

EFFECTS OF HOT WATER AND LACTIC ACID DECONTAMINATION ON BACTERIAL LOADS ON BROILER CARCASSES

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I. INTRODUCTION

Broiler meats as a source of human disease are associated with *Campylobacter* and *Salmonella* infections [1]. Both pathogens can be shed by healthy birds and are difficult to detect on-farm and by visual meat inspection in abattoirs [2]. Decontamination of poultry carcasses is often used in abattoirs in USA and Canada, but not commonly used in European abattoirs. Decontamination has been a subject of increasing interest in Europe, because of the potential for reducing surface contamination of carcasses and meat cuts, and thereby improving public health, more sustainable production with enhancing shelf-life of meat products. The aim of the study was to investigate the effect of hot-water immersion and 5% lactic acid immersion on the bacterial loads on broiler carcasses. In addition, the effect of on-line cold water-spray carousel was also investigated.

II. MATERIALS AND METHODS

In total, 110 carcasses were included in the study in a commercial abattoir. After evisceration and before cold water spray carousel, the carcasses were collected and brought to a separate room for immersion testing and microbiological sampling by whole-carcass rinse in 200 ml peptone water. Hot water treatment was tested at 70, 80, or 90 °C for 3 or 6 s. Immersion in 5% lactic acid immersion (15 °C) for 3 s and on-line cold water spray carousel was also tested. The next day, the samples were analysed for total plate count (TPC) and *E. coli* by Tempo AC and Tempo EC (BioMerieux). Statistical analyses were conducted in Stata/MP 17.0 using ANOVA.

III. RESULTS AND DISCUSSION

For untreated carcasses, TPC mean was 4.9 log cfu/ml and *E. coli* mean was 4.0 log cfu/ml. Mean TPC were significantly lower for carcasses immersed in hot water at 80 °C for 3 s and for 6 s and 90 °C for 3 s by 1.0-1.1 log cfu/ml. Immersion in 80 °C for 6 s significantly reduced the *E. coli* mean by 1.1 log cfu/ml. The results were according to other hot-water studies with temperature/time combinations lying mainly within 60-90 °C for 10-60 s [3, 4].

The most effective treatment was 5 % lactic acid solution. Immersion in lactic acid at 15 °C for 3 s significantly reduced TPC by 4.0 log cfu/ml and *E. coli* by 3.9 log cfu/ml. Currently, lactic acid immersion is not permitted to use on broiler carcasses in Europe, only on cattle carcasses.

Immersion in 70 °C for 3 s and the on-line cold-water carousel (3 s) resulted in an insignificant reduction in TPC and *E. coli* levels. Hot water immersion and lactic acid immersion did not cause skin damage, but for lactic acid treatment, a thin white layer was visible on the skin surface after drying.

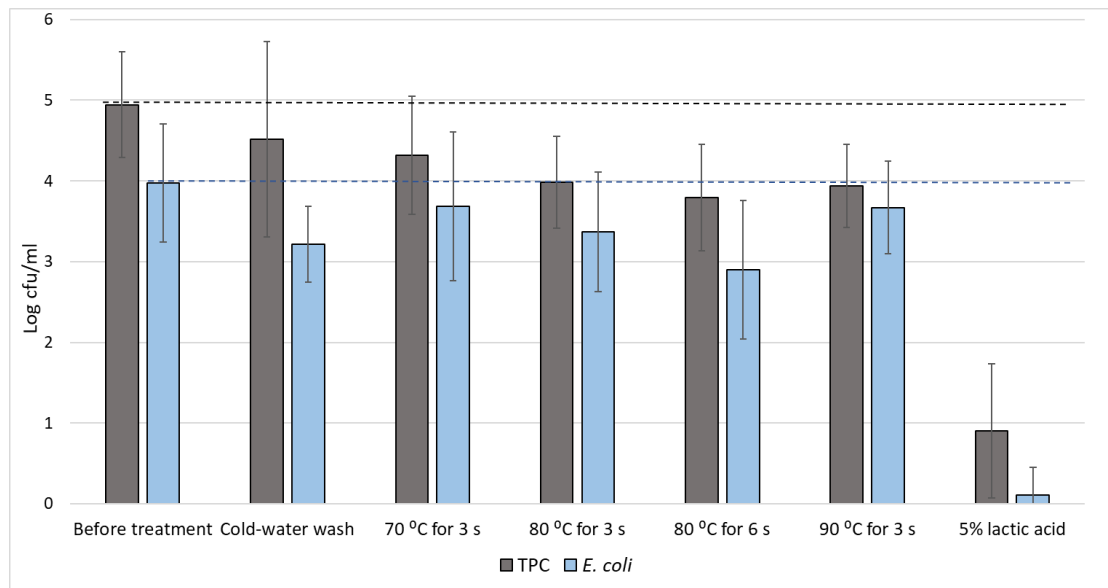


Figure 1 Results for TPC log cfu/ml and *E. coli* log cfu/ml for the controls before treatment (bars to the left) and six intervention treatments. Error bars indicate 95% confidence intervals.

IV. CONCLUSION

Immersion for 6 s in 80 °C was the most effective hot-water treatment for broiler carcasses compared to immersion for 3 s in 70, 80, and 90 °C.

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