Application of ultrasound in enzyme treatment of cheese whey

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Whey form cheese making have many types of proteins with admirable sustenance moreover either of them (α-lactalbumin, lactoferrin, glycomacropeptide and β-lactalbumin) should be used to produce bioactive peptide chains.

Experimental solution was made from whey protein isolate powder (WPI) with concentration of 10 w/w%. Laboratory scale sonicator with maximum power of 100W was used to generate ultrasound. Optimum of ultrasound conditions in the examined range (60-100% of amplitude, 5-30 minutes of treatment time) were determined by Central Composite Face-centered model. Bromelain enzyme from pineapple was used for digestion of whey proteins. Changes of biological activity was followed by 2,2-diphenyl-1-picrylhydrazyl (DPPH) method.

Results showed that ultrasound treatment without enzymatic proteolysis can increase biological activity of proteins in whey after cheese making, but the effect of enzymatic proteolysis was higher: Sonicated samples had 3.0±0.5% growth of biological activity compared to control samples, while enzymatic treatment produced 18.3±0.4% increment.

Positive effect of enzyme treatment by bromelain combined with ultrasound was not proven: when hydrolysis was made after sonication of WPI solutions, growth of biological activity was only 9.7±0.5%.

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