

Physical, Microstructural and Functional Quality Improvements of Cassava-Sorghum Composite Snacks

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Abstract : Healthy chips now dominating the snack market shelves. More than 80% processed snack foods in the market are chips. This research takes the advantages of twin extrusion technology to produce two types of product, i.e. directly expanded and intermediate ready-to-fry or microwavable chips. To improve the functional quality, the cereal-tuber based mix was enriched with antioxidant rich mix of temurui, celery, carrot and isolated soy protein (ISP) powder. Objectives of this research were to find best composite cassava-sorghum ratio, i.e. 60:40, 70:30 and 80:20, to optimize processing conditions of extrusion and study the microstructural, physical and sensorial characteristics of the final products. Optimization was firstly done by applying metering section of extruder barrel temperatures of 120, 130 and 140 °C with screw speeds of 150, 160 and 170 rpm to produce direct expanded product. The intermediate product was extruded in 100 °C and 100 rpm screw speed with feed moisture content of 35, 40 and 45%. The directly expanded products were analyzed for color, hardness, density, microstructure, and organoleptic properties. The results showed that interaction of ratio of cassava-sorghum and cooking methods affected the product's color, hardness, and bulk density ($p < 0.05$). Extrusion processing conditions also significantly affected product's microstructure ($p < 0.05$). The direct expanded snacks of 80:20 cassava-sorghum ratio and fried expanded one 70:30 and 80:20 ratio shown the best organoleptic score (slightly liked) while baking the intermediate product with microwave were resulted sensorial not acceptable quality chips.

Keywords : cassava-sorghum composite, extrusion, microstructure, physical characteristics

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