

Salmonella Quantification (SalQuant™) with Hygiena's BAX® System for Turkey Feet Swabs and Cloacal Swabs



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Introduction:

Salmonella control programs are important for both on the farm and in the plant for poultry processors to control and reduce levels of contamination. Since Salmonella is excreted in the feces of infected birds; drag swabs, boot swabs and cloacal swabs are some of the sample types collected to determine the extent of colonization. In addition to knowing if samples are positive, the load of Salmonella would be useful to determine the amount going into the processing facility from the farm.

Purpose:

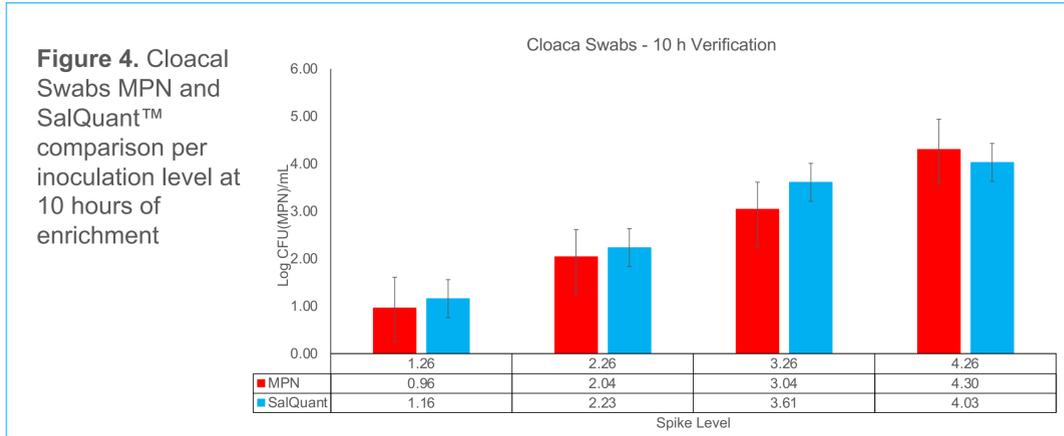
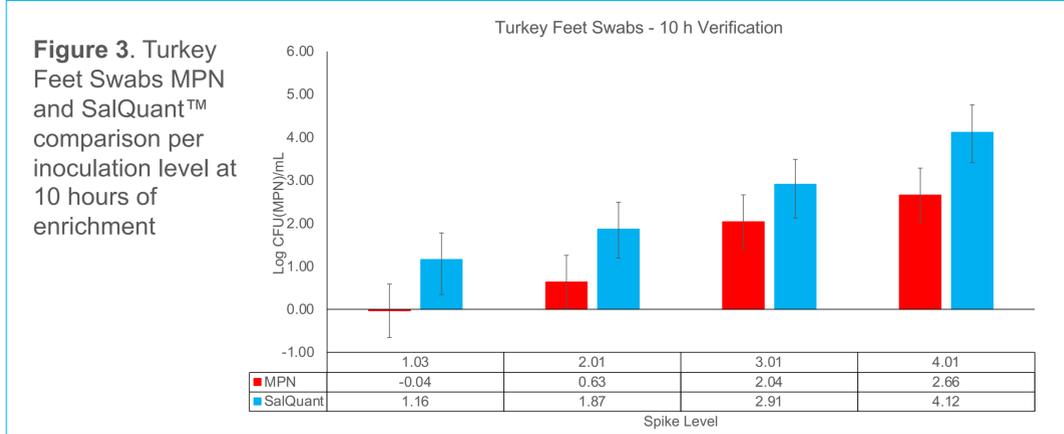
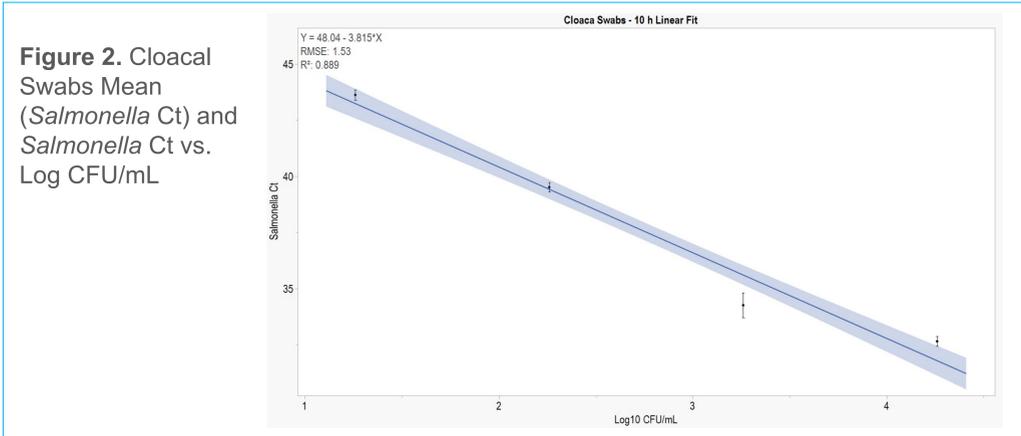
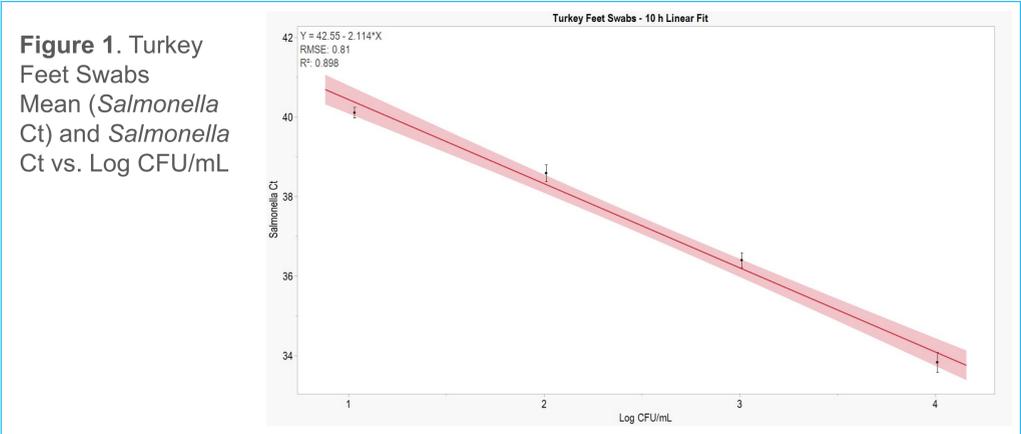
Since Salmonellosis is concentration-dependent, rapid methods for quantification are desired to identify a high load of Salmonella and prevent more foodborne illnesses. The purpose of this study was to develop and verify a Real-Time PCR assay for Salmonella quantification (SalQuant™) in turkey feet swabs and cloacal swabs.

