

Expansion Characteristics of Selected Starchy Crops during Extrusion

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Abstract: *In this study, the effect of extrusion process parameters of a locally developed extruder on the expansion of extrudates of the flour and starch of maize and cassava which are grown in Nigeria in large quantity was characterised. These were compared with those of wheat flour which is commonly used for the production of alimentary paste. The parameters considered include feed moisture (30, 40, 50 % d.b.), extruder temperature (40, 70, 100°C) varied by continuous running of the machine, thereby building up the temperature and screw speed (100, 150, 200 rpm). Response Surface Methodology, stepwise regression, correlation and Analysis of Variance were employed to a factorial experiment in completely randomised design. An increase in temperature and screw speed increased transverse expansion. The extrudates' moisture loss is directly proportional with expansion. Increasing feed moisture content caused a decrease in transverse expansion and increase in extrudate moisture content. These starchy crops at low extrusion time are smooth and can be suitable for pasta products. The equations relating extrudates expansion and the independent variables were established to predict the performance of the machine. Generally, the response surface study revealed the range of the extrusion variables for optimum performance. Quadratic coefficients fit the extrusion data very well, better than linear models.*

Keywords: *Extrusion, cassava, maize, wheat, expansion characteristics*