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Research Note

Pooling of Laying Hen Environmental Swabs and Efficacy of *Salmonella* Detection

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Objective

Determine efficacy of detecting *Salmonella* Enteritidis, Heidelberg, Typhimurium, and Kentucky in single and pooled swabs

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Materials and methods

- Drag swabs (cage-free high-rise) and manure scraper blade swabs (conventional cage) collected
 - Same flocks entire study
 - Pullet, post-peak, and post-molt
 - In accordance with FDA Egg Rule requirements
- Transported to laboratory on ice
- Refrigerated overnight



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Inocula

- *Salmonella* Enteritidis (1000 ppm streptomycin resistant)
- *Salmonella* Heidelberg (200 ppm nalidixic acid resistant)
- *Salmonella* Typhimurium (200 ppm nalidixic acid resistant)
- *Salmonella* Enteritidis (1000 ppm streptomycin resistant) +
Salmonella Kentucky (200 ppm nalidixic acid resistant)

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Materials and methods

- Single swab inoculation
- Inoculation levels
 - Low = ~10 cfu
 - High = ~100 cfu
- Pools (one swab/pool contained inoculum)
 - 1 swab
 - 2 swabs
 - 4 swabs



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Materials and methods

- Non-selective enrichment (BPW)
- Selective enrichment
 - Tetrathionate (TT)
 - Rappaport-Vassiliadis (RV)
- Selective plating on Brilliant Green Sulfur + 200 ppm nalidixic acid or 1000 ppm streptomycin
- For each selective enrichment method, n = 24 pools each dose and swab/pool combination per inoculum
- Chi-square analysis

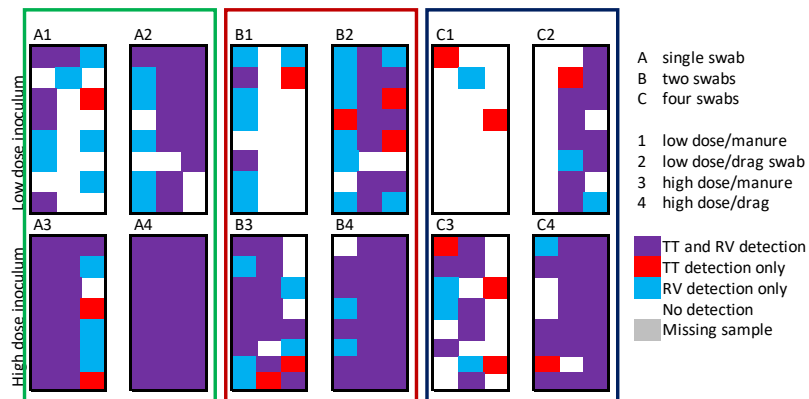
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Results



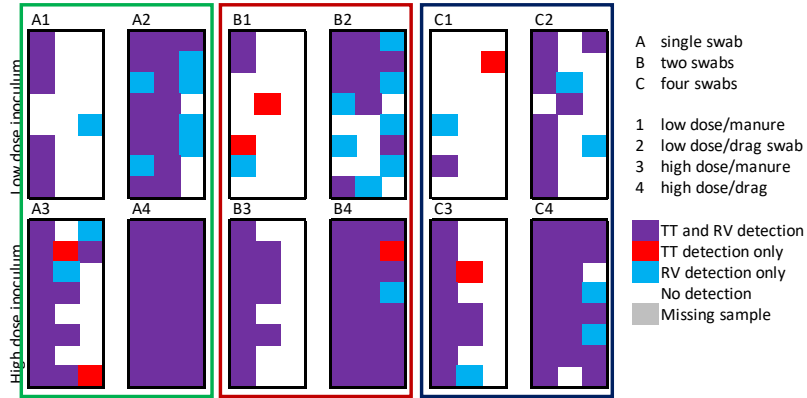
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Salmonella Enteritidis



