

Benjawan Kingkaew 2011: Packaging Technology for Asparagus and the Application of Analytical Hierarchy Process (AHP) for Retail Package Design. Master of Science (Packaging Technology), Major Field: Packaging Technology, Department of Packaging and Materials Technology. Thesis Advisor: Associate Professor Vanee Chonhenchob, Ph.D. 145 pages.

Controlled atmosphere (CA) storage and modified atmosphere packaging (MAP) and the applications of analytical hierarchy process (AHP) for retail package design were studied for asparagus. The oxygen and carbon dioxide tolerances of asparagus were 10 kPa and 20 kPa, respectively. The optimum CA for asparagus stored at 2 °C was 15 kPa O₂ + 15 kPa CO₂. The longest shelf-life was 30 days. The limiting factors of asparagus stored in CA were yellow stalk shrinking and soft rot disease. Asparaguses were packaged in the bags and the polypropylene (PP) trays sealed with various high gas permeable films (NPPE-11 and NPPE-16), compared with the commercially available film (NPPE-05). The results showed that asparaguses packed in the PP tray sealed with NPPE-16 could maintain the longest shelf-life of 35 days. The in-package atmosphere of the PP sealed with NPPE-16 at equilibrium was 3-5 kPa O₂ + 3-5 kPa CO₂.

The Applications of AHP for retail package design was studied. The primary criteria of the retail packages were found to be the ability to clearly display the packed vegetables, the item to identify the quality loss of the packed vegetables and the ability to preserve the quality and extend the shelf-life of the packed vegetables. The retail package that meets the most satisfaction of the consumers was the tray sealed with the plastic film that can extend the shelf-life of the fresh vegetables (41.80%). The results from AHP were used to compare with the survey results of the retail packages used for vegetables in Thailand and Taiwan's markets. The survey results showed that the tray sealed with plastic films was the most popular retail package for asparagus. The AHP results suggest that the tray sealed with plastic films was the most popular retail package for asparagus. The AHP results suggest that the tray sealed with plastic films that could extend the shelf-life of the packed vegetables should be a retail package that meets consumers' demand.

Student's signature

Thesis Advisor's signature