Method:

Turkey feet swabs and cloacal swabs (composites of 10) provided by an industry partner were pre-screened by adding 100 mL of BPW. A 10 mL aliquot was incubated for 18-24 hours, while the remaining 90 mL was stored at 4°C. Samples that were negative were pooled together to create a bulk negative slurry. Thirty milliliter aliquots from the bulk slurry of each matrix was inoculated with Salmonella Typhimurium ATCC 14028 across five levels (1, 10, 100, 1,000, and 10,000 CFU/mL). Samples were combined with 30 mL of pre-warmed MP media with Quant Solution, incubated at 42°C for 8-12 hours and tested by Real-Time PCR in quintuplet. The best linear fit equation was determined with R-squared and Log RMSE using JMP 15.

Results:

The 10-hour enrichment produced the best linear fit equation for both matrices. The turkey feet swab curve has a R-squared of 0.90 and Log RMSE of 0.38 (Figure 1). The cloacal swabs curve has a R-squared of 0.89 and Log RMSE of 0.40 (Figure 2). When compared to MPN, PCR results displayed higher accuracy and closeness to the actual Log CFU/mL input (Figures 3 and 4).



Significance:

These studies demonstrate accurate and rapid quantification of Salmonella from turkey feet swabs and cloacal swabs using the BAX® System. Processors that adopt these protocols can use SalQuant™ as a tool to measure and improve the efficacy of various antimicrobial interventions on the farm and in the plant, leading to better identification and management of products posing a high public health risk.