Use of acetic and citric acids to control Salmonella Typhimurium in tahini (Sesame Paste)

Abstract

Since tahini and its products have been linked to Salmonella illness outbreaks and product recalls in recent years, this study assessed the ability of Salmonella Typhimurium to survive or grow in commercial tahini and when hydrated (10% w/v in water), treated with 0.1%–0.5% acetic or citric acids, and stored at 37, 21 and 10 °C for 28 d. S. Typhimurium survived in commercial tahini up to 28 d but was reduced in numbers from 1.7 to 3.3 log$_{10}$ CFU/ml. However, in the moist or hydrated tahini, significant growth of S. Typhimurium occurred at the tested temperatures. Acetic and citric acids at ≤0.5% reduced S. Typhimurium by 2.7–4.8 log$_{10}$ CFU/ml and 2.5–3.8 log$_{10}$ CFU/ml, respectively, in commercial tahini at 28 d. In hydrated tahini the organic acids were more effective. S. Typhimurium cells were not detected in the presence of 0.5% acetic acid after 7 d or with 0.5% citric acid after 21 d at the tested temperatures. The ability of S. Typhimurium to grow or survive in commercial tahini and products containing hydrated tahini may contribute to salmonellosis outbreaks; however, use of acetic and citric acids in ready-to-eat foods prepared from tahini can significantly minimize the risk associated with this pathogen.