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NUTRIENT COMPOSITION, FUNCTIONAL, PHYSICAL AND PASTING PROPERTIES OF YELLOW YAM (*Dioscorea cayenensis*) AND JACK BEAN (*Canavalia ensiformis*) FLOUR BLENDS

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Abstract

The study therefore focused on the nutrient composition, functional, physical and pasting properties of yellow yam and jack bean flour blends. Yellow yam tubers and jack bean seed were processed into flour, blended together and D-optimal mixture design was used to generate the percentage of yellow yam and jack bean flour resulting to a total of nine experimental runs. The flour blends were analyzed for nutrient composition, functional, physical and pasting properties using standard methods. Data obtained were subjected to statistical analysis. Means, analysis of variance were determined using SPSS version 21.0 and the difference between the mean values were evaluated at $p<0.05$ using Duncan multiple range test. The effect of optimization procedure was investigated using Design expert version (8.0). Crude protein, total carotenoids, starch, amylose and amylopectin ranged from 9.97 to 16.72%, 5.24 to 6.65 μ g/g, 79.38 to 80.07%, 25.36 to 29.88% and 70.13 to 74.65% respectively. Addition of yellow yam and jack bean flour had no significant ($p>0.05$) effect on the antinutritional composition (saponin, trypsin inhibitor and total polyphenol). Range of values for bulk density, dispersibility, water absorption capacity, swelling power and solubility index ranged from 0.62 to 0.73g/ml, 75.5 to 80.4%, 4.19 to 6.54g/g, 4.52 to 5.70g/g and 6.53 to 6.77% respectively. The yellowness (b^*) of yellow yam and jack bean flour blend were not significantly ($p>0.05$) affected while the peak viscosity, breakdown viscosity, final viscosity and setback value ranged from 206.0 to 572.0RVU, 5.0 to 17.0RVU, 263.0 to 9.11.0RVU and 279.0 to 372.0RVU respectively. The flour blends were optimized with respect to crude protein, total carotenoid, starch content, amylose, amylopectin, dispersibility, water absorption capacity, swelling power, solubility index, peak viscosity, breakdown viscosity and yellowness were maximized while bulk density, final viscosity and setback values were minimize. The optimum flour blend ratio was 94.11% yellow yam and 5.89% jack bean flour.