

Abstract

A study was conducted to determine if the pressure reduction rate in a vacuum cooler would have an effect on the physical and chemical quality characteristics as well as the ultrastructure of iceberg lettuce after cooling and storage. Three different pressure reduction rates were taken to cool iceberg lettuce in a vacuum cooler. Subsequently, vacuum cooled lettuce were stored at 1 °C and 85% relative humidity (RH) for 2 weeks. The changes of mass, firmness, ascorbic acid, chlorophyll, catalase, and ultrastructure were measured throughout the storage period to decide the quality variation induced by different pressure reduction rates. The results of physical and chemical tests agreed well with the result of transmission electron microscopy (TEM), which showed that the moderate pressure reduction rate achieved the maximum values of tissue firmness, ascorbic acid and catalase. Membrane systems observed by TEM under the moderate pressure reduction rate were kept intact compared to the other two pressure reduction rates. The moderate pressure reduction rate achieved the best quality and shelf-life of iceberg lettuce.