ABSTRACT

Raw material composition, loading rate and moisture level in extrusion processing have a direct bearing on physical properties of the product besides other extruder operational parameters. These properties greatly influence the consumer appeal, package design and shelflife of the product. This study aimed at evaluating the effect of sorghum and rice flour containing bamboo shoot flour (BSF) and other ingredients on resultant flour and product throughput. A commercial single screw extruder with a constant barrel temperature of 250°C and screw speed of 1480 rpm was used. Five different blends (100:0:0, 70:30:0, 60:30:10, 55:30:15 and 50:27:23 for rice, sorghum and BSF respectively, on dry weight basis) were extruded at three levels of water addition (15, 20 and 25 kg/h) and two feed rates (1800 and 2100 kg/h). Extrudates were analyzed for expansion ratio (ER). Extrudates were then milled to particle size of 2 mm and flour samples were analyzed for hydration properties, colour, bulk density (BD) and oil holding capacity (OHC). Product throughput was calculated using mass balance equation based on dry matter content of the raw materials and the corresponding extruded product. Mixture composition significantly affected all physico-chemical properties analyzed for the products except water solubility index (WSI). Feed rate significantly affected all physico-chemical of the product properties except WSI and colour lightness (L^*). Water addition significantly affected product mass transfer, ER, BD, colour and swelling capacity (SC). Therefore, BSF can be blended with other ingredients and extrusion parameters be manipulated to give forth a product with desirable properties.

Keywords

Bamboo Shoots, Extrusion, Physical Properties, Mass Transfer