Textural modifications in Oaxaca cheese made with ultrasonicated raw milk

CARRILLO-LOPEZ L. (1), ALARCON-ROJO A. (1), HUERTA-JIMENEZ M. (1), GARCIA-GALICIA I. (1)
1 Universidad Automa de Chihuahua, CHIHUAHUA, Mexico

In Mexico, Oaxaca cheese is the most popular cheese due to its melting properties. It is made by hand with raw milk in its region of origin (Oaxaca, Mexico). In this research, the effect of frequency (25 and 45 kHz) and time (15 and 30 min) of high intensity ultrasound (HIU) in fresh raw milk on the textural properties of Oaxaca cheese was evaluated. Results showed that 15 min of HIU shortened cheese melting time by up to 23.4 s compared to controls ($P < 0.0001$). Cheeses produced with ultrasonicated milk and 45 kHz presented higher melt areas ($P < 0.0001$). The lower pH (5.4) in cheeses produced with HIU compared to controls (5.7) positively modified functional properties during melting and solidification. Regarding thread formation, the results showed that with 25 kHz there was greater thread formation, regardless of the HIU time. The 45 kHz treatments (15 or 30 HIU min) and the controls formed fewer strings during the stringing test. In terms of hardness, cheeses made with milk sonicated at 45 kHz were softer, regardless of HIU time. Contrarily, the highest values ??of hardness were obtained with 25 kHz and in the controls. Lower pH values??produce calcium solubilization and reduced protein-protein interactions, resulting in a softer cheese. As with hardness, 25 kHz treatment produced higher values ??of chewiness (hardness*cohesion*elasticity) and gumminess (hardness*cohesiveness). HIU is a promising technology to positively modify the textural properties of Oaxaca cheese made with raw milk, producing softer cheeses with greater melting and strand-forming capacity.