Title Managing airflow inside reefer containers benefits produce quality

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Abstract

Refrigerated shipping containers are becoming the preferred means of transporting fresh produce to distant markets, with their market share over specialised refrigerated ships, increasing year on year to around sixty percent. The design of these containers originated in the 1980's and there have been no fundamental changes to the internal architecture of the containers in the ensuing years. The product temperatures and relative humidity within the containers often deviates from the ideal simply due to the limitations of the design and the way the packaging material interacts with the air delivery system. The product temperature management within specialised refrigerated ships is known to be more accurate and even when compared to that in containers. In an effort to improve this shortcoming, ways of bettering the delivery and return airflow within containers have been tested. Trials have been conducted in a container in which the internal architecture has been changed to redirect the way the chilled air is delivered to the product and how the return air is collected. In turn trials have been done to measure how these changes impact on fruit temperatures and quality. These changes, when compared in back to back trials with a standard container, show that the pulp temperatures of various fruit kinds can be kept closer to the optimum set point. In addition the relative humidity levels within the storage air can be increased to over 90%. These improvements in storage conditions benefit the storage quality of various fruits. Results from trials on apples, pears and citrus fruits will be discussed along with the additional benefits modal shipping brings to long distance cold supply chains.