BEEF INDUSTRY SAFETY SUMMIT
March 3-5, 2015
Dallas, TX

Project Title: **Direct Rapid Detection of Beef Lymph Nodes Containing High Levels of Salmonella**

Presenter: **Mick Bosilevac** and Terry Arthur
Presenters email address: mick.bosilevac@ars.usda.gov
Mailing address: US Meat Animal Research Center
State Spur 18d
Clay Center, NE 68933

Category: Post-harvest research

Published: Unpublished to date

Objective: The objective of this work was to determine if beef lymph nodes containing Salmonella could be rapidly identified through direct testing without enrichment.

Experimental Design & Analysis:

Beef lymph nodes (1,038) were collected from beef carcasses during a study of Salmonella prevalence in lymph nodes. Flank (subiliac) lymph nodes were collected from carcasses of cattle finished in a region of high Salmonella prevalence and from cattle identified as likely harboring Salmonella positive lymph nodes. Individual lymph nodes were processed for enumeration and prevalence of Salmonella. A portion (1.2mL) of each lymph node suspension before enrichment was tested using the Roka Biosciences Atlas System SG2 Salmonella detection test. Results of the Atlas SG2 assay, culture prevalence and enumeration of CFU/g lymph node were compared and analyzed.

Key Results:

In summary, 450 of the lymph nodes were Salmonella culture positive, of which 232 had enumerable Salmonella present (0.31-5.34 log CFU/g). Atlas SG2 identified 189 (42%) of the culture positive lymph nodes, and 170 (73%) of the lymph nodes with enumerable Salmonella. The Salmonella level in the Atlas SG2 positive lymph nodes was 0.39 - 5.34 log CFU/g, mean 2.47 log CFU/g. For lymph nodes containing enumerable Salmonella identified as negative by Atlas SG2, the organism was present at 0.31 - 2.15 log CFU/g, mean 0.82 log CFU/g. In addition, Atlas SG2 identified 19 Salmonella positive lymph nodes that had Salmonella at levels below the limit of detection of enumeration (0.37 – 0.74 log CFU/g); and identified 20 lymph nodes as positive for Salmonella that could not be confirmed by the culture methods used. Further regression analysis showed that Atlas SG2 had a limit of detection of about 0.5 log CFU/g lymph node.

Industry Application:

Salmonella containing beef lymph nodes have been identified as a likely source of Salmonella in ground beef. Since lymph nodes can contain varying levels of Salmonella depending on the source of cattle (region, feed yard, etc...) a rapid method to identify problem lots and provide data for more directed interventions other than excising lymph nodes from all carcasses.