

TITLE: BRUSHING AND SODIUM HYPOCHLORITE COMBINATION IN SANITATION OF CARROTS INTENTIONALLY CONTAMINATED WITH *ESCHERICHIA COLI*

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ABSTRACT:

The Brazilian government recommends the consumption of unpeeled and *in natura* vegetables and fruits, as well as sustainable food production practices to promotion of healthy nutrition. To ensure microbiological food safety, current legislation regulates sanitation processes, comprising the steps of washing, immersion in chlorine solution and rinsing. However, when considering the recent recommendation of eating unpeeled vegetables, the presence of soil adhered to irregularities on the vegetable surfaces make it difficult the effective action of the recommended procedures. Therefore, the combination of chemical and physical methods may represent an alternative for increasing the efficiency of sanitation procedures to ensure safety food preparations. This research study aims at evaluating the effect of brushing associated with sodium hypochlorite treatment (200 mg/L for 10 min) on reduction of *E. coli* ATCC 11229 contamination of carrot. For this study, carrots were previously sanitized with sodium hypochlorite solution, intentionally contaminated with *E. coli* (6.5 ± 0.3 log CFU/g) and treated in two different ways: 1) washed with water and sanitized in sodium hypochlorite solution; 2) brushed three times with water and sanitized in sodium hypochlorite solution. Three biological (independent) experiments were performed with three replicates each. The results are presented as averages and standard deviations. Samples were microbiologically analyzed after each step of the process. One-way ANOVA followed by *post hoc* Tukey's test was used for statistical analysis. *In natura* samples previously sanitized with sodium hypochlorite had an initial total coliform count of 4.4 ± 0.7 log CFU/g. The washing with water and sanitization with sodium hypochlorite reduced viable cell count by 1.6 ± 0.3 log CFU/g ($p < 0.0001$). However, a reduction of 2.3 ± 0.1 log CFU/g ($p < 0.0001$) was observed for brushing only, and of 3.0 ± 0.1 log CFU/g ($p < 0.0001$) for the combination brushing-sanitizing solution. Our data demonstrate that the association of a physical method to the sanitization can intensify the cleaning effect in the removal of *E. coli* from carrot peels. Complementary research studies are being carried out with other vegetables types and sanitization strategies to gain a greater understanding on the efficiency of sanitation methods that guarantee the microbiological safety consumption of *in natura* vegetables against foodborne pathogens.

Keywords: peels, carrots, sodium hypochlorite, sanitation, brushing, *Escherichia coli*.

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