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The Impact of Ultrasonic Treatment on the Physiochemical and Microbial Properties of Iraqi Soft Cheese

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ABSTRACT

In recent decades, there has been a shift towards using alternative methods to enhance traditional milk processing techniques and their derivatives. One such method is the application of ultrasonic treatment as a substitute for conventional pasteurization. The chemical content of milk treated with ultrasonic waves (US) for durations of 5 and 10 minutes at a frequency of 20 kHz and a temperature of 50°C showed increases in protein, fat, and acidity levels after 5 minutes of US pasteurization, registering at 3.50%, 3.65%, and 0.19% respectively, while the ash content was 0.73%. The logarithm of total microbial counts in milk samples showed no growth post-US pasteurization. The active compounds in the milk samples were identified using GC-MS, revealing the highest concentrations after 5 and 10 minutes of US treatment were of Hydroxy-2,8-bis(trifluoromethyl)quinoline, 2-methylpropionate 4- and Succinic acid, 3-methylbut-2-yl 3-chlorophenyl ester, at concentrations of 31.826% and 35.318% respectively. Samples treated for 10 minutes exhibited superior firmness, cohesiveness, and elasticity in soft cheese, with values of 179.9, 0.66, and 4.38, respectively. The lowest pH observed in these samples was 4.60, with the highest acidity at 1.68%. Moreover, ultrasonic treatment enhanced the sensory characteristics of the cheese, demonstrating that ultrasound waves can improve the microbial, physical, chemical, and sensory properties of white cheese.