the herd and cow levels in the model were 19.7 and 19.0%, respectively, while variation at the test date level was 61.3%, suggesting that the majority of the changes in MUN values relate to unmeasured nutritional and non-nutritional changes between test dates. Only 13.3% of the variation in MUN values was explained by the combination of studied factors, but these factors should be kept in mind when assessing low and high MUN values on dairy farms.

A Population Approach to Assess Antimicrobial Resistance in Commensal Coliforms of Feedlot Cattle

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Introduction

The objective of this study was to determine the magnitude and duration of apparent antimicrobial resistance in commensal fecal coliforms using a population-based approach in feedlot cattle.

Materials and Methods

Angus steers (n=370), weighing approximately 600 lb (273 kg), were purchased directly from two ranches in western South Dakota and placed in 42 open, concrete floor pens at the SDSU Ruminant Nutrition Research Center. Cattle were fed typical receiving rations with no antimicrobials. Two cattle from each pen were randomly selected for fecal sampling at days 0, 14, 28 and 42. From half the pens, one sampled animal was selected to receive a single injection of florfenicol (18 mg/lb; Nuflor, Schering-Plough Animal Health) on Day 11. Fecal samples were plated onto MacConkey agar. Ten lactose-positive colonies were selected and used for antimicrobial susceptibility testing to ten antimicrobials using the disk diffusion method. Antimicrobial sensitivity was dichotomized as sensitive or not sensitive. Data were summarized as proportion of cattle at each sampling day with all ten isolates susceptible.

Results and Conclusions

On Day 0 sampling, 57.9% of the cattle displayed pansusceptible flora to all antimicrobials tested. Antimicrobials where susceptibility was observed in less than 95% of cattle included tetracycline (63.9%), sulfasoxizole (85.5%), streptomycin (81.9%), and ampicillin (94.0%).

Source of cattle appeared to affect antimicrobial resistance patterns ($P<0.02$). In cattle administered florfenicol, antimicrobial susceptibility was greatly affected and declined in Day 14 samples for chloramphenicol (0%), ampicillin (0%), sulfasoxizole (0%), tetracycline (0%), amoxicillin/clavulanic acid (9.5%), and cephalothin (14.3%; $P<0.05$). The change in susceptibility in treated cattle began to return to levels consistent with non-treated cattle at Day 28 and further by Day 42, though antimicrobial susceptibility remained lower for chloramphenicol and amoxicillin/clavulanic acid ($P>0.05$), indicating a longer term antimicrobial susceptibility effect. Tetracycline susceptibility appeared to decline with time in non-treated steers ($p=0.04$) despite no exposure to tetracycline.