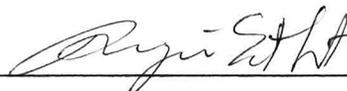Peeriya Kiatchanapaiboon 2007: Shelf Life Predictive Modeling of Minimally Processed Asparagus in the Polymeric Modified Atmosphere Package. Master of Engineering (Food Engineering), Major Field: Food Engineering, Department of Food Engineering. Thesis Advisor: Assistant Professor Rungsinee Sothornvit, Ph.D. 93 pages.

Washing is an important process to reduce the initial microbial load; thus, it can prolong the quality and shelf life of asparagus. Minimally processed green asparagus (*Asparagus officinalis*, L.) soaked in 100 ppm chlorinated water at 10 °C for 15 min resulted in reduction of 2.16 log CFU/g aerobic plate count and no detection of *Escherichia coli* from the cultivated source of contamination. Clean asparaguses were stored in the modified atmosphere oriented polypropylene bag with 21% and 9% of initial oxygen and carbon dioxide concentration, respectively. The results showed that the storage temperature significantly affected the hue angle but it did not affect the fiber content of asparagus. The change of the hue angle followed a first – order chemical kinetics. Moreover, it exhibited the linear correlation with the overall appearance quite well. The activation energy obeyed the Arrhenius relationship for the hue angle change of asparagus was 29.38 kJ/mol. Temperature (T) dependence of the shelf life (t_s) predictive modeling based on the overall appearance scores was $t_s = 10^{\left(3420.5(\frac{1}{T})-10.99\right)}$. The predicted value by using this model agreed very well with the experimental data of asparagus storage at 4 °C of temperature. The changes of oxygen and carbon dioxide concentrations of asparagus in the package headspace were predicted from the mathematical model depending on the gas permeabilities of the package and the respiration behavior based on the Michaelis-Menten uncompetitive inhibition type equation during storage. It was found that the mathematical model provided the equilibrium of both gases faster than the experimental data.

Peeriya K.	_(signature)_ 21 / 03 / 07
Student's signature	Thesis Advisor's signature