Results

All animals remained healthy during the study, and tolerated injection of the product in the ear well. Plasma concentrations over time will be shown during our presentation. Maximum concentrations were 6.3 ± 2.3 mg/mL, observed from 4-24 hours after drug administration. The AUC_{0-LOQ} was 376 mg•h/mL, and the $t_{>0.2}$ was 183 hours, or over seven days above the therapeutic concentrations for bovine respiratory disease (BRD) pathogens. These concentrations provide therapeutic concentrations for sufficient time to allow single dose efficacy for BRD.

Conclusions

The data from this study supports the hypothesis that one dose of NAXCEL XT 200 Sterile Suspension (3.0 mg/lb; 6.6 mg/kg BW) will provide therapeutic concentrations in plasma for at least seven days after SC injection in the ear of cattle. Therefore, the use of this formulation of ceftiofur will ensure that a full course of therapy is provided with the convenience of a single injection.

Reproductive Performance Following Timed Artificial Insemination in Silage-fed Beef Cows: the Effects of Synchronization Method and Postpartum Energy Intake

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Many studies have examined methods for estrous synchrony in beef cows, yet very little controlled research has addressed the interaction between postpartum energy intake and synchrony system. The objectives of this study were to compare the effectiveness of two estrous synchronization methods (Ovsynch or CIDR®) for use in timed artificial insemination (TAI) programs in silage-fed beef cows, and to examine interactions between synchronization method and postpartum energy intake. It was hypothesized that a modified CIDR program[1], which utilizes progesterone and estradiol benzoate (EB), would result in enhanced reproductive efficiency in underfed cows when compared to an Ovsynch program.

Prior to calving, Hereford-cross cows (53 and 64 head for years 1 and 2, respectively) were assigned to one of six treatments arranged in a 3 x 2 factorial design: three levels of silage (Low, Medium and High) and two methods of estrus synchronization (Ovsynch or CIDR) stratified by parity and predicted calving date. Cows were fed grass / clover silage, with dry matter intakes of 1.4%, 1.7% and 2.0% of body weight for the Low, Medium and High groups, respectively. Ovsynch treatment consisted of 100 µg of gonadotropin-releasing hormone (GnRH, Cystorelin®) IM on day 0, 25 mg of prostaglandin $F_{2\alpha}$ (Lutalyse®) IM on day 7 and 100µg of GnRH IM again on day 9, with insemination 16 hours later. CIDR treatment consisted of intravaginal insertion of a CIDR® implant with 1 mg EB (estradiol benzoate 0.5mg/ml in alcohol) IM and 100mg of progesterone (progesterone 50mg/ml in alcohol) IM on day 0, 25mg of prostaglandin $F_{2\alpha}$ (Lutalyse®) IM and removal of the implant on day 7, followed by 1 mg of EB IM 24 hours later, and insemination 28 hours after the final EB injection.

Percent pregnant following TAI tended to be greater for CIDR cows (69%) when compared to Ovsynch cows (53%, $P=0.07$). The probability of pregnancy depended on diet ($P<0.05$) and was subject to a diet-year interaction ($P<0.05$); specifically, cows with higher postpartum energy intakes performed better in year 1, but not in year 2. In year 1, conception rates were 59, 75 and 89% for the Low, Medium and High groups, respectively; in year 2 conception rates were 55, 50 and 47%, respectively ($P=0.9$). The reason for the difference between years is not readily apparent, but average body condition score was lower for the second year of the study (data not shown). Breed, parity, pen, insemination sire, AI technician, calving-to-insemination interval, body condition score or live weight at treatment were not associated with the probability of reproductive success following TAI.

The limited power of the study precluded demonstration of a clear statistical interaction between diet and synchrony method. Nonetheless, it appears that the advantage gained from CIDR versus Ovsynch accrued largely in the poorly-fed groups, i.e., those cows in the low energy groups in year 1 and all three groups in year 2. This gives support for the initial hypothesis that CIDR treatment would be beneficial under conditions of underfeeding when compared to Ovsynch. One would expect the mechanism to involve enhanced cyclicity in the better fed cows, and this logically would be reflected in enhanced BCS or live weight. However, the effect of diet on reproductive success in year 1 was statistically independent of estrus cyclicity, BCS and live weight (data not shown). Furthermore, overall reproductive success was not greater in cyclic cows when compared to non-cyclic cows, being 67 and 60%, respectively ($P>0.50$). We can hypothesize that diet may have affected the ovulatory or post-insemination endocrine or physical utero-ovarian environment leading to either improved gamete or embryo quality or enhanced maintenance of pregnancy in cows with greater energy intake.

These preliminary data indicate that both the Ovsynch and CIDR methods are capable of achieving a high degree of synchrony with very acceptable reproductive success following a single timed insemination in silage-fed postpartum beef cattle. This appears to hold true over a range of postpartum energy intakes. There was a trend that suggested the CIDR method performs better than the Ovsynch method in underfed cows. In general, however, achieving very high pregnancy rates following a single insemination is possible with both methods, but may require optimal postpartum energy intake.

References

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Antimicrobial Resistance of Enteric *E. coli* in Beef Cattle Treated with Antibiotics

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Introduction

It is crucial to the future of animal agriculture that veterinarians and livestock producers understand how to treat food animals in an intensive environment, while preventing or reducing the development of antimicrobial resistant bacteria. However, little is known about the actual development and transmission of antibiotic resistant organisms within or among groups of animals. In addition, little is known about the persistence of resistant organisms or their potential impact on the food production industry. The objective of this study was to characterize the development and dissemination of antimicrobial-resistant organisms in beef cattle treated with antibiotics.

Materials and Methods

The study population consisted of 48 steers with no history of antibiotic administration or prior health problems since birth. Twenty-four steers were randomly allocated into two treatment groups to be administered different doses of ceftiofur hydrochloride. Group A received the lower dose of ceftiofur hydrochloride for a longer time, and Group B received a higher dose of ceftiofur hydrochloride for less time. Both doses were given subcutaneously according to labeled directions. No direct contact was allowed between the two treatment groups. The remaining 24 steers were also allocated into each group and pastured with the treated groups to serve as untreated controls. Fecal samples