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IMPLEMENTING FTIR-ATR TECHNIQUE TO DETERMINE STABILITY OF THE PROBIOTIC *LACTOBACILLUS CASEI* LOADED IN WHEY PROTEIN-Ca-ALGINATE MICROPARTICLES

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Fourier transform infrared spectroscopy (FTIR) is widely used to study the molecular structure of various compounds, but also for rapid identification of microorganisms, especially probiotics. The aim of this study was to determine the stability of the probiotic *Lactobacillus casei* during incorporation in microparticles comprised of Ca-alginate and whey proteins aimed to protect the probiotic during application in food/pharmaceutical products, storage and *in vivo* administration. FTIR-ATR spectra were recorded at room and at temperatures needed for the vitality of the bacteria. The spectra were recorded using Golden Gate™ ATR attachment, in frequency range of 4000-400 cm⁻¹. Spectra of non-encapsulated *Lactobacillus casei* and released from the microparticles were compared.

The spectra obtained from the released *Lactobacillus casei* showed almost identical features with non-encapsulated specimen, including the band at 1127 cm⁻¹ from the lactic acid obtained as fermentation product. Because of the complex structure of the investigated sample, a rough assignment of the corrected FTIR-ATR spectra has been made. The bands at ~2845 cm⁻¹ and ~2929 cm⁻¹ due to asymmetric stretching and at ~1372 cm⁻¹ and ~1430 cm⁻¹ due to deformation vibrations of -CH₃ and CH₂- were detected. A band at ~1730 cm⁻¹ due to the C=O stretching vibration of the ester groups into the fatty acids and lipids together with Amide I and Amide II bands at ~1620 cm⁻¹ and 1530 cm⁻¹ from proteins were also observed. In the IR fingerprint region, the symmetric and asymmetric stretching from the phosphoric acid in nucleic acids at 1030 cm⁻¹ and 1190 cm⁻¹ was found, together with the C-O-C deformation vibration from the polysaccharides (900-1200 cm⁻¹) bonded to the glycopeptides and lipopolysaccharides of the cell wall.

In conclusion, according to the FTIR-spectroscopic studies, the stability of the probiotic cells during microencapsulation was preserved.

Keywords: FTIR, *Lactobacillus casei*, microparticles.

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Cyanide compounds in the environment. Cyanide compounds can release the toxic cyanide ion. There is a need for rapid and sensitive methods for the determination of total cyanide in heterogeneous samples, from 1 to 100 mg/L.

Gas chromatographic analysis of cyanide compounds using a Elite 624 capillary column programmed from 60°C (1 min) to 200°C (1 min) and HCN is liberated during an injection into a headspace vial. This method is free from interference. The LOD was 0.1 µg/L (r²=0.9991). The within-run precision for samples with known amount was efficient and simple.

Keywords: GC determination of cyanide