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Rapid identification with MALDI-TOF MS Biotyper of microorganisms isolated from raw cow milk

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Matrix-assisted laser desorption/ionization time-of-flight (MALDI-TOF) mass spectrometry (MS) has become a rapid tool for microbial identification of food and beverages. The aim of the study was to evaluate microbiological quality of raw cow milk produced in Slovakia. Additionally, 35 raw cow milk samples from the western and middle Slovak producers were collected (Banovce nad Bebravou, Liptovský Mikuláš, Červený Kameň, Vážec). Samples were collected in sterilized sample containers and brought to laboratory with icebox for microbiological investigation. Samples were kept in a refrigerator ($4\pm 1^\circ\text{C}$) until the testing began. The total count of bacteria, coliforms, enterococci, lactic acid bacteria and microscopic filamentous fungi were detected in raw cow milk samples. Total numbers of bacteria were cultured on Plate count agar at 37°C for 24-48 h, aerobically; enterococci were cultured on Enterococcus selective agar at 37°C for 24-48 h, aerobically; coliforms bacteria were cultured on Violet Red Bile lactose agar at 37°C for 24-48 h. The LAB were cultured on MRS (Main Rogosa agar), MSE

and APT agar at 30°C , microaerophilic. The microscopic fungi and yeasts were cultured on Malt extract agar at 25°C for 5 days, aerobically. Isolated strains (total 220) were subjected to identification by the MALDI-TOF MS profiling. Typical bacterial colonies were selected for identification with MALDI-TOF MS Biotyper. In group of lactic acid bacteria three genera were identified: *Lactococcus* and *Leuconostoc*. *Lactobacillus* spp. was the most abundant genus, which was found in 35, *Leuconostoc* in 20 and *Lactococcus* in 15 samples. *Lactobacillus* was mostly represented with *Lactobacillus plantarum*, *L. garvieae* and *L. acidophilus*. Another bacterial isolates included Gram-positive and Gram-negative *Citrobacter youngae*, *Enterococcus faecalis*, *Escherichia coli*, *Ewingella americana*, *Klebsiella oxytoca*, *Lelliottia amnigena*, *Raoultella ornithinolytica* and others. Our study shows that MALDI-TOF MS could serve as an important method for identifying microorganisms for dairy industry needs.

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