

Accuracy of Molecular Screening Methods for the Detection of *Salmonella enterica* in Production Ground Poultry Samples

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Introduction: Accurate detection methods are essential in the poultry industry to detect *Salmonella enterica* in ground poultry products as a means to monitor baselines and verify process controls. Accuracy may be impacted by factors including sample preparation and detection method utilized.

Purpose: The purpose of these studies was to comparatively evaluate the accuracy of the Atlas[®] Salmonella SEN Detection Assay and BAX[®] Salmonella Assays (original and real-time) for the detection of *Salmonella enterica* in production ground poultry products.

Methods: Ground poultry products, consisting of ground turkey (n=39) and ground chicken (n=4), were collected by two poultry processors. Sample weights ranging from 25 to 325 g were enriched utilizing Buffered Peptone Water (BPW) in a 1:10 dilution at 35 ± 2°C. For the Atlas Salmonella SEN Detection Assay method, 400 µL was transferred into sterile Roka Sample Transfer Tubes at 12 h (Processor B) and at 18 to 24 h (Processor A). Both processors conducted BAX analysis as per routine procedure on the paired enrichments at 20 to 24 h. Duplicate 1.5- to 2.0-mL aliquots from the enrichments were sampled into sterile vials, maintained at 4°C, and shipped to Roka Bioscience for cultural analysis. Atlas Salmonella SEN Detection Assay and culture results were reported to collaborators at which time BAX results were disclosed.

Results: In total, *Salmonella enterica* was identified in 27.91% of samples by culture analysis, in 25.58% by the Atlas Salmonella SEN Detection Assay, and in 16.28% by the BAX Assay. The BAX Assay reported five false-negative results and the Atlas Salmonella SEN Detection Assay reported one false-negative result as compared to culture on ground poultry samples. Percent agreement of the screening tests to culture for the Atlas Salmonella SEN Detection Assay and BAX Salmonella Assays were 97.67% and 88.37%, respectively.

Significance: Screening method performance and accuracy can be adversely affected by matrix characteristics, variation in sample preparation procedures, and the rapid detection method utilized.

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