

Development of a High-Fibre Bread using Xylanase Enzyme as a Gluten Protein Replacement

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Xylanase enzyme is used to enhance the end product quality by giving fluffy and voluminous loaves of bread with soft and elastic properties with a small dosage. Therefore, testing the effect of xylanase is worth as a cost effective, suitable replacement for added gluten. The control sample was developed as closely to commercially available 'paralupaan'. The preliminary tests were done to prepare the control sample and identified the best bread formulation. The added gluten percentage was 3% of the dough in the control sample and it was reduced to 1.5% and 0% with added xylanase enzyme. Two series of formulations were prepared for each 1.5% and 0% gluten with 0, 30, 90, and 150mg/kg of xylanase enzyme. The physical parameters such as specific volume, density, height to width ratio of central slice, dough to bread weight ratio, hardness of the bread and the L*a*b* colour values of the crumb and crust of the bread were measured and the data were statistically analyzed. According to the physical parameters, 150 mg/kg xylanase with 1.5% gluten added sample and 150 mg/kg xylanase with 0% gluten added sample had comparable properties to the control sample and hence they were selected for the sensory analysis. Sensory analysis of these two formulations and control sample revealed that the 1.5% gluten and 150 mg/kg xylanase added bread was preferred over 0% gluten and 150 mg/kg xylanase added bread. The proximate analysis showed that carbohydrate content was decreased and crude fibre content was increased significantly ($P < 0.05$) when the added gluten in the high-fibre bread was reduced by 50% and 150mg/kg xylanase was incorporated. This study showed that incorporation of xylanase enzyme has a potential to replace added gluten in high-fibre bread.

Keywords: Finger millet, Gluten replacement, High-fiber bread, Xylanase

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