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Title: Effects of incorporation of grape skin and extrusion cooking on the nutritional and functional properties of cassava-defatted soy porridges

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Abstract

Fruit and vegetable wastes are inexpensive, available in large quantities and contain dietary fibre and phenolic compounds which are of immense health benefits. A viable approach to better utilize food by-products is to incorporate them into locally grown food crops with the use of extrusion cooking to produce ready-to-eat products. Cassava-defatted soy flour and grape skin (100:0, 90:10, 80:20 ratios) were extruded using a twin screw extruder. The extrudates were dried, milled and reconstituted to produce instant porridge. The effects of extrusion cooking and grape skin inclusion level on the starch digestibility, in-vitro protein digestibility, water absorption index (WAI), solubility index, total phenolics content (TPC), anti-oxidant activity solubility index and dietary fibre content of cassava-defatted soy porridges were determined. Extrusion cooking led to a reduction in the in-vitro protein digestibility of all extrudates. The WAI was reduced by addition of grape skin but solubility index was significantly increased. Grape skin addition increased the TPC and anti-oxidant activity of extrudates though extrusion cooking led to a significant decrease. Extrusion cooking promoted fibre fragmentation with an increase in soluble dietary fibre. Addition of grape skin at 10 and 20% reduced the starch digestibility and decreased the glycaemic index of cassava-defatted soy porridges and this suggests that grape skin phenolics may inhibit the activities of digestive enzymes thereby decreasing starch digestibility. Addition of grape skin has the potential to reduce glycaemic index of cassava-defatted soy porridges possibly by inhibition of the activities of digestive enzymes.