Evaluation of Virginiamycin Inclusion in the Diets of Feedlot Steers: Interplay between Rumen pH and Liver Health. Madeline E. Rivera¹, Luiz Fernando Dias Batista¹, Luís O. Tedeschi¹, ²Texas A&M University

Abstract: In the beef cattle system, liver abscesses are the most common liver abnormality and are the leading cause for condemnations at slaughter. Virginiamycin (VM) has been used to prevent sub-acute ruminal acidosis (SARA) and subsequently control liver abscess incidence. This study observed the interrelationship between VM inclusion (240 mg/hd/d), ruminal pH dynamics, and hepatic blood metabolites over a 150-d feeding trial. Housed in a Calan gate system, 120 Angus crossbred steers (291 ± 28 kg) were randomly assigned to 1 of 6 dietary treatments: no VM (T₀₀₀); VM for the last 50 d (T₀₁₀); VM for the last 100 d (T₀₁₁); VM for the first 50 d (T₁₀₀); VM for the first 100 d (T₁₁₀); and VM for 150 d (T₁₁₁). Steers were orally administered 2 indwelling smaXtec rumen pH and temperature recording boluses on d -4 and d 84. On d -7, 28, 56, 84, 112 and 140, blood samples were collected via jugular venipuncture and all plasma samples were analyzed for concentrations of albumin, alkaline phosphatase, direct bilirubin, total bilirubin, gamma-glutamyl transferase, and total protein using an automated blood analyzer (Carysta High Volume Chemistry Analyzer; Zoetis). Haptoglobin (HPT) was measured following a colorimetric method based on peroxidase activity. Data were analyzed using a random coefficients model with the pen as a random effect and animals within treatment as the subject. Results indicated that VM did not convalesce hepatic function (P > 0.05), but HPT had increased concentrations on d 84 for VM excluded treatments (42.75 vs. 93.25 mg/L). Comparatively, T₁₁₁ tended to have less time under pH 5.8 (2.50 h/d) when compared with T₀₀₁, T₀₀₅ and T₀₀₆ (5.27; 4.94; and 4.23 h/d, respectively; P = 0.107). Therefore, VM should be fed from the growing phase to slaughter to capture the full potential of the product on animal health status.

Keywords: ruminal pH, virginiamycin

The Effect of Supplementing Clostat 500 (Bacillus Subtilis PB6) to Yearling Steers in a Commercial Feedyard on Health, Salmonella spp. Prevalence, Feedlot Performance and Carcass Characteristics. Sara J. Trojan¹, Paul Rand R. Broadway², Nicole C. Burdick-Sanchez³, Jeff A. Carroll², Kristin E. Hales³, Alyssa B. Word⁴, Kendall J. Karr⁴, Ben P. Holland⁴, Guy Ellis⁴, Casey Maxwell⁵, Landon Canterbury⁶, Tyler Leonard⁶, Doug LaFleur⁶, Jerilyn Hergenreder⁵, ¹Peak Beef Cattle Nutrition and Management Consulting LLC, ²USDA-ARS Livestock Issues Research Unit, ³Texas Tech University, ⁴Cactus Feeders, ⁵Kemin Industries Inc.

Abstract: Crossbred beef steers, n = 2,100; 313 ± 38 kg initial body weight (BW) were used to evaluate Bacillus Subtilis PB6 supplementation to yearling steers. Cattle were blocked by arrival date and assigned randomly to pen within block; pens were randomly assigned to treatment within block. Treatments, replicated in 15 pens/treatment with 70 steers/pen, included: 1) control (CON), diets containing no supplemental direct fed microbials; 2) CLOSTAT (CLO), diets supplemented with 0.5 g/animal/d Bacillus subtilis PB6 (CLOSTAT 500, Kemin Industries, Des Moines, IA). Supplementing CLO decreased morbidity (P = 0.03), 10.38% (CLO) vs. 13.43% (CON), decreased the percentage of cattle treated once for bovine respiratory disease (BRD; P < 0.01), 9.14% (CST) vs. 12.76% (CON), and decreased BRD re-treatment rate (P = 0.03). Mortality did not differ among treatments (P = 0.23). Cattle removed from the study tended to be less for CLO than CON (53 vs. 73 animals, respectively, P = 0.06). The prevalence of fecal Salmonella was not different among treatments (P ≥ 0.35); overall fecal Salmonella counts tended to be less for CLO (1.59 log CFU/g) than for CON (2.04 log CFU/g; P = 0.07). Concentration of Salmonella in subiliac lymph nodes did not differ by treatment (P = 0.62); however, mean prevalence of lymph node Salmonella decreased 46% by CLO (28.66% vs. 15.48%, CON vs. CLO, respectively, P = 0.46). With dead animals and removals included, final BW was heavier for CLO steers than CON, (P = 0.05), and average daily gain (ADG, P = 0.08), and gain efficiency (G:F, P = 0.06) tended to be greater for CLO than CON. With dead animals and removals excluded, final BW, ADG, and G:F did not differ among treatments (P ≥ 0.30). Carcass traits were not different between treatments (P ≥ 0.15). Supplementing CLO improved health outcomes of yearling steers.

Keywords: cattle, Bacillus subtilis