

Title Pressure treatment for increasing fruit and vegetable qualities
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Abstract

Purpose of the review: Because of growing concerns regarding healthy eating habits, consumer demand has increased for fresh fruits and vegetables that are free from chemical residues. In some cases, physical treatments, such as heat, ultraviolet and pressure treatment, are good alternatives to chemical treatment that can be used to maintain, and sometimes increase, fruit and vegetable quality. Pressure treatment has been used mainly to inactivate microorganisms on ready-to-eat foods and in beverages. The purpose of this review is to highlight the need for information related to the use of pressure treatment on fresh fruits and vegetables.

Recent findings: High pressure treatment is now used in the processing industry for many purposes. Low pressure methods, such as hyperbaric and hypobaric treatments, are also used for fresh fruits and vegetables, mainly for removing field heat through vacuum precooling, or for low and modified atmosphere packing. Recently, embryonic results were obtained using low pressure to influence physiological mechanisms of horticultural produce, but commercial application has not yet been reported.

Limitations/implications: The limitations of using high pressure techniques on processed food are: (1) that high pressure must be safely and repeatedly generated in the vessel and; (2) that there are relatively high capital costs for equipment. The limitations of using low pressure on fresh fruits and vegetables are that there is no expected direct effect on pathogen inactivation and the evidence of important beneficial effects remains to be demonstrated.

Direction for future research: Many reports have dealt with the use of very high pressures to inactivate microorganisms in processed food. Other studies have reported changes in the physiological status of treated fruits or vegetables. Future research should focus on the use of pressure not only to inactivate microorganisms and enzymes but also to create stress, which can alter physiological processes involved in ripening, disease resistance and the synthesis of secondary metabolites. Optimum pressure must be determined and beneficial effects must be demonstrated in order to support the hypothesis that pressure treatments from 0 to 1 MPa are commercially applicable for enhancing fruit and vegetable quality.