

Effects of Selected Disinfecting Agents on the Microbial Quality and Physical Characteristics of Fresh-Cut Carrots (*Daucus Carota*)

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The microbial contamination of fresh-cut vegetables presents a significant public health concern, as it can lead to foodborne diseases such as listeriosis and salmonellosis. As consumer surveys indicate consumers preference for organic acids/natural disinfecting agents in fresh-cut vegetables, the current study investigated the effect of such disinfectants on microbial quality, colour, and pH of fresh-cut carrots. The disinfecting solutions of H₂O₂ (0.25 and 0.5%), NaCl (5.0 and 10.0%), citric acid (1.0, 1.5 and 2.0%), and acetic acid (1.0, 1.5 and 2.0%) was prepared. For each treatment, 10 g of washed, topped, peeled, and sliced carrots were dipped in the solution for 5, 10, or 15 minutes resulting in 33 treatments. The treated carrot samples were analyzed in duplicates for total plate count (TPC), total coliform count (TCC), yeast and mold count (YMC), color (L*, a*, b*, hue and chroma), and pH. A factorial ANOVA evaluated the effect of concentration and dipping time (DP) of each disinfectant on the above parameters ($\alpha=0.05$). Both the concentration and DP of NaCl significantly affected the colour of carrots while higher concentration (1.9×10^4 vs. 5.5×10^3 CFU/g) and DP (1.9×10^4 vs. 7.0×10^3 CFU/g) resulted in a significantly lower YMC. There was a significant effect of both concentration and DP of citric acid as well as acetic acid on colour, and pH of carrots. Increasing concentration and/or DP in citric acid resulted in a significantly lower TPC compared to lower concentration or DP. Similar relationship was observed with acetic acid as the disinfectant. Disinfecting with H₂O₂ significantly affected the color of carrots while higher concentration (1.6×10^4 vs. 1.3×10^4 CFU/g) and DP (1.7×10^4 vs. 1.3×10^4 CFU/g) of H₂O₂ resulted in a significantly lower TCC. Thus, it can be concluded that the microbial quality, color and pH of fresh cut carrots depends on the concentration the disinfectant and DP.

Keywords: Acetic Acid, Citric Acid, Hydrogen Peroxide, Safety, Sodium Chloride

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