

42 An ecological study of the percentage of feedlot cattle shedding detectable *Escherichia coli* O157:H7 in the feces and potential relationships to characteristics of the pen. D.R. Smith*, M.P. Blackford, S.M. Younts, R.A. Moxley, J.T. Gray, L.L. Hungerford, C.T. Milton, and T.J. Klopfenstein, *University of Nebraska, Lincoln*.

The objective of this study was to describe feedlot pens by the point-prevalence of cattle shedding *Escherichia coli* O157:H7 in feces, and to look for relationships between pen prevalence and other characteristics of the pen. Feces were collected from the rectum of all cattle in each of 29 pens from 5 midwestern feedyards. Fecal samples were subjected to selective enrichment, immunomagnetic separation, and selective plating. Isolates were tested by latex agglutination, standard identification methods and confirmation by PCR for genes coding O157, intimin, and shiga toxin. Each pen was tested once during the June-September study period. Pen size ranged from 36 to 231 (median 107) cattle. At sampling, cattle had been in the feedyard 19 to 108 (median 54) days, and the mean body weight per pen ranged from 347 to 533 kg (median 422 kg). Some cattle in every pen were shedding *E. coli* O157:H7 in the feces. The prevalence of cattle shedding detectable levels of the organism ranged from 0.7% to 79.8% (median 17.1%). Feedyards did not differ by pen prevalence (Kruskal-Wallis $P > .10$); however, the pen prevalence differed widely within feedyards (chi square $P < .001$). Pen prevalence was not correlated with pen characteristics such as temperature, pH, or cleanliness of the water in water tanks, pH of feed in the bunks, number of cattle, mean body weight, or number of days in the feedyard (Spearman rank correlation $P > .1$). Pen condition subjectively evaluated as dry, normal, or wet, was associated with the level of pen prevalence (Kruskal-Wallis $P < .05$). Specifically, wet pen conditions were associated with higher pen prevalence than pens in normal condition (Wilcoxon rank sums $P = .01$). *E. coli* O157:H7 should be considered an ubiquitous organism in pens of feedlot cattle; however, factors related to the pen environment may help explain the level of shedding by feedlot cattle.

Key Words: Feedlot cattle, *Escherichia coli* O157:H7, Food safety

43 Effects of intranasal versus intramuscular modified live vaccines and vaccine timing on health and performance of newly received beef steers. G. C. Duff*, K. J. Malcolm-Callis, D. A. Walker, M. W. Wiseman, M. L. Galyean, and L. J. Perino, *Clayton Livestock Research Center, New Mexico State Univ., Clayton, NM*.

Two studies were conducted to evaluate the effects of infectious bovine rhinotracheitis-parainfluenza3 (IBR-PI₃) vaccines and timing of vaccination on health and performance of newly received beef steers. In Exp. 1, two loads (120 steer and bull calves and 108 heifer calves for Loads 1 and 2, respectively) were used. Treatments were: 1) no vaccine (**Control**); 2) an intranasal (IN) IBR-PI₃ vaccine; and 3) an intramuscular (IM) IBR-PI₃ vaccine. Averaged across loads, no differences ($P > .10$) were noted for daily DMI during the study. For the 28-d receiving period, cattle given IN had a greater ADG ($P < .05$) and improved feed:gain than those given IM. No differences ($P > .10$) were noted among treatments for morbidity. In Exp. 2, 102 steer and bull calves were used, with treatments of: 1) Control; 2) no vaccine at processing, with an IM multiple antigen (IBR-PI₃-Bovine Viral Diarrhea-Bovine Respiratory Syncytial Virus; **IM-MA**) on d 7; 3) an IN IBR-PI₃ at processing with IM-MA on d 7; and 4) IM-MA at processing and on d 7. Daily DMI did not differ ($P > .10$) during the experiment. For d 15 to 28, animals given vaccines had greater ($P < .05$) ADG than controls, and those given vaccines at processing had greater ($P < .05$) ADG than those given delayed vaccination. For d 15 to 28 and the overall 28-d period, feed:gain was improved ($P < .10$) for vaccinated calves vs controls and improved ($P < .10$) from d 15 to 28 for animals vaccinated at processing vs delayed vaccination. No differences were noted for morbidity. Results suggest that when given only at processing, an intranasal IBR-PI₃ vaccine might have beneficial effects on gain and feed efficiency, but that there was no advantage to delaying vaccination until 7 d after arrival. In addition, modified live vaccines did not negatively affect performance during the first 7-d, and vaccines did not affect morbidity during the receiving period compared to controls.

