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Simultaneous Detection and Differentiation of Campylobacter from Poultry in less than 24 Hours

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INTRODUCTION

Campylobacter jejuni, C. coli and C. lari from contaminated poultry are causative agents of invasive infections resulting in 1.3 million cases in the United States annually. It is challenging to differentiate these species due to their similar 16s rRNA sequences and phenotypic traits.

This study evaluated performance of the Thermo Scientific™ SureTect™ Campylobacter jejuni, C. coli and C. lari PCR assay in detecting and differentiating three *Campylobacter* targets in poultry samples vs Hygiena™ BAX™ System Real-Time PCR Assay for Campylobacter.

MATERIALS AND METHODS

Pure Isolate Study

Fifty-eight *Campylobacter* isolates and 58 closely-related isolates used to test inclusivity (Figure 1) and exclusivity (Figure 2) respectively.

Matrix Study

Twenty-eight poultry samples including carcass rinse, raw meat with skin and ready to re-heat meat were spiked with *Campylobacter* isolates and tested via PCR using the SureTect (Figure 3) and BAX (Figure 4) methods.

Figure 1. Inclusivity

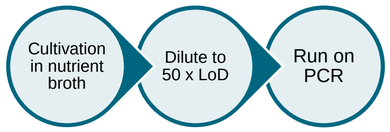


Figure 2. Exclusivity

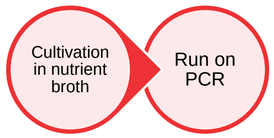


Figure 3. SureTect Workflow

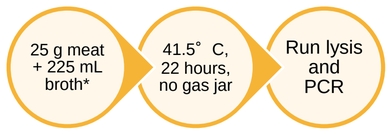
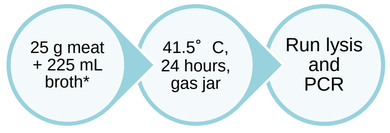


Figure 4. BAX Workflow



^LoD: Limit of Detection, 10^4 CFU/mL
*prewarmed Bolton Broth with selective supplement, without blood

RESULTS

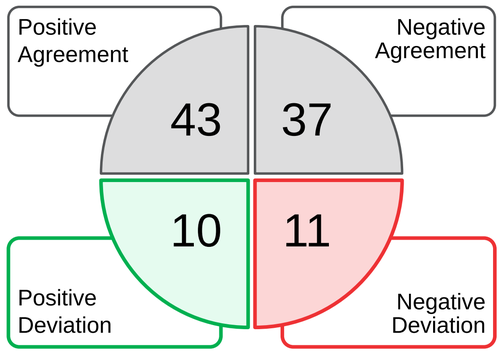
Figure 5. Inclusivity Results (SureTect vs. BAX)

	C. jejuni	*C. coli*	*C. lari*
SureTect	**100%**	**100%**	**100%**
BAX	**100%**	**85%**	**46%**

The SureTect PCR assay demonstrated superior inclusivity compared to the BAX PCR assay for *C. coli* and *C. lari* (Figure 5).

Exclusivity of both assays was 100%.

Figure 6. Method Agreement for *Campylobacter* species



Unpaired Study Key:
Positive Agreement = SureTect Positive, BAX Positive
Negative Agreement = SureTect Negative, BAX Negative
Positive Deviation = SureTect Positive, BAX Negative
Negative Deviation = SureTect Negative, BAX Positive

Table 1. Rate of PCR Positive Detection per Target

Method	*C. jejuni*	*C. coli*	*C. lari*
SureTect	47	30	5
BAX	45	9	3

The method comparison demonstrated that the 22 hour SureTect workflow and 24 hours BAX workflow were comparable when detecting *Campylobacter* species (Figure 6). Co-infection scenarios were frequently missed with the BAX assay compared to SureTect (Table 1); *C. coli* was detected in 21 fewer samples.

CONCLUSIONS

The SureTect PCR Assay demonstrated superior inclusivity performance to the BAX PCR assay.

The SureTect workflow enables users to reliably detect and differentiate *Campylobacter* from poultry samples, without using gas jars, within 24 hours.

TRADEMARKS/LICENSING

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