

Abstract:

High natural loads of microorganisms on fresh vegetables justify antimicrobial treatments of minimally processed vegetables. We evaluated the efficiency of the following chemical and physical decontamination methods on cut cabbage and carrot: washing in distilled water, disinfection by hydrogen peroxide (500 ppm), chlorine (100 ppm), peroxyacetic acid (500 ppm), high-pressure at 300, 400 or 500 MPa, water steam and hot air. Microbiological analyses, ascorbic acid determination and sensorial evaluation were carried out just after processing and after 5 days in cold storage. Counts of total mesophilic organisms (TMO), coliforms (C) and yeasts and moulds (M) were determined using the standard methods, HPLC was used for ascorbic acid determination. Microbial contamination after water washing was assessed as TMO 10^4 - 10^6 /g, C 10^3 - 10^5 /g, M 10^2 - 10^5 /g. Disinfectants in the washing bath reduced the microbial loads 100-fold maximum, the peroxyacetic acid was the most efficient. The five-day storage led to the re-growth of microbes, the counts increased about 1 log₁₀ in cabbage and 2 log₁₀ in carrots. High-pressure treatment reduced significantly the counts; application of 500 MPa led to total microbial inactivation even after two-weeks' storage. No decontamination effect was found after steaming. Retention of ascorbic acid varied from 50 to 70% and the losses increased with storage duration. No significant sensorial changes were detected after chemical treatments, while physical treatments led to changes in appearance and texture.