

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

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Abstract

In this study, the effects of different blanching conditions on residual lipoxygenase (LOX) and peroxidase (POD) activities and quality changes in peas during frozen storage were studied. Peas were analysed for LOX and POD activities, ascorbic acid and chlorophylls *a* and *b* contents at 1, 2, 3, 6, 9 and 12 months of frozen storage. No regeneration of LOX and POD activities was determined in frozen-stored peas at $-18\text{ }^{\circ}\text{C}$. The degradations of ascorbic acid and chlorophylls followed first-order kinetics. The half-lives of ascorbic acid, chlorophylls *a* and *b* derivatives in unblanched peas were found to be 3.30, 14.01 and 36.76 months during storage, respectively. Blanching at both $70\text{ }^{\circ}\text{C}$ for 4.0 min and $80\text{ }^{\circ}\text{C}$ for 2.0 min increased the half-life of ascorbic acid while it decreased those of chlorophylls *a* and *b*. Overall results suggested a blanching time of 2.0 min at $80\text{ }^{\circ}\text{C}$ to inactivate 90% of initial POD activity, so, to retain quality parameters such as ascorbic acid and chlorophyll pigments in a storage period of 12 months at $-18\text{ }^{\circ}\text{C}$.