

**P0654**

**Paper Poster Session**

**MDR Gram-negatives in food and the environment**

**Extended-spectrum beta-lactamase *Klebsiella pneumoniae* and carbapenemase-producing *Enterobacter* spp. in algae products marketed as health supplements**

Laura Ryan\*<sup>1</sup>, Maria Molloy<sup>2</sup>, Elaine Mcgrath<sup>2</sup>, Loretta Evans<sup>2</sup>, Angela Quinn<sup>2</sup>, Enda Burke<sup>2</sup>, Martin Cormican<sup>3</sup>

<sup>1</sup>*University Hospital Waterford, Microbiology, Waterford, Ireland*

<sup>2</sup>*University Hospital Galway, Galway, Ireland*

<sup>3</sup>*National University of Ireland Galway, Galway, Ireland*

**Background:**

There is a large market for a wide range of foods and food supplements that claim to provide benefits in maintaining health or in alleviating disease. Some such products may originate from small producers in distant parts of the world and receive minimal treatment. The products are frequently consumed in health shakes/drinks or sprinkled on other foods and as such are effectively “ready-to-eat”. Chlorella Powder, Spirulina and Super Greens are among the products marketed in a number of health food outlets. In early 2015 the Food Safety Authority of Ireland (FSAI) performed a national microbiological survey of food supplements in Ireland. Samples of food were collected from retail outlets and examined for *Salmonella* spp. *Salmonella enterica* serovar Rissen was detected in one sample of product sold as Organic Chlorella Powder. The batch of product and a number of related products were removed from the market. As contamination with *Salmonella* is indicative of faecal contamination we collected samples of similar products for examination for a wider range of faecal flora and to assess antimicrobial resistance of *Enterobacteriaceae* and enterococci isolated.

**Material/methods:**

Eight samples were available for testing: 5 Chlorella; 2 Spirulina; and 1 Super Greens. Samples were cultured for enteric flora. Isolates were identified by MALDI-TOF MS. Susceptibility testing was by EUCAST disk diffusion, and some resistance mechanisms were characterised by PCR.

**Results:**

All samples contained a range of *Enterobacteriaceae* and anaerobes. Three isolates of *Enterobacteriaceae* were ESBL-producers: 2 *K. pneumoniae*, one of which contained a CTX-M Group 9 ESBL; and 1 *Enterobacter kobei* containing an OXA-51 ESBL. *C. perfringens* was found in 4 samples while two had *C. tetani* isolated. *E. faecium* was detected in all samples, none of which were vancomycin-resistant. Four samples had *Cronobacter sakazakii* isolated and 2, *Bacillus cereus*. Four *Enterobacter* spp. were resistant to cefoxitin and had inducible AmpC  $\beta$ -lactamases, indicated by blunting of the adjacent cefpodoxime zone.

**Conclusions:**

The claims of health benefits for Chlorella and related products are unsubstantiated. There are limited reports about contamination of such products and very little information on antimicrobial resistant *Enterobacteriaceae*. Global distribution of ready-to-eat food products contaminated with non-pathogenic *Enterobacteriaceae* has the potential to contribute to introduction and dissemination of novel antimicrobial resistance mechanisms in the general population and may pose a specific risk to vulnerable ill people if they are taking such products in the belief that they confer health benefits.