

Title Effect of calcinated calcium washing solution and heat treatment on quality and microbial reduction of fresh-cut leafy vegetables

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Abstract

The heated scallop shell powder; calcinated calcium (1.5 g.L^{-1}) alone or in combination with heat treatment (45°C for 2 min) were investigated as potential sanitizers for maintaining quality and microbial safety of fresh-cut leafy vegetables (iceberg lettuce, broccoli, baby pok choi, and pok choi microgreens) compared with $50\mu\text{L.L}^{-1}$ chlorine. Quality and safety parameters of fresh-cut leafy vegetables packaged in $80 \mu\text{m}$ nylon/polyethylene bags were monitored during storage at 5°C . Washing in calcinated calcium at 17°C (normal water temperature) was effective in reducing microbial population of fresh-cut lettuce and broccoli up to the 12 days of storage as well as chlorine treatment. However, calcinated calcium washing at 17°C was only effective in reducing microbial population of baby pok choi and microgreens until 4 and 2 days, respectively. The use of calcinated calcium combined with heat treatment increased an electrical conductivity of fresh-cut lettuce and broccoli tissue. Combined heat treatment with washing solutions reduced aerobic plate count and coliform counts on fresh-cut iceberg lettuce and broccoli, only in initial period of storage. However, heat treatment induced of fresh-cut leafy vegetables resulting more microbial population compared to non heat treatment. Samples treated with calcinated calcium had good quality with low off-odor at the end of storage. The results suggest that calcinated calcium could be an alternative to chlorine as an environment-friendly sanitizer for washing of fresh-cut leafy vegetables without affecting sensorial quality.