Effect of sonication temperature on physicochemical and functional properties of chicken egg white and duck egg white

ABSTRACT

The effect of ultrasound treatment temperature (25, 35, 45, and 55ºC) on physicochemical and functional properties of chicken and duck egg whites were studied. Egg whites were treated with ultrasound generated by sonicator (frequency 40kHz) for 15 min, and their colour, pH, expressible moisture, folding test, gel strength, texture profile analysis, foaming capacity and stability, and emulsification stability were compared. Ultrasound treatment had caused a significant decrease ($p<0.05$) in pH and expressible moisture, apart from improving the gel strength and folding test score of egg white gels. Improvement of gel strength was substantiated by the significantly higher ($p<0.05$) hardness and springiness of egg white gels. Hardness and springiness of ultrasound-treated chicken egg white gels were 3019.17-3399.67 g and 8.71-9.23 mm, respectively. While ultrasound-treated duck egg white gels had the hardness values at 2143.23-2732.50 g, and springiness values in the range of 6.14-6.37 mm. However, ultrasound treatment did not significantly ($p>0.05$) affect the functional properties of chicken egg white. The effect of ultrasound was more pronounced on duck egg white as evidenced by the significantly higher ($p<0.05$) foaming capacity (140.00%) and foaming stability (66.67%). Hence, effect of ultrasound temperature is worthy for further investigation with duration and intensity of ultrasonic waves to improve functional properties of egg white, especially duck egg white.