

AOAC-RI PTM Matrix Extension of the Thermo Scientific RapidFinder Salmonella species, Typhimurium and Enteritidis Multiplex PCR Kit

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OBJECTIVE

To extend the matrix range validated for the Thermo Scientific™ RapidFinder™ Salmonella species, Typhimurium and Enteritidis Multiplex PCR Kit (candidate method) through the AOAC Research Institute *Performance Tested Methods*SM (PTM) program.

MATERIALS AND METHODS

The candidate method was validated in comparison to the U.S. Food and Drug Administration (FDA) Bacteriological Analytical Manual (BAM) Chapter 5¹ for shell eggs and environmental matrices and the U.S. Department of Agriculture (USDA) Food Safety and Inspection Service (FSIS) Microbiology Laboratory Guidebook (MLG) 4.09² for all other food matrices. The validated matrices are detailed below;

Initial validation matrices

- Chicken thighs and chicken wings with skin
- Chicken nuggets
- Raw pork sausage
- Stainless steel surface

Matrix extension matrices

- Shell eggs
- Chicken carcass rinse
- Ground turkey (375 g sample size)

The candidate method was tested in line with the user guide³ summarised in Figure 1. All samples, with the exception of ground turkey, were prepared using the Applied Biosystems™ SimpliAmp™ Thermal Cycler (shown in figure 2). The ground turkey samples were prepared using the Thermo Scientific™ KingFisher™ Flex Purification System.

All samples were analysed using the Applied Biosystems QuantStudio 5 Real-Time PCR instrument (shown in figure 3) (using Thermo Scientific™ RapidFinder™ Analysis software v1.0) and the Applied Biosystems™ 7500 Fast Real-Time PCR instrument (using Thermo Scientific™ RapidFinder™ Express software v2.0).

Figure 1. Protocol for the RapidFinder Salmonella species, Typhimurium, and Enteritidis PCR method

