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Subscription

Czech J. Food Sci.

Herceg Z., Juraga E., Sobota-Šalamon B.,

Rezek-Jambrak A.,

Inactivation of mesophilic bacteria in milk by means of high intensity ultrasound using response surface methodology

Czech J. Food Sci., 30 (2012): 108-117

High-intensity ultrasound was used to investigate the inactivation of microorganisms in raw bovine milk. Raw bovine milk with 4% of milk fat was treated with ultrasonic probe that was 12 mm in diameter and with 20 kHz frequency immerged in milk directly. In the ultrasound treatment, three parameters were varied according to the statistical experimental design. The centre composite design was used to design and optimise the experimental parameters: temperature (20, 40, and 60 ° C), amplitude (120, 90, and 60 μm), and time (6, 9, and 12 min). All analyses were performed immediately after

sonication and after 3 days and 5 days of storage under refrigeration at 4 ° C. The factors that seem to affect substantially the inactivation of microorganisms in using ultrasound are the amplitude of the ultrasonic waves, the exposure/contact time with the microorganisms, and the temperature of the treatment. The results achieved indicate a significant inactivation of microorganisms under longer periods of the treatment with ultrasonic probe, particularly in combination of higher temperature and amplitude. The output optimal value of total bacteria count was defined by