Evaluation Of Real-Time PCR Salmonella Spp., S. Enteritidis And S. Typhimurium Assay Performance In Poultry Meat Samples

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ABSTRACT

Purpose
The purpose of the study was to verify the performance of the Thermo Scientific™ TaqMan® Salmonella Triplex Assay (species, Enteritidis and Typhimurium) with direct lysis as a rapid PCR method for the detection and differentiation of Salmonella spp., S. Typhimurium and S. Enteritidis with a range of different poultry samples at two major poultry meat manufacturers’ laboratories in Brazil.

Methods
At the first laboratory the TaqMan Salmonella Triplex Assay was compared against two other commercially available assays. However these 2 other assays do not detect S. Enteritidis and S. Typhimurium separately as they were Salmonella spp. specific only. At the second laboratory no alternative method was included in the study.

Results
The TaqMan Salmonella Triplex Assay method proved to be an accurate method. Ninety-eight percent and 100% of the samples yielded expected results at laboratories 1 and 2 respectively.

INTRODUCTION

Every year, approximately one million people fall ill from consumption of Salmonella contaminated food1. Poultry and pork producers globally are under pressure from national food safety agencies, other regulatory bodies and retailers to reduce Salmonella rates and to monitor prevalence of specific serovars such as S. Typhimurium and S. Enteritidis.

A simple, reliable and fast multiplex PCR assay would enable producers to quickly and accurately detect these targets in a single reaction, allowing them to make critical decisions on raw meat batch release days before a culture method would allow (figure 1).

MATERIALS AND METHODS

Sample Preparation
One-hundred-and-fifty-five naturally contaminated poultry samples representing 13 different matrix types were tested at laboratory 1. Additionally, 12 poultry samples representing 2 matrix types were inoculated with Salmonella Enteritidis or S. Typhimurium at laboratory 2.

RESULTS

Table 1. TaqMan® Salmonella Triplex Assay vs. alternative method summary from laboratory 1.

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Incubated organism</th>
<th>Salmonella Triplex Assay result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh chicken</td>
<td>S. Typhimurium</td>
<td>NaN</td>
</tr>
<tr>
<td>Fresh chicken</td>
<td>S. Typhimurium</td>
<td>NaN</td>
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<td>Fresh chicken</td>
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<td>Fresh chicken</td>
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<td>NaN</td>
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</tbody>
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CONCLUSIONS

The study demonstrated that the TaqMan Salmonella Triplex Assay with direct lysis provides a simple, rapid and reliable method for the detection of Salmonella spp., S. Typhimurium and S. Enteritidis in raw and seasoned chicken and parts of chicken compared to the alternative molecular methods.

Compared to other commercially available rapid Salmonella assays, the TaqMan Salmonella Triplex Assay also provides the ability to differentiate S. Typhimurium and S. Enteritidis from the other Salmonella spp.

REFERENCES


TRADEMARKS

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Figure 1. ISO reference method and TaqMan Salmonella Triplex Assay protocols.

Figure 2. Applied Biosystems™ RapidFinder™ Express Software v2.0