

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 under-feeding 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.

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### 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

from all 48 animals (treated and controls) were collected one week prior to antibiotic administration, and daily for one week following antibiotic administration. Fecal samples were also collected weekly for three additional weeks to monitor changes in antimicrobial resistance over time, as well as prior to the movement of the animals out of state for feeding, to determine pre-market presence of resistant organisms. Fecal samples were tested for non-specific *Escherichia coli*, and antimicrobial susceptibility patterns of five isolates from each sample were determined using the disk diffusion method. Fecal samples were considered to have resistant *E. coli* organisms if at least one of the five isolates exhibited resistance against a particular antimicrobial.

### Results and Conclusions

Overall, 2807 *E. coli* isolates were tested for resistance against ceftiofur, tetracycline and enrofloxacin. Prior to treatment, 13 to 17% of fecal samples from steers contained *E. coli* isolates resistant to tetracycline. No resistance to ceftiofur or enrofloxacin was detected in any isolates from either group of animals at baseline. Little resistance to ceftiofur occurred following treatment with ceftiofur hydrochloride. Only 4% of samples

contained ceftiofur-resistant *E. coli* organisms in the three days following treatment. Only one animal, a control, had more than one resistant sample during these three days. No resistance to ceftiofur was detected after three days post treatment, or in the pre-market samples taken four months after antibiotic administration. Resistance to tetracycline changed daily and did not appear to occur in any apparent pattern. At no time during the monitoring period did any isolates exhibit resistance to enrofloxacin. Preliminary findings support our hypothesis that food-producing animals properly treated with antimicrobials may develop only transient antimicrobial resistance, and therefore may pose little risk towards development of antimicrobial resistance in the human food supply. In addition, it is possible that untreated animals can acquire transient antimicrobial-resistant organisms, which can be subsequently lost when removed from the contaminated environment. Understanding the ecology of antimicrobial resistance in food animal populations may help the veterinary practitioner and the producer make well informed decisions regarding the health of food animals, potentially leading to effective and practical intervention programs based upon scientific evidence.

## *Cryptosporidium* and *Giardia* species – Prevalence and Risk Factors in Western Canadian Cow-Calf herds. Are Cow-Calf Herds an Important Reservoir for These Parasites?

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### Abstract

The protozoan parasites *Cryptosporidium* species and *Giardia* species are commonly found in cattle feces and can present important risks to human health, with especially serious consequences when immunocompromised individuals become infected. The purpose of this study was to examine the infection prevalence of *Cryptosporidium* species and *Giardia* species in cow-calf herds at calving, and to determine risk factors associated with infection. Fresh fecal samples were collected from individually identified heifers/cows and calves in the spring of 2002. Samples were collected from 578

heifers and cows on a total of 61 farms, and 608 calves on 100 farms. Fifty-two of the 100 farms used for calf sample collection matched the heifer and cow herds sampled. The mean herd size was 150 head. The fecal samples were scored on a scale of 0 to 3 (0= firm, 3=watery) to identify fecal consistency. Data were collected to assess risk factors for parasite shedding, including herd management factors, age, sex, breed, health status/clinical signs and treatment history. A quantitative sucrose gradient immunofluorescent antibody test was conducted on the fecal samples to identify *Cryptosporidium* species oocysts and *Giardia* species cysts. The number of oocysts/cysts per gram of feces was