Key Words: Beef cattle, Vaccines, Performance

44 Large round bale feeder design affects the occurrence of aggressive interactions in beef cows. L. Korzun*, D.D. Buskirk, T.M. Harrigan, D.R. Hawkins, and A.J. Zanella, *Michigan State University, East Lansing, MI*.

Round bale (RB) hay feeders are widely used but the impact of their design on behavior, welfare and performance of cows has not been investigated. Non-lactating, gestating beef cows ($n=80$) were used to evaluate four designs of RB feeders. Cows were allocated to one of four treatments in four outside pens. Each pen was assigned to one RB feeder treatment: I) Ring (R), II) Cone (C), III) Cradle (CR), or IV) Trailer (T). Cows were given *ad libitum* access to hay in the feeders. A video camera was installed in each pen and continuous recording was carried out from 800 to 1800 h for five days using time lapse video photography. Tapes were decoded using check sheets. Five minutes of continuous observation was carried out every thirty minutes from 830 to 1730 h. Each experimental group was observed for 475 minutes (19 observations/day x 5 minutes x 5 days). The frequency of feeding bouts and aggressive interactions around the feeder was recorded. Data were analyzed using SAS[®]. The frequency of aggressive interactions was affected by feeder design. Animals which had access to the R and C feeders showed lower frequency of aggressive interactions than animals kept in the T or CR treatment group ($p < 0.001$). The number of aggressive interactions/5min observation recorded for R, C, T and CR feeders (Mean SEM) was: R= 0.48 0.055; C=0.58 0.055; T=1.210.055 and CR=1.850.055. The study of animal behavior is typically considered in relation to welfare issues. This work, however, showed that behavioral data might help to improve the design of round bale feeders. The shape of the feeder correlated with the number of observable aggressive interactions and this may contribute to the amount of hay wasted. We hypothesize that animals fed by circular feeders perceived less obstacles in their flight zone and therefore were less likely to actively displace other animals. By using behavioral data to design feeders, producers will be able to save considerable feed cost and improve the welfare of cows.

Key Words: Feeding behavior, beef cattle, aggressive interactions

45 Effect of a tylosin tartrate pellet included with component brand implants on the incidence of implant site abscesses in steers and heifers. W. G. Zollers, Jr.*¹, D. L. Cook¹, T. H. Janes², W. E. Barton², and G. D. Hindman¹, ¹*Ivy Laboratories, Overland Park, KS*, ²*CAVL, Inc., Amarillo, TX*.

Implanting growth promotants in the middle one-third of the ear of feedlot cattle breaks the skin in a highly contaminated area, which can lead to formation of an implant site abscess. The implant site abscess rate generally averages 5 to 8% but can exceed 15% in a single pen of cattle. Abscesses result in unrealized gains totaling millions of dollars in loss for the cattle industry. Although programs to promote sanitation during the implanting process reduce the rate of abscess formation, implant site abscesses are not completely eliminated. Adding a separate pellet of tylosin tartrate, an antibacterial agent, to the implant could proactively reduce abscess incidence. An implant site abscess induction model was developed to reliably create a 100% abscess rate in test animals. This model was used to test the ability of a tylosin tartrate pellet to reduce implant site abscess incidence in animals expected to develop an implant site abscess. Two abscess challenge studies were completed to test Component steer implants and Component heifer implants with and without the tylosin tartrate pellet. In both studies, abscesses were induced in all cattle at implanting (Day 0). Implant sites were observed on Day 6, 10, 16, 21, 28 and 35 postimplantation. In the steer study, three Component implants (TE-S, T-S and E-S), each with and without the tylosin tartrate pellet, were tested. For each Component implant on each day of observation, abscess rate was significantly lower ($P < 0.001$) in steers treated with the tylosin tartrate pellet. In the heifer study, two Component implant formulations (TE-H and E-H), each with and without the tylosin tartrate pellet, were tested. For each Component implant at each implant site observation, abscess rate was significantly lower ($P < 0.0001$) in heifers treated with the tylosin tartrate pellet. Results prove that significantly fewer implant site abscesses are induced if a tylosin tartrate pellet is added to the implant.

Key Words: Implant, Cattle, Implant Site Abscess