**Development of a chromatographic profiling method for the analysis of heteroexopolysaccharides in yoghurt**

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Lactic acid bacteria from the genera *Streptococcus*, *Lactobacillus*, *Lactococcus* and *Leuconostoc* have been used as starter cultures in fermented foods for a very long time. During fermentation, some of these bacteria produce heteroexopolsaccharides (HePS) which for example influence the viscosity of yoghurt.1 The produced HePS are complex polysaccharides consisting of a repeating unit of at least 3 monomers. Frequently occurring monosaccharides are glucose, galactose, rhamnose, and *N*-acetyl-galactosamine. Due to differences in monosaccharide composition, linkage position, and branching of the main chain, a wide variety of different HePS occurs. The molecular structure as well as varying molecular weights determine the technofunctional properties of these polysaccharides.2 The aim of the described work was therefore to develop a chromatographic profiling method for selected HePS that enables the structural analysis in a short time and with a high sample throughput. Since texturizing starter cultures are already in use in fermented milk products,1 we developed a sample workup which allows the application of the method for the analysis of yoghurt.

First, various conditions for partial acid hydrolysis were tested and the resulting low molecular weight compounds were analyzed by high-performance anion exchange chromatography coupled with pulsed amperometric detection and mass spectrometry (HPAEC-PAD/MS2). By using suitable conditions, it was possible to detect characteristic products for the selected HePS. Various sample workups were tested for the isolation of the HePS fraction from yoghurt, for example the separation of proteins with proteases or by trichloroacetic acid. Although the isolated polymers were not completely pure, it was possible to detect the characteristics oligomers after partial acid hydrolysis. The application of the method to different commercial yoghurt samples demonstrated that some of the selected HePS can be found in yoghurt. Therefore, the chromatographic analysis of HePS in pure form or in fermented foods after partial acid hydrolysis proved to be a promising approach for supplementing to existing methods, for structure elucidation, and for a rapid detection of HePS in food.

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*References:*

1 Mende, S., Rohm, H. and Jaros. D. (2016). Influence of Exopolysacchairdes on Structure, Texture, Stability and Sensory Properties of Yoghurt and Related Products, *International Dairy Journal* *, 52*, *57*-71.

2 Tuinier, R., van Casteren, W. H. M., Looijesteijn, P. J., Schols, H. A., Voragen, A. G. J. and Zoon, P. (2001). Effects of Structural Modifications on Some Physical Characteristics of Exopolysacchairdes From *Lactococcus lactis*, *Biopolymers, 59*, *3*, 160-166.