Introduction

- Poultry products are subjected to USDA-Food Safety and Inspection Service (FSIS) inspection before commercialization. In-line inspection requires a speed of 35 birds per minute to assure proper observation and when necessary removal of carcasses from the line for further inspection and product disposition.
- Since 1999, FSIS evaluated the performance of a modernized inspection system, known as HIMP (HACCP-Based Inspection Models Project), and recently authorized facilities to consider the implementation of new inspection systems and line speeds up to 170 bpm.
- The New Poultry Inspection System (NPIS) requires a methodology to demonstrate microbial control when compared with the traditional inspection system; and if new line speeds are considered, they also need to be compared with a conventional microbial baseline.

Objectives

- Conduct a biomapping study of indicator bacteria to validate a new standardized protocol to establish microbial baselines to support processing modifications based on the New Poultry Inspection System (NPIS).
- Determine microbial levels of Aerobic plate counts, Enterobacteriaceae, Coliforms and Escherichia coli during the chicken slaughtering process and develop statistical process control parameters.

Materials and Methods

- Sample of whole chicken carcasses
- Fill bag with 490 mL BPW
- Rotary movement to rinse carcasses
- Petrifilm™ inoculation
- Serial dilutions
- Identified samples

Materials:
- Buffered Peptone Water (BPW)
- Petrifilm™ Violet Red Bile for generic Escherichia coli and Coliforms, Petrifilm™ Violet Red Bile Glucose (VRBG) for Enterobacteriaceae and Petrifilm™ with standard nutrients for Aerobic plate counts.

Methods:
- To take samples (carcasses rinses) from 11 sampling stations during a week of processing N= 10 samples per station per 5 days.
- Serial dilution from 10⁻¹ to 10⁻⁴ using 1 mL of chicken rinse in 9 mL of BPW and plating in Petrifilm™.

RESULTS

- Enterobacteriaceae
- Aerobic plate count

CONCLUSIONS

- A detailed biomap on the microbial indicator loads at 11 different stations during chicken processing was developed for a commercial processing facility.
- The reduction for APC showed the most representative microbial load of 6.8 Log, that represents a reduction of 99.999% of the total initial population.
- Enterobacteriaceae, Coliforms and Escherichia coli showed a reduction of 5.7 Log (99.999%) of the total initial population.
- The utilization of Peracetic acid as an antimicrobial intervention was principally responsible for the reduction in the sampling site C-D and H-I, for this reason, it is possible to have less than 1 LogCFU/mL in the final processing stations.
- This methodology is effective for processors to demonstrate process control when changes are implemented.

REFERENCES


ACKNOWLEDGEMENTS

Thanks to the International Center for Food Industry Excellence (ICIEF) for their support in this study.