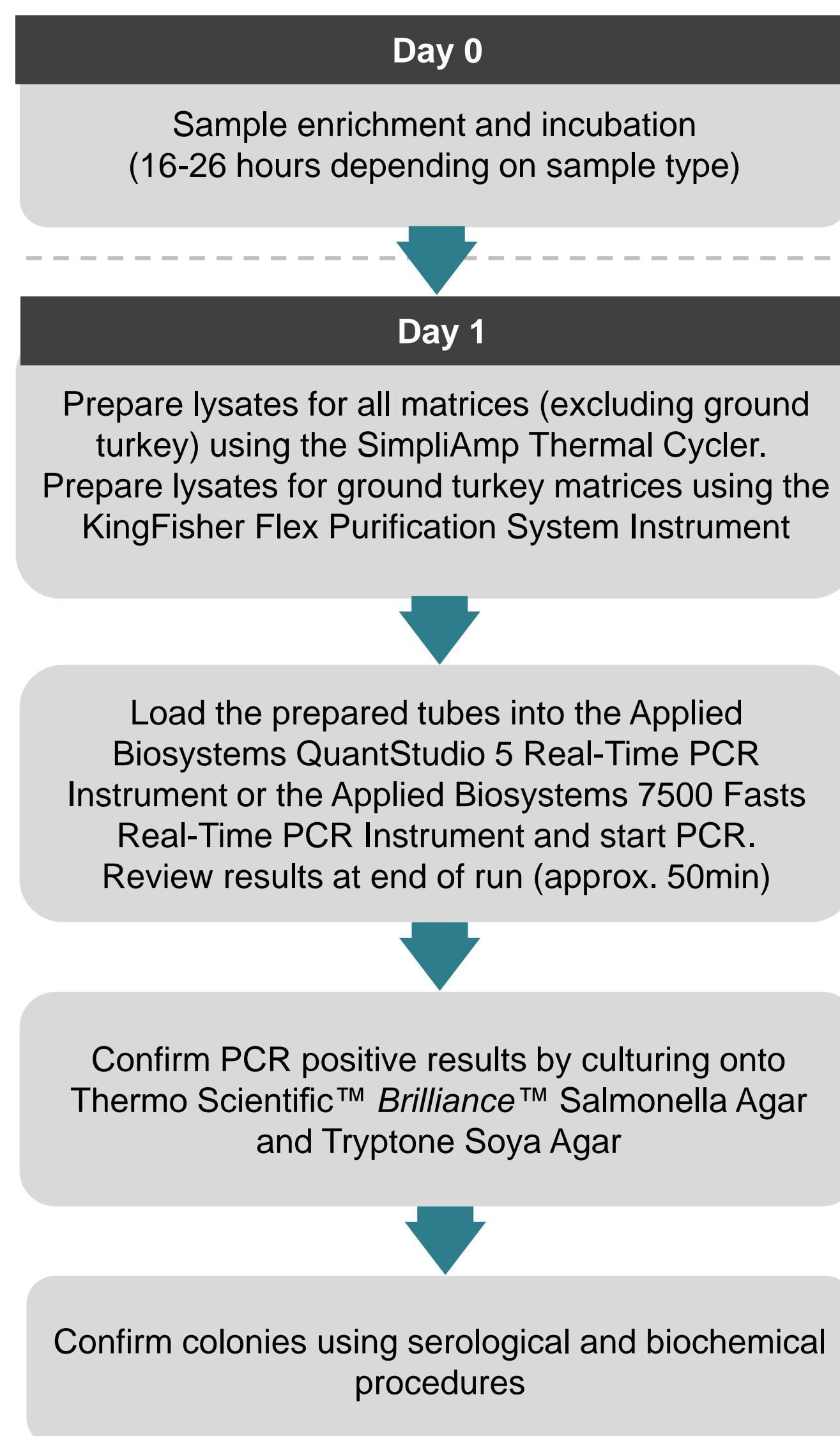


Figure 2. Applied Biosystems SimpliAmp Thermal Cycler Instrument



Figure 3. Applied Biosystems QuantStudio 5 Real-Time PCR Instrument



RESULTS

The data collected during the study was analyzed using probability of detection (POD) analysis to 95% confidence intervals.

Few statistically significant differences by POD statistical analysis were observed between the candidate and reference method for all additional matrices. The statistically significant differences that were observed were due to superior performance of the candidate method in comparison to the reference methods. During the shell egg testing the MLG 4.09 reference method showed poor recovery of *Salmonella* Enteritidis and *Salmonella* Heidelberg in comparison to the candidate method, which is likely due to competition for growth during dual inoculation.

Inclusivity testing demonstrated that the candidate method was able to detect all the major groups of *Salmonella enterica* subspecies *enterica*, the less common subspecies of *S. enterica* and the rarely encountered *S. bongori*. No exclusivity isolates were detected.

CONCLUSIONS

The evaluation of the RapidFinder Salmonella species, Typhimurium and Enteritidis Multiplex PCR Kit has shown that it is an effective and reliable method for the detection and differentiation of *Salmonella* species, *Salmonella* Typhimurium, and *Salmonella* Enteritidis from chicken thighs with skin, chicken wings with skin, chicken nuggets, pork sausage, ground turkey (375 g), shell eggs, chicken carcass rinse and stainless steel surface samples.

The RapidFinder Salmonella Multiplex Solution offers simple sample preparation and results in 16–26 hours (depending on sample type) streamlines testing workflow and reduces waiting time for product release or intervention.

The matrix extension study is certified under PTM081701 as of 8th May 2018 in accordance with the AOAC-RI PTM program.

REFERENCES

1. U.S. Food and Drug Administration Bacteriological Analytical Manual Chapter 5: *Salmonella*. (2016) Wallace
2. U.S. Department of Agriculture Food Safety and Inspection Service *Microbiology Laboratory Guidebook* 4.09 (2017). *Isolation and Identification of Salmonella from Meat, Poultry, Pasteurized Egg, and Siluriformes (Fish) Products and Carcass and Environmental Sponges* Revision .09.
3. Thermo Scientific RapidFinder Salmonella species, Typhimurium and Enteritidis Multiplex PCR Kit User Guide. Pub No. MAN0015918 Revision A.0.

TRADEMARKS/LICENSING

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