

# COMPARISON OF ANTIMICROBIAL INTERVENTIONS SPRAYED ONTO BEEF RIB CAP SECTION INOCULATED WITH *E. COLI* O157:H7

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**Abstract** – The aim of this study was to demonstrate comparative antimicrobial effectiveness of various antimicrobial intervention solutions when sprayed onto *E. coli* O157:H7 -inoculated rib cap sections. The following antimicrobial interventions were used to spray for the study: Beefxide and Purac®CL21/80 (2.5% each) at 43-55°C, Purac® FCC88 (4.54%) at 43-55°C, Aftec 3000 (no dilution) at room temperature and Peroxy acetic acid (PAA) at 200 ppm concentration at room temperature. Water treatment at room temperature was used as control treatment. The most effective antimicrobial to reduce *E. coli* O157:H7 count on beef rib caps was Purac® FCC88 at 4.54%. There was a 1.13 log reduction in *E. coli* O157:H7 immediately after spraying Purac® FCC88 compared to the water spray treatment.

**Key Words** – *E.coli* O157:H7, Lactic acid, post-harvest interventions.

## I. INTRODUCTION

During beef processing, post-harvest interventions are frequently used to reduce the microbial and pathogen load. The post-harvest intervention include washes with (hot) water and antimicrobial solutions that are sprayed onto the meat. Of all pathogens, the most significant is enterohemorrhagic *E. coli* O157:H7. The aim of this study was to demonstrate comparative antimicrobial effectiveness of various antimicrobial intervention solutions when sprayed onto *E. coli* O157:H7 -inoculated rib cap sections.

## II. MATERIALS AND METHODS

A cocktail of four *E. coli* O157:H7 strains was used. Fresh beef rib caps were held at 4°C until use. The beef rib caps were inoculated in triplicate sets on the 'hide side' at  $1 \times 10^6$  CFU/cm<sup>2</sup>, and were held for attachment for 25-30 min at 10°C before spray treatments. The spraying was done

using a Ross TC700MC blade tenderizer with built-in spray system (the tenderizing capability was not used).

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## III. RESULTS AND DISCUSSION

The most effective antimicrobial to reduce *E. coli* O157:H7 count on beef rib caps was Purac® FCC88 at 4.54%. There was a 1.13 log reduction in *E. coli* O157:H7 immediately after spraying Purac® FCC88 compared to the water spray treatment. The spray treatments of beef rib caps with BeefXide, Purac® CL21/80, Aftec 3000 and PAA resulted in 0.58, 0.59, 0.59 and 0.35 log reductions in *E. coli* O157:H7 counts compared to water treatment, respectively.

## IV. CONCLUSION

The research substantiates the performance of lactic acid treatment to provide a food safety solution for beef carcasses.