



## The Efficacy of Lactic Acid Immersion as an Antimicrobial Intervention in Beef Sub-Primal Fabrication

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### Objectives

To perform an in-plant validation of a lactic acid immersion (2–5%) intervention in 6 different subprimals on the fabrication floor.

### Materials and Methods

Swab samples ( $n = 324$ ) were taken before and after intervention application from six different processing lines. Each subprimal had a 500 cm<sup>2</sup> area swabbed using sterile materials. Each repetition included 18 samples per line, 9 before and 9 after intervention, for a total of 108 samples per repetition. Swab samples were immediately chilled and shipped overnight to the TTU Food Microbiology laboratory for microbial analysis. Samples were stomached at 230 rpm for 30 s and for each subprimal, 3 individual samples were composited into one. Serial dilutions were performed and 1 ml of each composite was plated onto *Enterobacteriaceae*, aerobic plate count, *Escherichia coli* and coliform Petrifilms in duplicate. Counts were transformed into LogCFU/cm<sup>2</sup> and statistical analysis was performed to determine differences between before and after treatment samples with a 0.05 probability threshold.

### Results

Microbial counts of all four microorganisms evaluated were significantly reduced ( $P < 0.05$ ) after the lactic acid immersion (2–5%) intervention application in subprimals. Total coliform counts before and after treatment were 0.31 and 0.06 LogCFU/cm<sup>2</sup>, respectively. *Enterobacteriaceae* counts in the subprimals were in average 0.40 LogCFU/cm<sup>2</sup> before interventions and 0.06 LogCFU/cm<sup>2</sup> after intervention application. Overall aerobic plate counts were 1.77 LogCFU/cm<sup>2</sup> before intervention and 1.14 LogCFU/cm<sup>2</sup> after intervention. Generic *E. coli* counts after intervention were lower than the detection limit ( $< 1$  CFU/20 cm<sup>2</sup>).

### Conclusion

Based on data collected, it is reasonable to conclude that the lactic acid immersion intervention is effective in reducing common microbial indicators on subprimals inside the fabrication floor, improving the safety of the product.