Abstract

In-container pasteurization of pickled cucumbers deactivates enzymes and spoilage microorganisms with minimal organoleptic changes when packed in small jars. As jar volumes increase, pickle quality is affected as a result of longer pasteurization times setting the practical volume limit to 3.8 L. Alternatively, this paper proposes out-of-container pasteurization followed by packaging in sanitized containers. This study, including only the pasteurization step, was conducted with a discontinuous pasteurization device using variable cucumber diameters, brine temperatures, and flows. Heat penetration data was fit to a mathematical model with the enzyme peroxidase as a parameter of pasteurization effectiveness. Results showed that heat transfer was dominated by internal resistance, and according to the model, enzyme deactivation depended on the cucumber diameter, and brine temperature, but not on the brine flow. A 5-log reduction in peroxidase activity in the center of the cucumbers required 1.4 times longer than the equivalent treatment in the whole pickle.