

Title Controlled atmosphere storage and aroma volatile production
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Citation Stewart Postharvest Review, Volume 2, Number 5, October 2006, pp. 1-8(8)
Keyword Volatiles; controlled atmosphere; ethylene; aroma; flavour

Abstract

Purpose of the review: The techniques and principles of controlled atmosphere (CA) storage have been well explored for many fruits and vegetables, especially for temperate zone fruits, with emphasis on supplying the consumer with “fresh” fruit for as much of the year as possible. It is now recognised that commercial application of CA storage benefits retention of visual quality (appearance) the most, followed by firmness retention, while the lowest benefit is retention of flavour, especially the aroma components of flavour. With the increasing ability of the industry to satisfy appearance and firmness demands in the marketplace, increasing market attention is being placed on the aroma properties of the fruit or vegetable. Therefore, this review focuses on the influence of CA storage on product aroma production.

Findings: There is a considerable amount of information on the identification of the major volatile components in the aroma of several fruits. However, as in any relatively new field, there are substantial qualitative differences in the volatile composition reported by different research groups. Recently, more emphasis has been put on going beyond mere identification of the volatile composition and to understanding the changes in volatile composition. This will positively affect not only CA storage techniques but also our understanding of the physiology behind ripening and storage.

Limitations/implications: Production and storage practices are subject to increasing scrutiny by consumers and researchers since more sensitive instrumental analysis equipment and techniques now make it possible to describe the influence of storage practices on volatile production and aroma of the product. Nevertheless, due to the substantial qualitative differences in volatile composition it is still difficult to compare results from different groups. Furthermore, the balance between the different volatiles is a very precise science, with similar or even the same volatiles being important in very different types of fruit, as well as different levels found in different regions, cultivars and years. Thus, caution is required when using this knowledge to adjust storage conditions.

Directions for future research: Identification of the volatile composition of fresh and stored fruit and understanding the changes in storage is far from complete. More research in the

field is definitely needed and will undoubtedly improve not only CA storage techniques but also the understanding of the physiology behind ripening and storage in general. Considering aroma-active compounds rather than all volatiles will be much more meaningful to the quality of the fruit.