
Abstract No. 40

PaperTitle **Investigating the Sustainability of Organic Acids as Food Preservatives**

Main Author **Theron MM Dr**

Presentor **Theron MM Dr**

*Central University of Technology Unit for Applied Food Science and Biotechnology Bloemfontein SOUTH AFRICA
mtheron@cut.ac.za*

Co-Authors

ABSTRACT

Organic acids have for many years been valuable food preservatives, but limited data are available on their effectiveness in commercial practice. Extensive use of organic acids is suspected of resulting in bacterial adaptation and also emergence of acid tolerance, which could enable food-borne pathogens to overcome the protective barrier of the gastric stomach. Because of their many advantages it is crucial that organic acids be revisited as preservatives, preventing them becoming obsolete. The aim of this study is to assess susceptibility of food-associated bacteria for organic acids and determine possible mechanisms implicated in resistance development.

Antimicrobial profiles against 15 organic acids were compiled for 138 isolates, comprising 36 standard food-borne pathogen strains, 70 environmental isolates and 32 isolates from meat. Minimum inhibitory concentrations were determined with an agar-dilution method. Induction of resistance in susceptible strains was done by exposure to increasing concentrations organic acid. Protein profiles were then determined by SDS-PAGE to compare profiles of susceptible strains with profiles of resulting resistant mutants. A bio-assay test was developed to screen for enzymatic activity against organic acids.

MIC values of standard strains were relatively high, especially for sorbic, capric, benzoic and lactic acids and various changes in protein profiles in resistant strains were evident. In addition, specific enzymatic activity were detected. Various factors should be taken into consideration when measuring effectiveness, but if MICs of standard strains not previously exposed to food preservatives, are so high, it might be alarming to learn the actual situation in organisms isolated from processed food.