

Optimasi Formula Tepung Sukun dan Gum Xanthan pada Roti Tawar Bebas Gluten menggunakan *Simplex Lattice Design* (Formula Optimization of Breadfruit Flour and Xanthan Gum in Gluten-Free White Bread using Simplex Lattice Design)

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ABSTRACT

Gluten-free white bread is bread without gluten flour, such as rice flour and cornstarch so it is safe for people who have gluten intolerant. In this study, breadfruit flour was added to increase fiber content. Based on the combination of those three flours, the ability of the gas retainer was still low, so it needed an adding xanthan gum. The adding of xanthan gum was replace the gluten function as a gas retainer on the fermentation, which makes the bread has good volume development. This research aimed to determine the optimum formulation for adding breadfruit flour and xanthan gum to gluten-free bread with formula optimization. The method used in this study is Simplex Lattice Design with two factors they are breadfruit flour (1-7%) and xanthan gum (1-5%) which created in total of 8 experiment combinations. The variables observe were specific volume and crude fiber. The results showed that the highest specific volume response was 3.349 cm³/g with the proportion of 5:5 (breadfruit flour : xanthan gum) and the highest fiber content response was 12.999% with the proportion of 6.5:3.5 (breadfruit flour : xanthan gum). The prediction model developed the quadratic model (specific volume) and the quartic model (crude fiber content). Based on the model, the optimum formulation was predicted to contain 5.204% breadfruit flour and 4.796% xanthan gum, yielding gluten-free bread with predicted values a specific volume of 3.29 cm³/g and a crude fiber content of 12.89%. The formula was validated to demonstrate no difference between the predicted and the actual values (valid), and its accuracy was greater than 90%, indicating that the prediction model was highly accurate.

Keywords: *xanthan gum, optimization formula, gluten free bread, simplex lattice design, breadfruit flour*