

Bio-Mapping of Pathogens and Indicator Organisms throughout the Poultry Processing Chain Using Hygiena's MicroSnap™ and BAX® System SalQuant™, and bioMérieux Tempo® Methods



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Introduction

Physical and chemical interventions are heavily used in the poultry industry to reduce *Salmonella* and *Campylobacter* presence on final poultry products driven by the USDA-FSIS performance standards. When only prevalence testing is performed, intervention efficacy is difficult to evaluate, creating the need for quantification-based baseline evaluations.

Purpose

The purpose of this study was to develop an indicator organism and pathogen baseline, with and without chemical interventions, by bio-mapping the processing chain from flock-to-final product of a large USDA-inspected poultry processor.

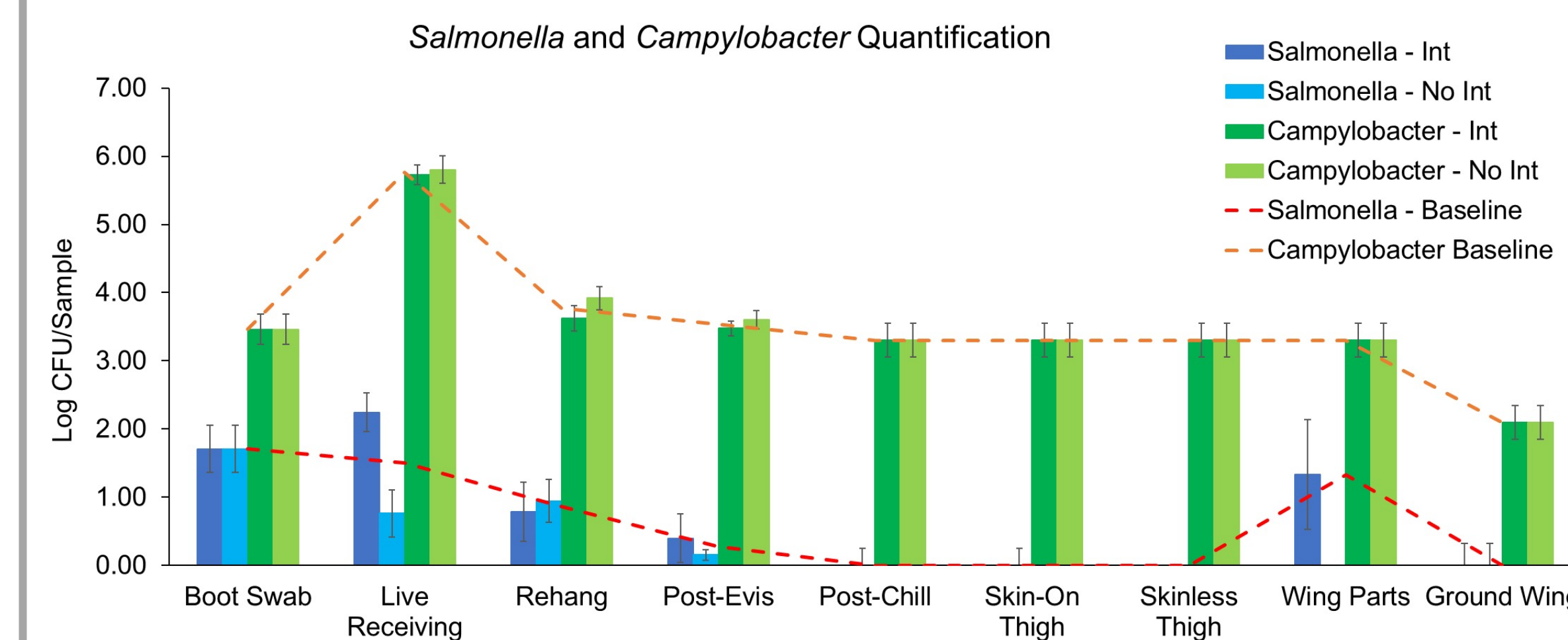
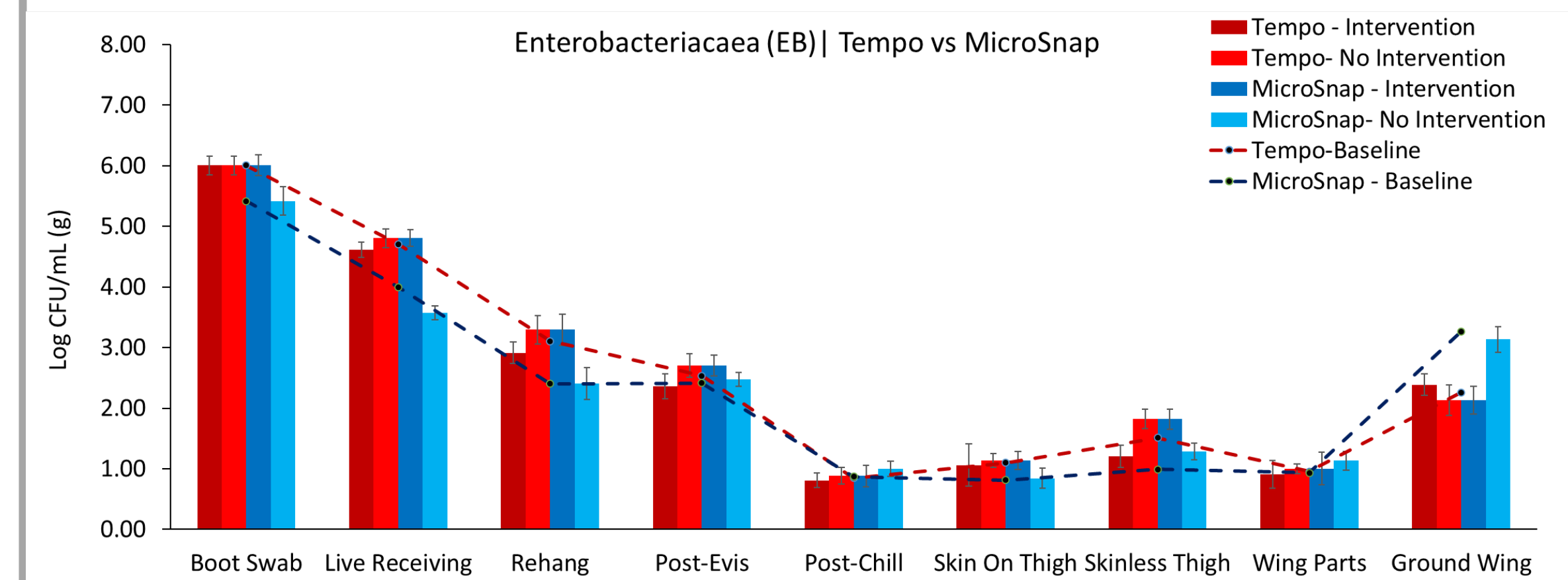
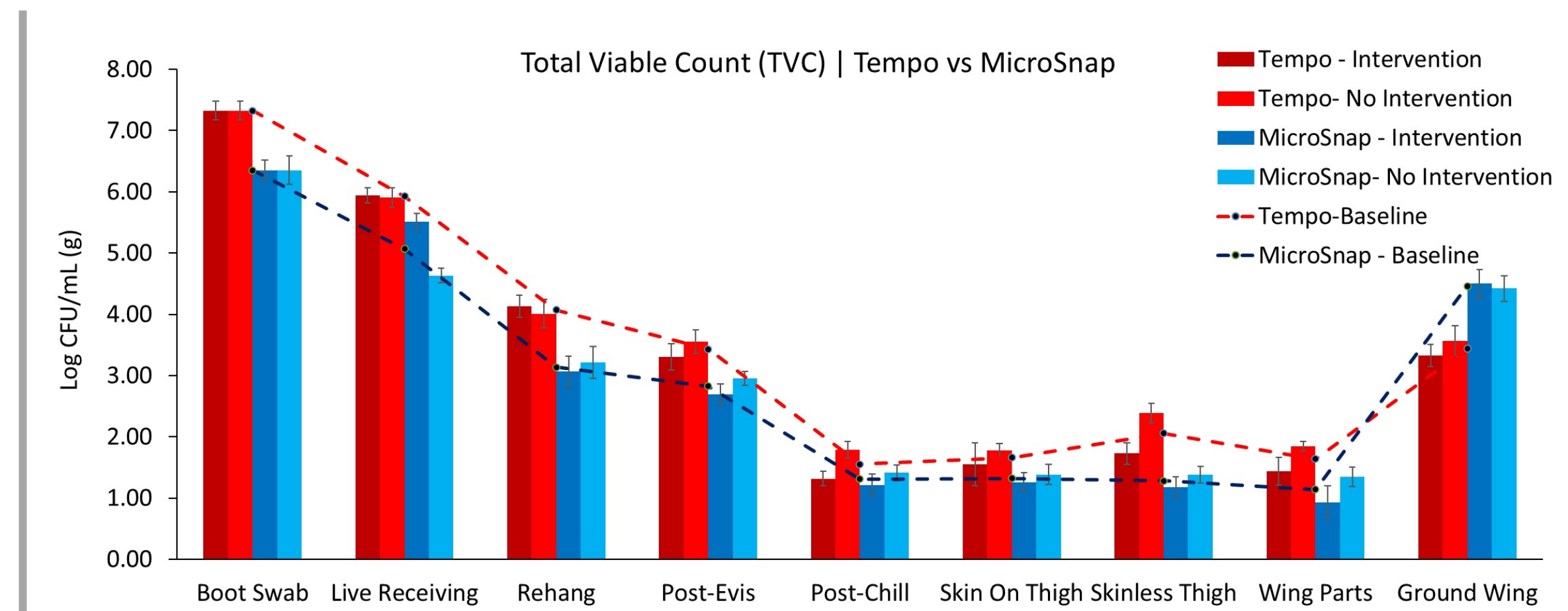


