

Utilizing Bario Rice, a Natural Red-Pigmented Rice from Sarawak, Malaysia, in the Development of Gluten-Free Bread

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Abstract : Current trends in gluten-free food development are increasingly leaning towards the utilization of pigmented rice flour, with a particular focus on Bario Merah Sederhana (BMS), a red-pigmented rice native to Sarawak, Malaysia. This study delves into the evaluation of the nutritional, textural, and sensory attributes of gluten-free rice bread produced from a blend of BMS rice flour and potato starch. The resulting samples are denoted as F1 (100% BMS rice flour), F2 (90% BMS rice flour and 10% potato starch), F3 (80% BMS rice flour and 20% potato starch), and F4 (70% BMS rice flour and 30% potato starch). Comparatively, these gluten-free rice bread formulations exhibit higher levels of ash and crude fiber, along with lower carbohydrate content when juxtaposed with conventional wheat bread. Notably, the crude protein content of the rice bread diminishes significantly ($p < 0.05$) as the proportion of rice flour decreases, primarily due to the higher protein content found in wheat flour. The crumb of the rice bread appears darker owing to the red pigment in the rice flour, while the crust is lighter than that of the control sample, possibly attributable to a reduced Maillard reaction. Among the various rice bread formulations, F4 stands out with the least dough and bread hardness, accompanied by the highest levels of stickiness and springiness in both dough and bread, respectively. In sensory evaluations, wheat bread garners the highest rating ($p < 0.05$). However, within the realm of rice breads, F4 emerges as a viable and acceptable formulation, as indicated by its commendable scores in color (7.03), flavor (5.73), texture (6.03), and overall acceptability (6.18). These findings underscore the potential of BMS in the creation of gluten-free rice breads, with the formulation consisting of 70% rice flour and 30% potato starch emerging as a well-received and suitable option.

Keywords : gluten-free bread, bario rice, proximate composition, sensory evaluation

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