

RAPID DETECTION OF ADULTERATED CAMEL MILK USING LOW-FIELD NUCLEAR MAGNETIC RESONANCE

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ABSTRACT

In this study, the transverse relaxation time (T_2) of adulterated camel milk obtained from different regions was detected using nondestructive low-field nuclear magnetic resonance (NMR). Camel milks from Alashan and Xinjiang regions, China were selected and treated under different conditions, including pasteurisation (65°C, 30 min) and high-temperature short-time (HTST) treatment (75°C, 15–20s) and adulterated with substances such as cow milk, sheep milk, soybean milk, urea and water. These adulterated milk samples were then subjected to low-field NMR detection and echo peak point data were recorded. The results showed that the distribution of the adulterated samples was well differentiated on the principal component score map and that characteristics among the samples were also clearly expressed by the principal component axis. Similarly, the T_2 of the adulterated samples gradually changed with varying adulteration ratios, the characteristics of which were fully expressed. The present data indicated that low-field NMR was advantageous for high-accuracy, simple, rapid, nondestructive and on-site detection. This newly developed measuring method is more convenient and particularly suitable for the identification of adulterated camel milk compared with traditional detection methods.

Key words: Adulteration, camel milk, nuclear magnetic resonance, PCA method