

Surface microflora of Limburger cheese

Stefanie Goerges¹, Catherine Bonaiti², Nagamani Bora³, Roberto Gelsomino⁴
and Siegfried Scherer¹

¹Abteilung Mikrobiologie, Zentralinstitut für Ernährungs- und Lebensmittelforschung Weihenstephan, Technische Universität München, Germany; ²INRA, Laboratoire de Génie et de Microbiologie des Procédés Alimentaire, France; ³School of Biology, University of Newcastle, UK; ⁴BCCM/LMG Bacteria Collection, University of Gent, Belgium
e-mail: S.Goerges@wzw.tum.de

The surface microflora of smeared cheeses is a complex consortium consisting of yeasts, coryneform and other Gram-positive bacteria. However, the composition and the interactions between the different ripening organisms are not known in detail.

In this study the microflora of three batches of Limburger cheese produced by one dairy was investigated at an early, middle and late stage of ripening. From each of the nine cheese samples 50 yeasts and 50 bacteria were isolated which resulted in a total of 450 yeast isolates and 450 bacterial isolates.

Screening and identification of yeast isolates was done by Fourier Transform Infrared (FTIR) spectroscopy. To confirm the FTIR-results, representative yeast strains were investigated by physiological tests. Bacterial isolates were screened by rep-PCR. Representative bacterial strains were identified and characterized using a polyphasic approach including several phenotypic and genotypic tests. Furthermore, DNA was extracted directly from the cheese surface and Denaturing Gradient Gel Electrophoresis (DGGE) was then applied to determine the number of different bacterial taxa present and to see whether there were unculturable bacteria on the cheese surface.

The yeast flora solely consisted of *Debaryomyces hansenii* and *Galactomyces geotrichum*. *D. hansenii* dominated the flora during the different stages of ripening of all batches, except for the early stage of Batch 2. The larger part of the bacterial isolates was identified as the newly described species *Arthrobacter arilaitensis*. Additionally, *Brevibacterium aurantiacum*, another recently described species, was found. The species diversity on the surface of Limburger cheese was not as high as expected according to the literature.