

Title Electronic nose and fast GC for detection of volatiles from *Escherichia coli* 0157:H7, *Escherichia coli* and *Salmonella* in lettuce

Author A.Z. Bernal,c.c. Webb², M.C. Erickson²

Citation Abstracts of 7th International Postharvest Symposium 2012 (IPS2012). 25-29 June, 2012. Putra World Trade Centre (PWTC), Kuala Lumpur, Malaysia. 238 pages.

Keywords lettuce; *E. coli*

Abstract

Timely and accurate determination of the presence and nature of foodborne bacterial pathogens is very important in food safety. It is desirable to have methods that can quickly discriminate pathogens from non-pathogens whilst classifying correctly different isolates of the same pathogen. In this work we evaluated the potential of an electronic nose (DiagNose™) and a fast GC (zNose™) to detect and distinguish pathogens (*Escherichia coli* 0157:H7 and *Salmonella* spp.) from non-pathogens (*E. coli*). For each group of bacteria, three isolates were evaluated separately. All bacteria were grown in tryptic soy broth (TSB) at 37°C prior to inoculating lettuce samples with 10-20 bacterial cells. TSB supplemented with an amino acid mixture was added to the inoculated lettuce samples (2.5 g) prior to their incubation with shaking at 37°C for 8 hours. In a scale-up trial using 25 g of lettuce, sorbitol (0.2% final concentration) was also added to the inoculation medium. Final bacterial populations in the media ranged from 104.3 and 107.0 cfu/ml. After incubation, sample headspace was analysed with: (1) DiagNose™ a metal oxide sensor-based electronic nose (5 min analysis times) and (2) zNose™ a fast-GC with a 1m long DB-5 column and a surface acoustic wave sensor (30 sec analysis times). Principal component analysis of zNose™ data (areas of 13 peaks) showed that *E. coli* 0157:H7, non-pathogenic *E. coli*, *Salmonella* and a cocktail of all three bacteria grown in lettuce could be discriminated from each other, while different isolates of the same organism clustered together. DiagNose™ analysis could discriminate *Salmonella* from *E. coli*, *E. coli* 0157:H7, and the cocktail but failed to discriminate *E. coli* from *E. coli* 0157:H7.