Effect of ultrasound treatments on functional properties and structure of millet protein concentrate

In this study, the effect of high power ultrasound (US) probe in varying intensities and times (18.4, 29.58, and 73.95W/cm² for 5, 12.5 and 20min respectively) on functional properties of millet protein concentrate (MPC) was investigated, and also the structural properties of best modified treatment were evaluated by FTIR, DSC, Zeta potential and SDS-PAGE techniques. The results showed the solubility in all US treated MPC was significantly (p<.05) higher than those of the native MPC. Foaming capacity of native MPC (271.03±4.51ml) was reduced after US treatments at low intensities (82.37±5.51ml), but increased upon US treatments at high intensities (749.7±2ml). In addition, EAI and ES increased after US treatments. One of the best US treatments that can improve the functional properties of MPC was 73.95W/cm² for 12.5min that resulted in reduction of molecular weight and increase nearly 36% in the negative surface charge that was confirmed by SDS-page and Zeta potential results, respectively.