



18th WELLMANN INTERNATIONAL SCIENTIFIC CONFERENCE

BOOK OF ABSTRACTS



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DIELECTRIC MEASUREMENTS FOR MONITORING DAIRY TECHNOLOGY PROCESSES

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Dielectric properties of milk has been well studied, however, there are just few researches about analyzing dielectric behavior to monitor processes of dairy technology. In our study, the change of dielectric constant and dielectric loss factor were measured during chymosin-induced coagulation of cow milk, and the ripening period of Trappist cheese and Bácskai kneaded cheese. The dielectric measurements were carried out using open-ended coaxial probe technique in the frequency range of 200-2400 MHz. The enzymatic coagulation was monitored by measuring relative viscosity. During cheese ripening, texture profile analysis and instrumental color analysis were also applied to determine whether the changes of dielectric properties are correlated with the physico-chemical changes.

Our results show, that dielectric parameters increased tendentially with frequency during the enzymatic coagulation. The process was detectable by observing that the significant increase of dielectric constant broke, when the viscosity growth of the forming gel structure appeared. As a function of ripening time, the dielectric constants decreased for Trappist cheese, while increased for kneaded cheese. The hardness, the adhesive force and the difference of dielectric constants determined between the rind and the center of the cheeses reached maximum or minimum values on the same day of ripening period. Moreover, linear correlations were observed between the dielectric constants at specific frequencies and the averages of color coordinates. Our results verified that the rapid, non-destructive and chemical-free dielectric measurement method has great potential to determine the optimal time period of dairy technology processes.