Methods

Five poultry samples were collected at each poultry sampling location (9), with and without interventions, across 5 days (n=450; Boot swabs, Live-receiving, Rehang, Post-evisceration, Post-chill, Skin-On-Thighs, Skinless-Thigh, Wing-Parts, Ground-Wings). All samples were prepared utilizing a single enrichment source for indicator organisms (Total-Viable-Count and *Enterobacteriaceae*) tested with Hygiena™ MicroSnap™ and TEMPO®, *Salmonella* prevalence and enumeration tested with BAX® System Real-Time *Salmonella* and SalQuant™ (respectively), and bioMérieux TEMPO® for *Campylobacter* enumeration. All bacterial counts were converted to Log₁₀CFU/carcass with comparisons using an ANOVA in JMP® (Version 14.3.0. SAS Institute Inc., Cary, NC, 1989-2019) with significance at $P \leq 0.05$.

Results

There was no intervention effect on the sample population ($P = 0.167$) indicating that physical interventions were just as effective at reducing indicator organisms and pathogens compared to chemical interventions. Only indicator organism counts decreased from live-production boot swabs samples to initial live-receiving samples; however, *Campylobacter* and *Salmonella* counts increased by 2.30 and 0.5 Log₁₀CFU/carcass, respectively. Post-live receiving, both pathogens and indicator organism counts continued to decrease, regardless of intervention, until further processing where ground wing samples rebounded for prevalence and quantification.



Significance

This study provides evidence that physical interventions are just as effective at reducing indicator organisms and pathogen counts to safe levels. These conclusions can further promote reducing chemical usage while still producing a safe and wholesome product.

