

Title Control of water condensation and effects of perforation of the plastic film of the sealed package on spoilage of fresh produce

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Abstract

Artificial environment with relatively high water potential of the air is essential for preservation of fresh produce. Packaging in plastic films is one of the ways to diminish the water potential gradient between the produce and its environment. However, under near-saturation conditions inside the package, even minor temperature fluctuations may result in precipitation of condensed water. Water condensation is a great risk in the handling of perishable produce leading to enhanced decay and reduced visibility of the attractiveness of fruit. The major challenge of modified-humidity packaging (MHP) is finding solutions for reducing the risk of water condensation, while still maintaining the produce water loss as low as possible. The method of individual shrunk seal packaging provides a standard of MHP efficacy controlling condensation practically without compromising the high in-package humidity. Other MHP approaches are based on a compromise principle, when the humidity level inside the package is low enough to prevent condensation, but still is high enough to reduce the water loss as compared to the produce without a plastic packaging. Water condensation was practically eliminated in packages of mango, bell pepper and citrus fruits by the following means: Perforation of the plastic film of the MA package, using proper film that has a much greater permeability to water than conventional films such as polyethylene, and/or the insertion of hygroscopic materials into the MA package. In addition to the removal of water condensation perforation of the plastic film of the MA package allows many of the good results of MAP in reduction of water loss and alleviation of water stress without the possible deleterious effects of anaerobiosis such as off-flavors, fermentation and carbon dioxide damage.