

Evaluation of Thermo Scientific SureTect Salmonella Species PCR Assay For Detection of *Salmonella* In Chocolate

Oleksiuk, M., Hopper, C., Scopes, E.

Thermo Fisher Scientific, Wade Road, Basingstoke, Hants, RG24 8PW, UK

Overview

Purpose: The aim of this study was to evaluate the performance of the Thermo Scientific™ SureTect™ Salmonella species PCR Assay (Thermo Fisher Scientific) for detection of *Salmonella* Tallahassee from dark chocolate (70% cocoa).

Methods: Samples of dark chocolate were combined with Thermo Scientific™ Oxoid™ Cocoa Sample Recovery (CSR) Broth (Thermo Fisher Scientific) in a 1:10 ratio and artificially contaminated with stressed *Salmonella* Tallahassee at three spike levels. Following incubation, enriched samples were tested using the SureTect Salmonella species PCR Assay. All positive and negative results were confirmed according to the manufacturer's instructions.

Results: The SureTect Salmonella species PCR Assay showed high sensitivity, specificity and accuracy for detection of *Salmonella* Tallahassee from dark chocolate (70% cocoa).

Introduction

Salmonella is one of the most frequent causes of food poisoning and a major public health problem worldwide. Foods often contaminated with *Salmonella* include meat, poultry, milk and dairy products, eggs, seafood, and some fruits and vegetables. The detection of *Salmonella* in foods before they are consumed is vital for safeguarding public health, and essential for preserving the financial health and reputation of food businesses¹.

The SureTect Salmonella species PCR Assay is a real-time PCR test which is optimised for use in conjunction with the Thermo Scientific™ PikoReal™ Real-Time PCR Instrument (see figure 1) and the Thermo Scientific™ SureTect™ Software for the detection of *Salmonella* spp. in food and environmental samples.

Methods

Spiking of chocolate samples

Salmonella Tallahassee was cultured in Tryptone Soya Broth (TSB) at 37°C for 18-24 hrs. then heat stressed in a water-bath set at 55°C for 10 mins. Ten 25 g samples were individually spiked with low (1-5 CFU/25 g) (n=5), high (10-20 CFU/25 g) (n=3) concentrations of *Salmonella* Tallahassee. Two samples remained unspiked.

FIGURE 1. PikoReal Real-Time PCR Instrument and SureTect PCR Assays



SureTect Salmonella species PCR Assay

The ten 25 g chocolate samples were combined with 225 ml of CSR Broth and incubated for 20 hrs. at 37±1°C. Ten µl of each enriched chocolate sample was added to the prefilled SureTect Lysis Tubes (prepared by additionally adding Proteinase K Reagent) and the sample lysed according to the SureTect lysis protocol (37°C for 10 mins followed by 95°C for 5 mins). Once lysed, 20 µl of the lysate was added to the SureTect PCR Tubes (contain lyophilised PCR reagents). Then the SureTect PCR Tubes were loaded into the SureTect PikoReal Real-Time PCR instrument and the PCR run was started. After approximately 1 hr and 20 mins, the SureTect Salmonella species PCR Assay results were automatically interpreted as 'positive' or 'negative' by the SureTect Software.

Confirmation of results

All results from the SureTect System were confirmed culturally using the SureTect confirmation method as stated in the IFU. Enriched samples were streaked onto Thermo Scientific™ Oxoid™ Brilliance™ Salmonella Agar and incubated at 36±1°C for 24 hrs. Presumptive positive purple colonies observed on Brilliance Salmonella Agar were confirmed using Thermo Scientific™ Oxoid™ Salmonella Latex Kit and Thermo Scientific™ Remel™ Salmonella O Polyvalent agglutinating sera.

Data analysis

The data obtained was used to calculate the sensitivity, specificity and accuracy for the SureTect Salmonella species PCR Assay.

Results

Sensitivity, specificity and accuracy of the SureTect Salmonella species PCR Assay are reported in table 1 below.

TABLE 1. Performance of SureTect Salmonella species PCR Assay

Performance measure	SureTect Salmonella species PCR Assay
Sensitivity (low spike)	100%
Sensitivity (high spike)	100%
Sensitivity (overall)	100%
Specificity	100%
Accuracy	100%

Conclusion

SureTect Salmonella species PCR Assay showed 100% sensitivity, specificity and accuracy in detecting *Salmonella* Tallahassee from dark chocolate (70% cocoa) at both low and high-level spike levels.

References

1. United States Food and Drug Administration. Bad Bug Book: Foodborne pathogenic microorganisms and natural toxins handbook: Salmonella. Available at:

<http://www.fda.gov/Food/FoodSafety/FoodborneIllness/FoodborneIllnessFoodbornePathogensNaturalToxins/BadBugBook/ucm069966.htm>

© 2014 Thermo Fisher Scientific Inc. All rights reserved. All trademarks are the property of Thermo Fisher Scientific and its subsidiaries. This information is not intended to encourage use of these products in any manner that might infringe the intellectual property rights of others.

LT2142A August 2014

Thermo
SCIENTIFIC

A Thermo Fisher Scientific Brand