



In-Plant Validation Study to Determine the Efficacy of Lactic Acid as an Antimicrobial Intervention on Beef Trimmings

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Keywords: beef, indicator organisms, lactic acid, trims
Meat and Muscle Biology 1(2):133

doi:10.221751/rmc2016.129

Objectives

To determine the in-plant efficacy of lactic acid (2 to 5%) as an antimicrobial intervention on beef trimmings.

Materials and Methods

We collected swabs during early, mid, and end shifts at a large beef processing facility in Nebraska. Swabs were collected from 3 different trims – shank, chuck, and heel separately. A total of 5 swabs were collected for each trim type before and 5 swabs after the application of a 2 to 5% lactic acid spray, for a total of 90 swabs per production day for 5 d ($n = 450$). Collected swabs were stomached, serially diluted, and plated onto generic *Escherichia coli* (*E. coli*)/Coliforms and Aerobic Plate Count (APC) petrifilms. Petrifilms were incubated for 24 to 48 h at 37°C. Coliform colonies were counted after 24 h whereas generic *E. coli* and APC colonies were counted after 48 h of incubation. For statistical analysis, a one-way ANOVA (SAS v. 9.3) was used to analyze the data.

Results

On beef shank swabs, treatment using 2 to 5% lactic acid spray significantly ($P < 0.05$) reduced coliforms and total aerobes (APC). However, generic *E. coli* were not significantly ($P > 0.05$) reduced because of the low initial counts. Similarly for beef chuck, the treatment showed significant reduction ($P < 0.05$) for generic *E. coli*, coliforms, and APC. For beef heel, only the APC had significant ($P < 0.05$) reductions. In each and every instance where there were no reductions, the initial numbers were too low to detect the reduction.

Conclusion

The lactic acid intervention program was effective in reducing microbial counts on all trim types where there were high initial counts. However, for low initial counts, the reduction was not significant.