

Title Inactivation of *Saccharomyces cerevisiae* in conference pear with high pressure carbon dioxide and effects on pear quality

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Abstract

This work explores the use of high pressure carbon dioxide (HPCD) for the inactivation of *Saccharomyces cerevisiae* in fresh-cut conference pears. This fruit was chosen as an example of a ready to eat and minimally processed food. Assays were carried out with continuous CO₂ flow at different pressures (6–30 MPa), temperatures (25–55 °C), and exposure times (10–90 min). Heat treatments at similar temperatures and times were compared to the use of HPCD, wherein it was observed that HPCD was more effective. The total inactivation (5 log₁₀ cycles) of the yeast took place at 55 °C with HPCD while it was necessary to reach 70 °C when only heat was applied. Required pressures and exposure times were relatively low (≤6 MPa and on the order of minutes) because of the direct contact between the CO₂ and the pear. The pH and °Brix were not affected by the HPCD treatment; however, the pears lost their texture and became darker due to a decrease in vitamin C and enzymatic browning. Peroxidase activity was only partially reduced. The addition of an antioxidant did not help to prevent darkening. Therefore, HPCD could be a low temperature conservation method that is superior to conventional thermal treatments for the preparation of fruit preserves where a firm texture is not essential.