Published February 1, 2019

2017 Reciprocal Meat Conference – Meat and Poultry Safety

Meat and Muscle Biology™

Presence and Characteristics of *Salmonella* Enterica Recovered from Subiliac Lymph Nodes of Beef Feedlot Cattle Enrolled in a Randomized Clinical Trial of Dietary Additives

K. Holzer[1]*, C. Weissend[1], K. Huebner[2], J. Metcalf[1], I. Georgnaras[1], K. Belk[1], P. Morley[2], and J. Martin[1]

[1]Center for Meat Safety and Quality, Colorado State University, Fort Collins, CO, USA;
[2]Clinical Sciences, Colorado State University, Fort Collins, CO, USA

Keywords: lymph node, microbiome, *Salmonella*, Tylosin
Meat and Muscle Biology 1(3):131 **doi:10.221751/rmc2017.124**

Objectives

The presence of *Salmonella enterica* in the lymphatic system of beef cattle presents a potentially important food safety issue for consumers and a significant production challenge for the beef industry. An understanding of pre-harvest factors which may influence the presence of *Salmonella enterica* in beef lymph nodes is of importance and should be considered as new feeding strategies or treatment plans are adopted. The objectives of this project were to evaluate the influence of pre-harvest feeding strategies on the presence and characteristics of *Salmonella enterica* associated with subiliac lymph nodes (SLN) of feedlot beef cattle.

Materials and Methods

Commercial steers and heifers (n = 5481 hd) were sourced for enrollment in a feeding trial at a commercial feedyard in the panhandle of Texas. Upon arrival at the feedyard (Spring 2016), the cattle were randomly assigned to 1 of 4 treatment groups until 10 pen blocks representing 1 pen of each treatment group (n = 10 pens/treatment). The 4 treatment groups reflected the inclusion of feed additives in finishing diets and specifically the inclusion and exclusion of Tylosin. Cattle were harvested at a commercial beef processing facility in Texas within a 3-wk period in the fall of 2016. Fifteen SLNs were collected from each pen (40 pens × 15 SLN = 600 SLN) at the time of slaughter for evaluation of *Salmonella enterica* presence. *Salmonella* isolated from the SLNs were further characterized by determining the serogroup and antibiotic susceptibility. Similarly, the microbial community of the SLN was assessed using the 16S rRNA gene of SLNs composited by pen.

Results

Overall, 84.6% of SLNs were positive for *Salmonella enterica* across the 4 treatment groups. Gross prevalence data suggests that treatment group had no impact on the number of SLNs that were positive for *Salmonella enterica;* however, the overall high prevalence agrees with previous studies which have demonstrated SLN *Salmonella* prevalence greater than 75% in feedlot cattle from the Southern region. Serogroup, susceptibility, and microbiome data will complement information related to *Salmonella* prevalence and provide further insight into the potential impact of pre-harvest feeding strategies on *Salmonella enterica* in the lymphatic system of feedlot cattle. The 16S rRNA microbiome analysis indicates that the top 3 phyla present in the composited SLNs were Proteobacteria (68.9%), Acidobacteria (8.9%), and Actinobacteria (8.8%). The microbiome did not differ among treatment groups ($P > 0.05$).

Conclusion

As the beef cattle industry moves toward adapting feeding and treatment strategies to combat the development of antimicrobial resistance, the impact of such motives on meat quality and beef safety must be explored. Relative to beef safety, mitigation of *Salmonella enterica* presence in the lymphatic system—and subsequently beef trim—is a priority for the industry. This study, which is part of a larger effort to evaluate tylosin alternatives, will provide valuable information regarding the impact these feeding strategies have on *Salmonella* in SLNs. This understanding will be useful in determining the role such strategies can play in producing safe beef.

