Analytical methods for monitoring the sensory properties of semi-hard cheese during storage.
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Abstract

The sensory properties (taste, texture and smell) of semi-hard cheese are changing during storage. The objective of this research project was to understand which chemical processes may cause those changes by monitoring 2 types of cheese during the storage. Different analytical methods were set-up to monitor different types of key compounds (e.g. aromas) or key properties (e.g. rheology) of cheese. The methods developed for this project had to be as fast, automated and reliable as possible.

In this project, the capability of the DHS method to monitor the changes of cheese aromas during storage was shown. The ITEX method was optimized and its potential as a DHS alternative was confirmed. Furthermore, the repeatability of the ITEX was demonstrated with the coefficients of variance being less than 6% for the aromas compounds tested (6 replicate measurements). The solvent extraction of free fatty acids from cheese was proved to be fast and repeatable (coefficient of variance of 13%, 5 replicates). The extraction's reproducibility was very good as a two-factor ANOVA test showed no significant difference between 2 analysts. The reliable uniaxial compression method was successfully used to follow the rheological properties of cheese during storage. Finally, the SDS-PAGE method was highly efficient for monitoring the changes in protein profiles of cheese. A linear correlation ($R^2=0.89$) between the degree of proteolysis and the degradation of the casein group measured with SDS-PAGE was confirmed. In the near future, all those methods will be further implemented to help FrieslandCampina follow better the cheese during different storage periods.