ABSTRACT

Extrusion cooking has been extensively used to produce variety of foods like ready to eat breakfast cereals, baby foods, snack foods etc. Using a single screw extruder, and taking rice flour as the base ingredient, two locally available tuberous root vegetables- Greater yam *(Dioscorea alata)* and sweet potato *(Ipomoea batatas)* were used in this study for the development of ready-to-eat breakfast products. During extrusion cooking, the screw speeds ranged between 132 to 468 rpm and the barrel temperatures ranged between 103°C to 137°C. The parameters and their levels were chosen based on literature available on rice based extrudates. The extrudates were then analysed for various physical and physicochemical properties. With the help of those data, Response Surface Methodology (RSM) using Central Composite Design (CCD) was carried out. Using screw speed, barrel temperature and feed composition as the three independent variables, the three responses taken were bulk density, expansion index and breaking strength. The optimized conditions were used for developing 3 new products, involving rice flour, sweet potato powder, yam powder and tomato pulp powder. The products were analysed for their physical, proximate, sensory and antioxidant properties .There was a significant colour change in all the 3 samples as indicated by the total color change (ΔE) values. Texture analysis of the extrudate samples showed hardness values ranging between 28.68 N to 47.57 N. Amylose content was found to be 15.3% in RS, 14.7% in RY and 18.2% in RST. The antioxidant profile of the extrudates studied through-DPPH(2, 2-diphenyl-picrylhydrazyl) and FRAP(ferric reducing antioxidant property) showed that the antioxidant capacity in all the 3 extrudate samples was very low. Rice flour incorporated with sweet potato (RS) was judged the best on sensory evaluation. The studies have shown that both sweet potato *(Ipomoea batatas)* and greater yam *(Dioscorea alata)* tubers can be commercially exploited for the development of ready-to- eat (RTE) products.

Keywords: Extrusion, RSM, Antioxidant, RTE.