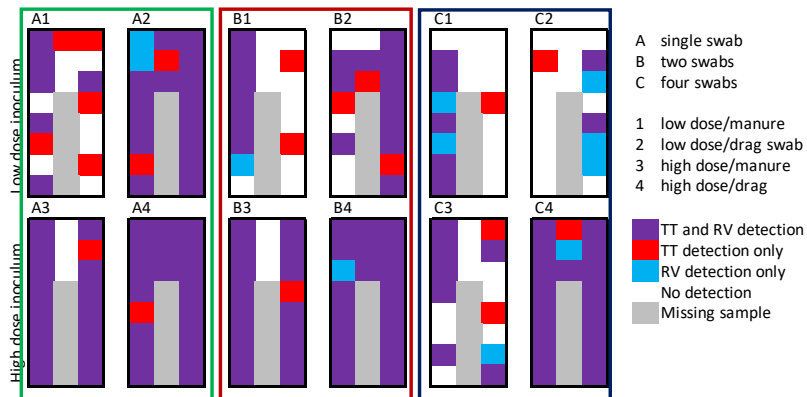
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Salmonella Heidelberg

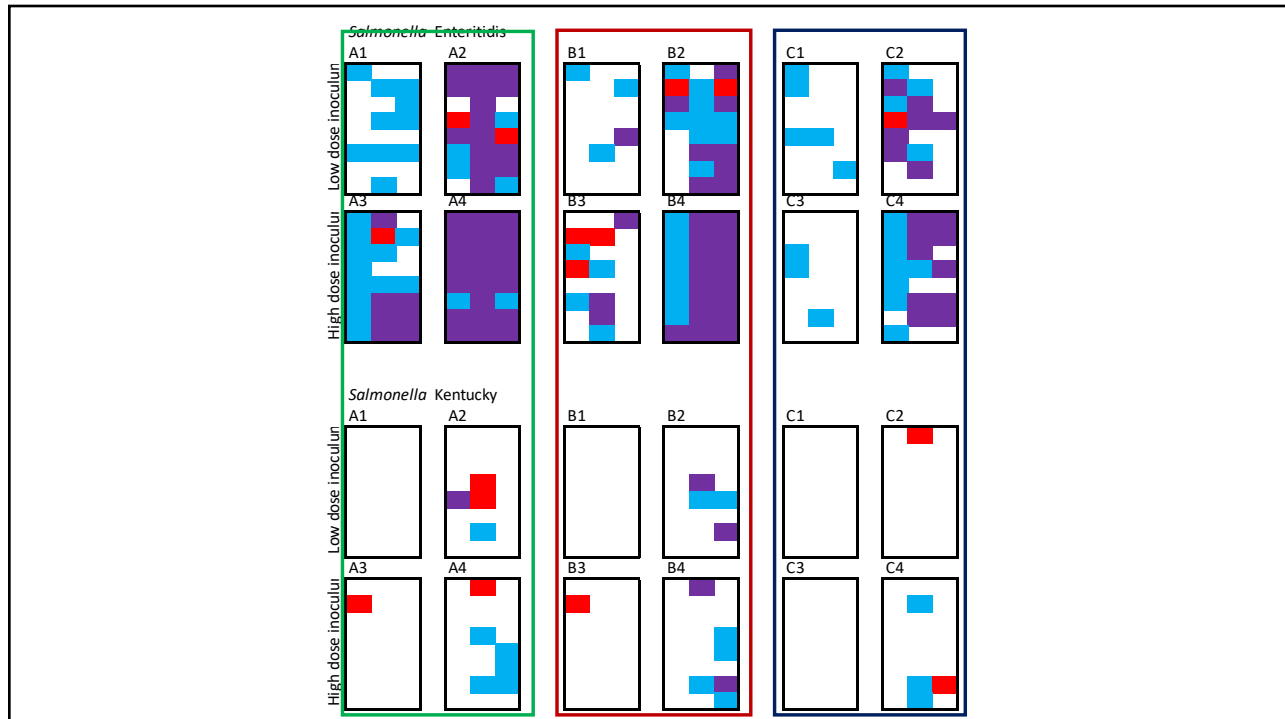


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Salmonella Typhimurium



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Outcomes

- Single swabs always had best rate of recovery
- Better recovery of low dose inoculums in drag swabs vs manure scraper blade swabs
- Pooling swabs generally resulted in depressed rate of recovery
 - More pronounced in manure scraper blade swabs
- Dual selective enrichment resulted in greatest possible detection

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