The emergence of antimicrobial resistance (AMR) is a growing global problem affecting human and animal health. Understanding the ecology of AMR among microbes, identifying resistance gene reservoirs, and implementing AMR mitigation practices in livestock production are critical to protecting animal and human health while meeting increasing food demands. Current efforts among our team of collaborators are focused on our long-term goal of describing the ecology and transmission of AMR gene reservoirs in the environment, identifying critical control points for AMR throughout livestock production systems to inform development of science-based intervention strategies, and effecting changes in practices among producers and consumers to improve animal health and food safety.

**OBJECTIVE**

Evaluate the impact of essential oil (EO) and forage concentration in beef cattle diets on the prevalence of antimicrobial resistant bacteria in freshly excreted manure and consolidated feedlot surface material.

**STUDY DESIGN**

**COMPLETELY RANDOMIZED DESIGN (10 Cattle/Pen):**

3 Forage Treatments X 2 Essential Oil Treatments x 7 Reps

<table>
<thead>
<tr>
<th>Treatments</th>
<th>80% Forage</th>
<th>47% Forage</th>
<th>14% Forage</th>
</tr>
</thead>
<tbody>
<tr>
<td>N O N O N O</td>
<td>AZ E. coli</td>
<td>TET E. coli</td>
<td>TET Enterococci</td>
</tr>
<tr>
<td>O N O N O O</td>
<td>80% Forage</td>
<td>47% Forage</td>
<td>14% Forage</td>
</tr>
</tbody>
</table>

**RESULTS**

Preliminary data suggests that dietary forage concentration may affect TET-resistant Enterococci concentrations in fresh manure (Fig. 1) with a 47% forage diet yielding the highest concentration and 14% yielding the lowest concentration. Tylosin-resistant Enterococci concentration in feedlot surface material also appears to be affected by forage concentration (Fig. 2). The data suggests little difference in concentrations of AMR bacteria as a result of essential oil in feed. Error bars in Fig. 1-3 represent standard error.

**CONCLUSIONS**

1. The essential oil (EO) used had little effect on AMR concentrations, suggesting that the efficacy of EO as a feed additive should be governed by the impact on meat quality and rate of gain without concern for increased risk of AMR bacteria in manure.
2. AMR contamination risk from feedlot manure does not appear to be impacted by dietary forage concentration.
3. With little impact by dietary forage concentration or EO on AMR bacteria prevalence in manure, it is important to examine manure treatment, storage and application strategies that may mitigate potential risks from manure-borne AMR bacteria.

**ACKNOWLEDGMENTS**

Funding for this research was provided by USDA-NIFA Award No. 2017-68003-26497.

We wish to extend our gratitude to Dr. Bing Wang, Linda Schott, Erin Stevens, Ece Bulut, Eric Henning, Autumn Dunn, Bridget Gile and Zhe Zhang for assistance with sample collection, preparation and analyses.