with a poly-lactide-co-glycolic-acid polymer allowing slow release of eprinomectin following injection with a label claim for protection against reinfection with *Cooperia oncophora* and *Cooperia punctata* for 100 d and *Ostertagia ostertagi* for 120 d. Pour-on ivermectin claims 21 d control for *C. punctata* with 14 for *O. ostertagi* and *C. oncophora*.

Materials and Methods

Nine-hundred and twenty nine spring-born calves grazing on 22 pastures in Virginia, USA were enrolled. Pastures were permanent and continuously grazed (stocking rate of 0.5 to 1.5 ha/pair).One-third of the calves in each pasture were assigned to ERE, the other two-thirds were assigned to POI. Calves assigned to treatments were blocked by sex, sire, artificial insemination (AI) vs natural service, Angus vs Simmental sired, and age. Calves were assigned, weighed, and treated in late June/early July when gastrointestinal parasite infections in calves increase as grazing replaces nursing and seasonal conditions promote infective L3 larval development and distribution. Calves were weighed mid-trial (average= 49 d post-enrollment) and again at weaning (average = 103 d post-enrollment). Fecal samples from a subset of calves were tested for fecal egg counts from each treatment group within each pasture at the start of the study and again 14 d later for fecal egg count reduction evaluation as well as at weaning. Care givers and study personnel were blinded to calf treatment assignments. Weight gains were analyzed using PROCC GLM of SAS version 9.3. The analyses were performed separately for the 3 outcome variables. Other variables in the models included location, gender, crossbreed, AI vs. natural service, age of dam, treatment (ERE or POI) and 2-way interactions. Backward elimination procedure created a final model ($P \leq 0.1$ for inclusion) with treatment forced into the model.

Results

Calves gained, on average, 209 lb (94.8 kg) from enrollment to weaning with a standard deviation of 63.9 lb (29.0 kg). Weight gain differences for ERE vs POI for start to mid-trial and mid-trial to weaning were not significant ($P>0.05$). There was a 5.5 lb (2.5 kg) advantage in weight gain for the ERE over the POI calves ($P=0.04$) from enrollment to weaning. Of the 22 pasture groups, 10 had mean gains where POI was superior to ERE, ranging from a 0.09 (0.04 kg) advantage to a 43.6 lb (19.8 kg) advantage. Twelve pastures had mean gains where ERE was superior to POI ranging from an advantage of 0.44 lb (0.2 kg) to 63.9 lb (29.0 kg). Fecal egg count analyses and coprocultures confirming that pastures were naturally infected with both *Cooperia* spp and *Ostertagia* spp are reported elsewhere.

Significance

Treatment of nursing calves at mid-summer with ERE showed a measureable but modest increase in weight gain compared to. calves treated with POI. The location by treatment interaction indicates parasite challenge differences due to stocking rates, grazing history and different pasture conditions. Housing all of the calves in same pasture might have had an influence on the outcome, but was preferable to housing ERE and POI calves in separate pastures where pasture variation might have large and immeasurable effects. Calves treated with ERE might have consumed and killed larvae, thus reducing the contamination challenge for the POI calves. The large variation in calf gain (SD=63.9 lb or 29.0 kg) suggests that other factors, such as dam milk production and genetic propensity for **growth)than those used in our models may be major contributors to calf gain.** In light of the current high price for weaned calves, even the modest increase in gains makes the use of ERE financially viable. Users should be aware, however, that in some settings there may be no weight gain benefit to treatment with ERE.

Zelnate™: a novel approach to BRD management in cattle

J. Nickell, DVM, PhD, DACVPM; **D. Keil**, DVM, PhD, DACVM; **T. Settje**, BS
Bayer Animal Health, Shawnee, KS 66216

Introduction

Bovine respiratory disease (BRD) continues to have a major economic impact on the beef and dairy industries while public perception supports reduced antimicrobial use. The objective of this research was to evaluate the efficacy of a novel non-antimicrobial, CpG motif-based DNA immunostimulant formulated in a liposome carrier (Zelnate) in the management of BRD. The program was composed of 2 phases: 1) product development and licensure, and

2) evaluation of the clinical benefit of Zelnate relative to a commercially available antimicrobial when administered in a metaphylactic fashion.

Materials and Methods

Phase 1 of the research program consisted of a *Mannheimia haemolytica* (Mh) disease model in which lung lesions were the primary outcome parameter. On day 0, 3 to 4 month old Holstein steer calves were intratracheally challenged with Mh. On day 5, lung lesions were scored by a trained and blinded investigator. In 2 separate studies, Zelnate was administered on either day 0 (Study 1; n=32/treatment group) or day 1 ([24 hours after Mh challenge] Study 2; n=40/treatment group) and compared to a no-treatment control group. Phase 2 consisted of a field BRD metaphylaxis study within a commercial US feedlot. Cattle at medium-risk for developing BRD were enrolled by the investigator. On day 0, cattle were metaphylactically administered either Zelnate or tilmicosin (Micotil®) (n=1002/treatment group), administered a standard feedlot processing regimen, individually weighed, and allocated to pens (167 head/pen). Following a 3-day moratorium, cattle were clinically evaluated daily for BRD until day 56. Cattle meeting the predefined BRD case definition were treated with a commercially approved antimicrobial. Calves that died/euthanized were necropsied. On day 56, a bodyweight was collected on all remaining calves.

Results

In Phase 1 (Study 1), a reduction (P=0.03) in lung lesions was observed among calves administered Zelnate (6.3%, 95% confidence interval [CI] = 4.3-8.3%), compared to no- treatment control calves (12.1%, 95% CI = 8.9-15.3%). In Study 2, a reduction (P=0.04) in mortality was observed among cattle receiving Zelnate (2.5%; n=1) relative to the no-treatment controls (20%, n=8). In Phase 2, no significant differences were observed between treatment groups for BRD morbidity, repulls, chronicity, case fatality, average daily gain, and feed efficiency (P>0.05).

Significance

Within the Mh disease model, the outcomes from Phase 1 indicate that cattle administered Zelnate had significantly reduced lung lesions (Study 1) and mortality (Study 2) compared to no-treatment controls. Phase 2 outcomes indicate that cattle metaphylactically administered Zelnate performed in a comparable fashion to calves receiving tilmicosin. These data suggest that Zelnate may be non-antibiotic option for metaphylaxis among cattle at medium-risk of developing BRD.

Assessment of periparturient behavior in beef cattle using accelerometers

J. E. Bayne, DVM[1]; **P. H. Walz**, DVM, MS, PhD, DACVIM[2]
[1]Department of Clinical Sciences, Auburn University, Auburn, AL 36849
[2]Department of Pathobiology, Auburn University, Auburn, AL 36849

Introduction

A large percentage of calf death loss in cow-calf operations occurs during the intrapartum period, with the majority a result of dystocia. The usefulness of commercial activity monitors to detect changes in behavior indicative of impending parturition has not been fully explored. Research objectives included characterization of behavioral indices during the periparturient period in beef cattle and the ability of changes in behavioral indices from baseline to accurately predict impending parturition in individual cows.

Materials and Methods

Activity data were collected from 40 mixed-breed beef cows housed on pasture using accelerometers (IceQube™, IceRobotics™). Accelerometers were placed on hindlimbs of periparturient beef cows for a minimum of 30 days prior to calving and removed 7 days post-calving. The number of steps, standing time, lying time, and number of lying bouts were continuously recorded at 15 minute intervals throughout the study period.