Quantification of *Salmonella* in Turkey Wing Rinsates using BAX® System Sal Quant Compared to MPN

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Introduction:

- The USDA requires mandatory testing for *Salmonella* in the poultry industry to ensure proper reduction in their lethality step.
- Common methods such as most probable number (MPN) or plating take roughly 12-24 hours before results can be read.
- Real-time PCR is a potential method that can be conducted rapidly compared to other conventional methods.
- Utilizing the BAX system for real-time polymerase chain reaction (PCR), *Salmonella* concentrations can be more accurately described than using MPN.

Purpose:

- To test whether the BAX System is a more accurate method than a conventional method such as MPN.
- To determine the optimal time for pre-enrichment before running real-time PCR using the BAX System.
- To develop linear correlations using the BAX System for *Salmonella* concentrations.

Procedure:

1. Turkey rinsate samples were received from different parts of the production facility (E1, E2, E3, and E4).
2. Samples were tested for naturally occurring *Salmonella* and inoculated with *Salmonella* typhimirium (10^0, 10^1, 10^2, 10^3, 10^4, and 10^5 CFU/mL).
3. Samples were then left in refrigeration for 48 hours.
4. Samples were then added to the pre-enrichment media (42°C BAX MP + 40 mg/L Novobiocin) and allowed to incubate for 6, 8, 10 and 24 hours before real-time PCR was run.
5. The cycle threshold (CT) values were collected for any positives and plotted to develop linear correlations.

Results:

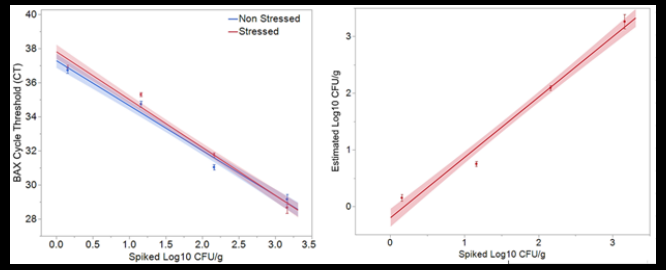

Fig 1. Developed Correlation of BAX machine output and *Salmonella* concentration

Conclusion & Discussion:

The results of this experiment shows that using the BAX System to run real-time PCR is a more accurate method than a conventional method such as MPN. This means that this method can be used by the poultry industry and be complete in a reasonable amount of time.

From the data, a pre-enrichment time of 6 hours was found to be the optimal time before running the BAX System. This means that the whole PCR process should take only 6-8 hours. When comparing this to conventional methods, real-time PCR takes considerably less time. The difference between a couple of hours is crucial in the industry because of factors such as shift changes and product shipment. A couple of hours is crucial when trying to order a recall or isolate contaminated product.

Overall, the poultry industry needs a rapid method of detection of *Salmonella* to help with recalls. The data acquired in this experiment supports the use of real-time PCR instead of conventional methods. This method will help the industry control and monitor outbreaks more efficiently.

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