

## New Insights Into Gluten-Free Bread Staling Treatment

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**Abstract :** Gluten-free foods are still the only treatment for gluten-allergic patients. Consequently, this study is concerned with improving the quality attributes of gluten-free bread using different concentrations (0, 20, 40, 60 and 80ppm) of all maltogenic  $\alpha$ -amylase (MA) and xylanase (XY) compared with wheat flour Balady bread and untreated gluten-free Balady bread (GFBB). Pasting properties, falling number, water activity, alkaline water retention capacity (AWRC) and sensory properties (fresh bread, after 24h, after 48h and after 72h) of gluten-free bread were evaluated. Additionally, the effect of merging different concentrations of maltogenic  $\alpha$ -amylase and xylanase on staling behavior (AWRC) and sensory properties of gluten-free Balady bread was investigated. The addition of MA led to a gradually decreased peak viscosity, breakdown, setback and pasting temperature of GFBB with the increasing level of MA. Maltogenic  $\alpha$ -amylase and xylanase addition led to a reduction in the FN values compared to the untreated gluten-free sample, noting that the MA-treated samples showed a significant decrease compared to the XY-treated and untreated samples. Wheat flour Balady bread significantly showed a higher value of AWRC compared to untreated gluten-free Balady bread at different storage periods (zero time, after 24h, after 48h and after 72h). MA-treated samples showed higher water binding capacity and water activity (aw) in comparison with XY-treated samples, with significance during all storage periods. Concerning the overall acceptability during the third day, the highest score (4.6) was observed by the GFBB sample containing 40ppm MA, followed by 4.3, which was investigated by the GFBB sample containing 80ppm XY with no significance between them and with significance compared to the other samples.

**Keywords :** celiac disease, gluten-free products, anti-staling agents, maltogenic  $\alpha$ -amylase, xylanase

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