

The Impact of Enzymatic Treatments on the Pasting Behavior and Its Reflection on Stalling and Quality of Bread

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Abstract : The problem of bread stalling is still one of the most troubling problems for those interested in manufacturing bakery products, as increasing the freshness period of bread is considered one of the most important factors that help encourage this industry due to its important role in reducing expected losses. Therefore, this study aims to improve the quality of pan bread and increase its freshness period by enzymatic treatments, including maltogenic α -amylase (MAA), amyloglucosidase (AGS), glucoseoxidase (GOX) and phospholipase (PhL). Rheological and pasting behavior of wheat flour were estimated in addition to the physical, texture, and sensory parameters of the final product. The addition of MAA resulted in a decrease in peak viscosity, breakdown, setback, and pasting temperature. The addition of MAA also led to a reduction in falling number values. Enzymatic treatments (MAA and PhL) exhibited higher alkaline water retention capacity of pan bread compared to untreated pan bread (control) throughout different storage periods. Furthermore, other enzymes displayed varying effects on bread quality; for instance, AGS enhanced the crust color, while a high concentration of GOX improved the specific volume of the bread. Conclusion: The research findings demonstrate that the enzymatic treatments can significantly improve its quality attributes, such as specific volume, increase the alkaline water retention capacity with lower hardness value, which reflects bread freshness during storage periods, and improve sensory characteristics.

Keywords : anti-stalling agents, enzymatic treatments, maltogenic α -amylase, amyloglucosidase, glucoseoxidase, phospholipase, pasting behavior, wheat flour

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