

Title Development and validation of a model to predict enzymatic activity during storage of cultivated mushrooms (*Agaricus bisporus* spp.)

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Abstract

Post harvest browning of mushrooms is attributed to endogenous enzyme activity, such as polyphenol oxidase (PPO) and peroxidase (POD). PPO and POD activities were measured for different batches of mushrooms stored under different temperature conditions. A four parameter logistic model was used to describe the enzymatic activity responsible for browning in mushrooms, involving the transition between a low-activity state and a high-activity metabolic state. Storage temperature was found to affect the time at which the transition occurred and the rate of the phenomena. A random effect term was incorporated in the model to describe the effect of batch-to-batch variability of the mushrooms. A multi-response error term was also included in the model to differentiate the variance in the two enzymes. The non-linear mixed effect model adequately described the enzymatic activity (PPO and POD) kinetics for different storage temperatures.