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American Journal of Food Technology 

Title: Effect of Extrusion Process Variables on the Amylose and Pasting Characteristics of Acha/Soybean Extudates Using Response Surface Analysis

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Abstract: Acha and soybean flours were mixed in five ratios 100:0, 87.5:12.5, 75:25, 62.5:37.5 and 50:50% of acha and soy flour respectively. The moisture content of the blends was adjusted to 15, 20, 25, 30 and 35%. Extrusion was carried out using a Brabender single screw laboratory extruder following a four variable response surface analysis design where the extruder screw speed was adjusted from 90, 120, 150 and 180-210 rpm and barrel temperature from 100, 125, 150, 175-200°C. Amylose content and pasting properties of raw and extruded samples were evaluated. Results showed that increase in feed composition (acha flour) resulted in increased amylose content in the blend. Amylose content decreased with higher barrel temperatures while increased moisture levels of blend caused increased amylose levels in extruded products. The pasting characteristics showed that acha native starch had normal non-waxy starch pasting properties while blended and extrudate samples did not show any recognizable peaks which were indicative that blending and extrusion altered significantly the rheological properties of the extrudates. Extrusion processing reduced significantly ($p < 0.05$) the peak viscosity, the peak time, the set back index, while, consistency index significantly ($p < 0.05$) increased. The results showed that there was amylose content lowering indicative of significant ($p < 0.05$) amylose-lipid complexing. The extrudates and blends would be ideal for weaning, convalescent and convenient food formulations.

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