

Title Study of lipoxygenase and peroxidase as indicator enzymes in green beans: change of enzyme activity, ascorbic acid and chlorophylls during frozen storage

Author K. Savaş Bahçeci, Arda Serpen, Vural Gökmen and Jale Acar

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Abstract

Effects of two blanching conditions using peroxidase (POD) and lipoxygenase (LOX) as indicator enzyme on residual enzyme activities, ascorbic acid and chlorophyll content in green beans during frozen storage were studied. No reactivation of both LOX and POD enzyme was observed during storage. The losses of ascorbic acid and chlorophylls during storage followed first order kinetics. Half-life of ascorbic acid in unblanched green beans was determined to be 1.89 months. It increased to 2.15 and 3.48 months by blanching at 70 °C for 2 min (for >90% LOX inactivation) and 90 °C for 3 min (for >90% POD inactivation), respectively. Half-lives of chlorophyll *a* (Chl *a*) and chlorophyll *b* (Chl *b*) were determined to be 7.32 and 13.11 months in unblanched green beans. Blanching green beans at 70 °C for 2 min decreased the half-lives of Chl *a* and Chl *b* to 5.05 and 10.09 months while blanching at 90 °C for 3 min increased to 8.26 and 16.70 months, respectively. The results clearly showed that a blanching treatment to inactivate POD retains the quality attributes of green bean better during frozen storage.