

Title Modified and controlled atmosphere reefer container transport technologies
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Abstract

Purpose of review: This review describes the commercially available modified and controlled atmosphere (MA and CA) technologies used in conjunction with container refrigeration systems to maintain the quality of fresh produce during sea transport.

Limitations: The review is based on transport refrigeration knowledge built over 17 years while working for a leading manufacturer (Carrier Corporation), a steamship line (Sea-Land Services) and leasing companies (Carlisle Leasing International & Transamerica Leasing). Being a marine systems engineer by degree, all positions held were technical in nature and a lot of time was spent in the field with colleagues, customers, suppliers, vendors, researchers and consultants working to improve and grow reefer business.

Implications: Market acceptance and use of the subject equipment has been extremely successful for specific commodities and tradelanes. Surprisingly, less than 2% of the world's fleet of refrigerated containers are fitted with "stand-alone" CA technology. However, thanks to improved box construction, approximately 25% of today's fleet is capable of MA or CA services. The biggest challenges to steamship lines in working to provide MA and CA services to their customers include equipment control issues, operations issues, the cost of equipment and the need for in-house technical expertise.

Directions for future research: It is clear that transportation equipment fitted with today's MA and CA systems can offer postharvest benefits to many commodities. The produce industry is well educated, and continues to innovate and grow the market, albeit slowly. With the variety of atmosphere service choices available, it would help if researchers could quantify the value of each system to commodities being shipped. Since even the most advanced CA system available to shippers has limitations over that of laboratory- or land-based systems, comparative studies using the "actual equipment" available to the market would benefit all. With quantifiable data, the market would move towards using the best services available, better maintaining the quality of produce and improving everyone's bottom line.