial community by preventing the domination of the culture by a single species. In this study, we set out to investigate the impact of the phage predation on the diversity and performance of an undefined dairy starter culture.

Methods and results

Well characterized single colony isolates were used to create defined blends of strains (with and without the presence of bacteriophages) possessing specific characteristics (e.g. protease activity). The microbial population dynamics and the effect of phage predation in these blends was monitored during sequential propagation using real-time PCR amplification of unique genes associated with the different strains in the blend. The phage abundance was monitored by enumeration of plaques using phage sensitive indicator strains on agar plates.

Conclusions

We found that prolonged propagation of the culture had a profound influence on its composition.

Significance of study

The observed dynamics in relative abundance of bacteriophages in the culture demonstrates an equilibrium between phage sensitive and phage resistant variants in the culture during prolonged propagation.

Reference