Presentation: An update and model assessment of a mixed treatment comparison meta-analysis of antibiotic treatment for bovine respiratory disease

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Abstract: Bovine respiratory disease (BRD) is the most costly disease of beef cattle. Numerous antimicrobials are currently registered for the treatment of BRD. However, often there will not be publically available data for the treatment comparisons of interest. An MTC meta-analysis is an extension of pairwise meta-analysis that uses a network of comparisons. An MTC meta-analysis combines direct and indirect estimates of efficacy from the network of trials in order to provide comparative efficacy estimates in the absence of publically available trial data. This analysis can result in an invaluable tool for producers and veterinarians in both guiding treatment decisions as well as ranking available interventions based on relative effectiveness. In 2013, members of our group published a MTC meta-analysis to assess comparative efficacy and rank antibiotic treatments for BRD in feedlot cattle. The antibiotic, gamithromycin was only represented by one placebo comparison trial in the 2013 model. Since that time, three trials comparing gamithromycin to other antibiotics have been published. The objectives of this current project were to update the network of BRD trials and to compare indirect efficacy estimates for gamithromycin from the original 2013 model with results from subsequently reported randomized trials. The 2013 model-predicted risk ratios and credibility intervals substantially overlap with the subsequently published direct estimates of efficacy from randomized trials. This demonstrates the success of the model in accurately predicting comparative efficacy. The results of this study serve both to strengthen the clinical decision making tool for treating BRD and advance our understanding of applying complex research synthesis methods to clinical decision making in the veterinary sciences.