

**Title** Controlling vascular streaking and surface browning in cassava (*Manihot esculenta* Crantz) roots with postharvest heat treatment

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### **Abstract**

Cassava is a staple food of over 500 million people in the developing world and is a raw material of various industrial products such as starch, glucose and ethanol. A primary constraint in production and utilization is the very short shelf life of the fresh roots of 2-3 days due to rapid vascular streaking (VS) and cut surface browning (SB). This study determined the effects of hot water dip (HWD) in controlling VS in intact or unpeeled roots and both VS and SB in peeled roots of cassava cv. 'Golden Yellow'. Unheated roots served as control. Modified atmosphere packaging (MAP) of heated and unheated roots was also tried using 0.075 mm-thick 30 cm x 40 cm polyethylene bag with 16 holes 2 mm in diameter holes and containing 2 kg roots/bag as established in earlier studies. Storage was done at ambient (25-32°C, 68-90% RH). VS affected all unheated roots after 5-8 days. HWD significantly reduced VS in intact roots with 30 min dip in 51-53°C water as the optimum rate. Using higher water temperature of up to 59°C for shorter dip period of 10-15 min was less effective. MAP also effectively reduced VS and when applied together with HWD particularly at higher water temperature of 54-59°C, VS further decreased. However, hydrocyanic acid content of the roots increased. Moreover, MAP with or without HWD remarkably reduced weight loss and maintained the desirable taste of roots when steamed. In peeled roots, surface browning was very rapid becoming severe after 4 hours while VS affected all roots after only 36 hours from peeling. HWD markedly reduced SB and VS with the 15 min dip in 57-59°C water as the most promising treatment. MAP did not affect SB and VS but it again reduced weight loss considerably.