

Bacterial survival related to free chlorine concentration

US microbiologists published the first report on the strong correlation between the survival of aerobic bacteria and free chlorine (FC) concentration in the wash water of fresh-cut vegetables. The study focused on Romaine lettuce, Iceberg lettuce and cabbages.

Overall, the organic material load gradually increased over time as more and more produce was washed using the same water. The type of product and production volumes significantly affected organic material load increase rate. The survival of aerobic mesophilic bacteria in wash water, which is strictly related to FC concentration, was analysed during operations with all three vegetables regardless of the organic load in the wash water. In the majority of cases, bacteria survived when FC concentration was below 10 mg/L (=10 ppm) and especially when it was below 5 mg/L.

The increase in FC concentration led to a considerable drop of the frequency and population of bacteria detected. These results highlight the importance of maintaining a sufficient free chlorine concentration to prevent bacterial survival and cross contamination.

Determining a minimum effective free chlorine concentration to prevent pathogen survival and cross contamination is essential to develop food safety practices based on risk and scientific knowledge.

The correlation between FC dynamic concentrations and bacterial survival was studied during the commercial washing of chopped Romaine lettuce, shredded Iceberg lettuce and diced cabbage. The wash water was sampled every 30 minutes and assayed for organic loading, FC and total aerobic mesophilic bacteria after chlorine neutralisation.

Water turbidity, chemical oxygen demand and total dissolved solids increased considerably over time, even more so with cabbage. FC concentration fluctuated in response to chlorine dosage rates, product loading and water replenishment. Total bacterial survival showed a strong correlation with real-time FC concentration.

This study confirms that maintaining at least 10 mg/L of FC in the wash water strongly reduces the probability of bacterial survival and therefore the risk of cross-contamination.

Lien article : <http://www.freshplaza.com/article/185397/Bacterial-survival-related-to-free-chlorine-concentration>