Response Surface Regression Modelling for the Quality Characteristics of Wheat - Plantain Composite Flour Bread Containing Gum Arabic from Acacia Senegal Var Kerensis

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This paper is based on a study on the quality characteristics of wheat - plantain composite flour bread containing gum Arabic from acacia Senegal var kerensis using response surface methodology. In the study the effect of partial replacement of wheat with 10- 40% plantain and the subsequent effect of gum Arabic on composite bread quality attributes was investigated. The characteristics of bread tested included hardness, springiness, cohesiveness, gumminess and chewiness. Wheat- plantain composites produced dough that took longer than the control to breakdown thus stronger dough. Plantain composites had a higher peak viscosity which indicated that the composites had a higher swelling index than the wheat (control). The model p-values were significant for both linear and quadratic models. The parameter estimates for hardness, springiness, cohesiveness, gumminess and chewiness were all statistically significant at a = 0.05 level of significance. The results indicated that low levels of plantain substitution may have no adverse effect on gluten functionality since composites bread volume did not differ significantly from the control. Gum Arabic as used in this study was found to improve the breads textural qualities such as reducing bread hardness and chewiness and increasing bread springiness.

Keywords: Response Surface Regression; Springiness; Gumminess; Gum Arabic; Wheat — Plantain.