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Project Title: **Examination of Predictors of *Salmonella enterica* Contamination in Cattle Feedlot Environments**

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Objective: To identify a "predictor" or "environmental marker" that can be used to estimate *Salmonella* prevalence in a given feedlot environment. Further, to examine the correlation between environmental *Salmonella* contamination, *Salmonella* fecal shedding status, and prevalence of *Salmonella* in peripheral lymph nodes.

Experimental Treatments: Samples were collected from three feedlots located in BIFSCo Regions 3 and 5. Hide swab, fecal swab and environmental samples were collected from May to August 2013. On average 20% of cattle per pen were sampled from a total of 10 pens, and average pen size was 224 head. Hide and fecal samples were collected from cattle restrained in a squeeze chute, as they were being processed for growth promoter implant (approximately 75 days post arrival at the feed yard). Environmental samples from 5 pens per yard, including pen floor surface material, water tank, feed, and flies were collected from each of the participating yards. Approximately 90 days post-implant, cattle were shipped to a commercial abattoir for harvest and a subset of cattle sampled at implant were selected for lymph node and fecal swab collection. All samples were analyzed for *Salmonella* prevalence and level. For each carcass, six lymph nodes were collected, three from each carcass half, including the superficial cervical, subiliac, and popliteal.

Key Results:

1) Results indicate that *Salmonella* fecal shedding status does not appear to correlate with peripheral lymph node contamination within a given animal. Instead, peripheral lymph node contamination appears to be related to the percent of *Salmonella* super shedders present in a pen, and the resultant hide contamination levels of cohorts within that pen.

2) Enumerable levels of *Salmonella* in tank water and measureable prevalence in feed are potential indicators of aberrantly high levels of *Salmonella* in a given feedlot.

How can this information can be applied in the industry? The data collected suggest that aberrantly high levels of *Salmonella* contamination on cattle hides (defined here as hides contaminated at ≥ 10^3 CFU/100cm^2) are correlated with peripheral lymph node contamination with *Salmonella*. Analysis of feedlot environmental samples including surface material, tank water, feed and flies, suggests that enumerable levels of *Salmonella* in tank water and prevalence in feed are indicators of aberrantly high levels of *Salmonella* in a feedlot. Given the ease of collection and processing of these sample types, they represent good candidates for reliable "predictors" of feedlots that could benefit from pre-harvest interventions targeting *Salmonella*.

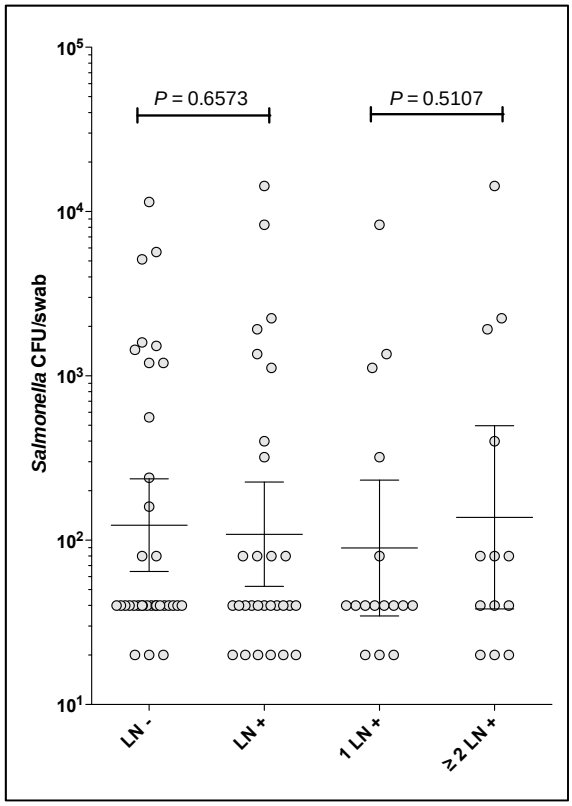

Figure 1. Comparison of *Salmonella* fecal shedding as measured by fecal swab at harvest, and peripheral lymph node (LN) contamination. Shedding levels detected for carcasses negative for *Salmonella* contamination (LN -) (n=34); carcasses positive for LN contamination (LN +) (n=29); carcasses found with one LN positive (1 LN +) (n=16); and carcasses found with more than one LN positive (≥ 2 LN +) (n=13).