Simpósio Latinoamericano em Segurança dos Alimentos Santos - SP - Brasil 11 a 14 Nov, 2024

A Multiplex Real-Time PCR Assay for the Detection of Highly Pathogenic Salmonella Enterica (HPS) in Beef and Poultry

Hans-Henno Dörries¹, Cordt Grönewald¹, Rebecca Olsen², Stacy Stoltenberg², Patrice Chablain¹, **Lauane Gonçalves de Araújo**³

^{1.} Hygiena[®] Diagnostics GmbH, Postdam, Germany

BRAFP

- ^{2.} Hygiena LLC, Camarillo, CA, United States
- ^{3.} Hygiena do Brasil, São Paulo, SP, Brazil

The USDA and industry work to find a balance to continue to offer wholesome, nutritious meat products while reducing risk of illness from Salmonella for humans. There is a need in the poultry and beef industries for an easy-to-use method to identify the risk of Salmonella in food samples based on virulence or pathogenicity, instead of simply presence or absence. This work involved the development of a realtime PCR assay to detect Salmonella in relevant food samples based on genes associated with pathogenicity. This multiplex PCR assay is designed with three HPS targets (HPS-B, HPS-A, HPS-X) associated with virulence, and combinate with a Salmonella spp. target and an internal control. Analysis of enrichments and isolates from chicken, turkey, pork and beef samples from regulatory (USDA-FSIS) or industry were prepared for specificity and applicability study. Specificity studies yield 100% inclusivity on 202 Salmonella serovars and 100% exclusivity on 53 closely related species of Enterobacteriaceae. Further, the assay was tested on enriched samples and isolates from each of the 4 major commodities: chicken, turkey, pork, and beef, and compared to data gathered by USDA-FSIS. Of the 129 isolates evaluated, the multiplex real-time PCR assay result agreed with the USDA data for the HPS-B, HPS-A, HPS-X, and Salmonella spp. targets with an accuracy of 99.2%, 98.4%, 99.2%, and 100%, respectively. The results support the assumption that highly pathogenic Salmonella can be guickly detected in meat and poultry with this next-generation method for Salmonella detection. This approach to Salmonella testing can enable the industry to make more risk-based decisions about their product to reduce the number of illnesses caused by Salmonella while continuing to provide consumers with nutritious and affordable meat.

Agradecimentos: