

Analysis of the variability in microbial inactivation by acid treatments

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Abstract

The variability in microbial inactivation through acid treatments was evaluated in the present study. *Enterococcus faecalis*, *Listeria innocua*, *Salmonella enterica*, and *Pseudomonas fluorescens* were inoculated in buffered peptone water, chicken soup, and citrate solution, and were subjected to acid treatments of various intensities to reach a microbicidal effect of 0, 2, 3, and 4 logarithmic cycles. The variability in the number of survivors was greater in treated than in untreated samples. Furthermore, the effect of acid treatment on survival variability depended on the intensity of the acidification. More specifically, as the intensity of the applied acid treatment increased, the number of viable microorganisms, although smaller, was more variable. The results of this study indicate that the inactivation behaviour of microbial cells within a population is subject to variation; such variability must be quantified and taken into account in predictive food microbiology, and it can be valuable for risk assessment purposes when acidification of food is involved.