Survival and inhibition of *Staphylococcus aureus* in commercial and hydrated tahini using acetic and citric acids

Amin N. Olaimat a, *, Anas A. Al-Nabulsi b, Tareq M. Osaili b, Murad Al-Holy a, Mutamed M. Ayyash c, Ghadeer F. Mehyar d, Ziad W. Jaradat e, Mahmoud Abu Ghoush a

**ABSTRACT**

Tahini (sesame paste) is a low-moisture ready-to-eat food that has been linked to foodborne outbreaks and recalls. The objectives of this study were to investigate the behavior of *Staphylococcus aureus* in commercial and hydrated tahini at 10, 21 and 37 °C and to inhibit *S. aureus* in these products by 0.3 and 0.5% acetic or citric acid. *S. aureus* was able to survive in commercial tahini with reductions of 1.6 and 0.7 log10 CFU/g at 37, 21 and 10 °C, respectively; while it grew in hydrated tahini with an increase of 3.9, 3.0 and 1.8 log10 CFU/ml at 37, 21 and 10 °C, respectively, by 28d. Citric or acetic acid at ≤ 0.5% reduced *S. aureus* in commercial tahini by ≤ 2.3 log10 CFU/ml by 28d compared to control at all of the tested temperatures. However, acetic and citric acid were more inhibitory at 37 and 10 °C, respectively. In hydrated tahini, viable *S. aureus* cells were not detected in the presence of 0.5 or 0.3% acetic acid after 7 and 14d, respectively, at both 21 and 37 °C, and after 14 and 28d, respectively at 10 °C. Acetic acid at 0.1% also reduced *S. aureus* numbers to undetectable levels after 14 and 28d at 21 and 37 °C, respectively. *S. aureus* cells were also not detected in the presence of 0.5% citric acid by 21d at all of the tested temperatures, or 0.1 and 0.3% citric acid by 28 and 21d, respectively at 21 °C. Acetic and citric acid could be used in tahini or tahini-based products to reduce the potential risk associated with *S. aureus*.

© 2017 Elsevier Ltd. All rights reserved.