Abstract:

This paper reports on the development of alternative washing treatments to extend the quality and safety of fresh cut-vegetables and improve their nutritional value. Washing with Ca-lactate (3%) prevented the bleaching effect on salad-cut lettuce and sliced carrots and the appearance of whiteness on the second one normally associated with sodium hypochlorite washing solutions (120 ppm Chlorine). Ca-lactate maintained and enhanced nutritional values during storage, especially in carrots. Sliced carrots treated with Ca-lactate had significant ($p<0.05$) higher levels of carotenoids (antioxidant capacity) than Chlorine treated carrots at the end of 10-day storage. Also, ascorbic acid content was significantly ($p<0.05$) higher in samples treated with Ca-lactate than in Chlorine-treated lettuce and carrots. Optimisation studies of Ca-lactate treatments showed high temperature (50ºC) at the studied range of concentrations (0.5-3%) significantly ($p<0.05$) reduced PPO- and POD-mediated browning in salad-cut lettuce when compared with 4ºC and 25ºC treatments. Washing solution containing dissolved O_3 at 25ºC was compared with Ca-lactate solution at 50ºC. Samples treated with O_3 (alone and combined with Ca-lactate at 50ºC) had significantly lower PPO values than Ca-lactate treated samples. Whey permeate (0.5-3%) washing treatments significantly ($p<0.05$) reduced the levels of PPO and POD activity in salad-cut lettuce and sliced carrots when compared with Chlorine treatment. The alternative washing treatments tested showed good quality retention and microbial loads in the processed vegetables and maintained the nutritional value as good as or better than Chlorine treatment.