

Title: Solubility, Structural Characteristics, and Antioxidant Properties of Potato Protein Hydrolysate

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Potatoes are the fourth largest food crop in the world (after maize, rice, and wheat), being actively cultivated in more than 100 countries. Potato proteins contain the essential amino acids recommended by the WHO, FAO, and UNU; however, most potato proteins lack the functional properties (e.g., solubility) required by the food industry. Our objective in this study was to compare potato protein isolate (PPI) and potato protein isolate hydrolysate (PPIH) in terms of solubility, structural characteristics, and antioxidant activity. The molecular weight distributions were determined by sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE). Protein solubility was determined using the Kjeldahl method. The particles were characterized using the 90Plus Particle Size Analyzer. The viability of skeletal muscle cells (C_2C_{12}) was determined using MTT assays. PPI presented three major bands corresponding to 30-32 kDa and 16-18 kDa. PPIH did not present any protein bands. Using the MALDI-TOF process, the molecular weight of PPIH was estimated at 103.5-422.7 Da. In nanoparticle samples, we observed a shift in the peak positions of PPI and PPIH from 10 nm to 1.7 nm. The solubility of PPIH was significantly better than that of PPI in pH3~8. PPIH group significantly increased the cell viability of C_2C_{12} compared with PPI group. Overall, our findings indicate that PPIH is superior to PPI in terms of solubility and protective effects.

Biography

Chiung-Yueh Chang has studied her PhD with a major in nutrition and health sciences in Taipei Medical University. She is a dietitian in a biotech company, focusing on supplement food research now.

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