

# **Influence of oxidative browning inhibitors and isolation techniques on sweet potato protein recovery and composition**

Lawrence A. Arogundade, Tai-Hua Mu

## **Abstract**

Effects of oxidative browning inhibitors on sweet potato protein (SPP) recovery and quality were studied. Oxidative browning inhibitors successfully decreased sweet potato oxidative browning, but reduced both SPP extractability and recovery. Ultrafiltration/diafiltration processed sweet potato (UDSP) protein (at pH 4, 6 and 7) showed significantly ( $p < 0.05$ ) higher yield, purity, solubility, thermal stability and amino acid constituents than that of isoelectrically precipitated sweet potato (IPSP) protein (at pH 4). The yield of UDSP proteins was more than twice that of IPSP protein. Denaturation temperature ( $T_d$ ), enthalpy change ( $\Delta H$ ) and solubility (at pH 3 and 8) of UDSP proteins were in the ranges 82.89–90.29 °C, 6.34–11.35 (J/g) and 71.4–94.2%, respectively, while that of IPSP protein were 85.27 °C, 2.35 (J/g) 31.2% and 55.5%, respectively. Ratio of SPP essential amino acid to the total amino acid ratio ranged from 0.49 to 0.51. SPP in vitro digestibility and digestibility-corrected amino acid score (PDCAAS) ranged 70–80.7% and 44.79–51.08%, respectively.

## **Highlights**

► Bisulphites, citric and ascorbic acid inhibited sweet potato oxidative browning. ► Oxidative browning inhibitors reduced sweet potato protein recovery. ► Sweet potato proteins had low phytic acid and trypsin inhibitor but high tannin. ► Sweet potato proteins are rich in sulphur-containing amino acid. ► Membrane and isoelectric processed sweet potato proteins had high thermal stability.

## **Keywords**

Sweet potato protein; Oxidative browning inhibitor; Protein recovery; Isolation technique; Chemical composition; Thermal stability