



E566

**Stability of fermented and fortified apple juices by protein microencapsulated
Lactiplantibacillus plantarum 299v during storage**

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In recent years, the application of probiotics in healthy, vegan, and fortified food has steadily increased and taken up a substantial position in the market. In this work, encapsulation of *Lactiplantibacillus plantarum* 299v by the whey protein (WP) and denatured whey protein (DWP) as well as fortification of apple juice with the probiotic microcapsules and storage study were aimed. Different ratios of core-to-wall and of wall materials, as well as storage of fortified apple juice at different temperatures were applied and investigated. Probiotic apple juices fortified by microcapsules and stored at 4°C for 6 weeks retained the highest cell number at the end of the storage period. Meanwhile the storage time and the temperature played crucial role in the viability of the probiotic cells in apple juice, whereas the ratios, formulations, as well as fortification technologies (fermentation or incorporation) did not significantly express any effects on it. Additionally, probiotic apple juices fortified by microcapsules coated with WP:DWP 1:1 and a core-to-wall ratio of 1:1 and stored at 4°C for 4–8 weeks exhibited a significantly lower pH value. These findings may provide good base to produce fortified apple juice in the industry.

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E567

**Assessing the Viability of Near Infrared Spectroscopy for Classifying Goat Milk Samples
Based on Breed, Lactation Period and Sampling Period**

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Goat milk is a vital, sustainable dairy product source that contributes significantly to the global dairy market, and therefore its composition and quality need to be monitored. Near Infrared Spectroscopy (NIRS), as a versatile and non-destructive approach, can be used to evaluate different milk parameters. By developing NIRS models for the classification of goat's milk samples based on goat's breeds, lactation period, and sampling period, we aim to evaluate the utilization of NIRS as an efficient and economical alternative compared to traditional laboratory methods.

In total, 45 samples were collected from two breeds, the French Alpine goats, and Autochthon Red goats. Within each breed, half of the samples originated from lactation beginning and another half from the end of the lactation season. The NIRS measurements were conducted using treated, untreated, and diluted milk samples. Experiments were performed both with benchtop and handheld spectrophotometers.

Qualitative analysis was performed by the principal component analysis-based linear discriminant analysis (PCA-LDA) and showed the applicability of NIRS for the classification of samples with an accuracy between 63.74% and 100% depending on the breed, lactation period, and sampling period.

The results showed that NIRS, a non-destructive method for milk analysis, can provide valuable insights for producers in their decision-making, improving product quality and profitability.