Title Vacuum cooling for the fruit and vegetable industry

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Abstract

Purpose of review: This review focuses on the state-of-the-art of vacuum cooling in the fruit and vegetable industry, with the objective of highlighting areas that require further research.

Findings: Recently, there has been renewed research interest into vacuum cooling. Research on the vacuum cooling process for fruits and vegetables can be divided into three subcategories: optimisation of vacuum cooling, product quality and mathematical modelling of the process. There has been some research into the optimisation of the vacuum cooling process to minimise mass loss as well as to determine the peak refrigeration loads. Although the bulk of the research papers focus on the effects of vacuum cooling on product quality, several unanswered questions remain. Additionally, only recently have articles on mathematical modelling of the vacuum cooling process emerged.

Directions for future research: Each of the three subcategories mentioned above requires further research. The industry would benefit from articles on improved engineering, detailing the optimal design of each of the components of a vacuum cooler; which may help to reduce capital costs and increase energy efficiency. There are also several areas of product quality that need further exploration. One of these is the effect of the vacuum on plant tissue, and how this affects the keeping quality of the product.