than 2,000 moderate shedders and more than 20,000 low shedders. The frequency of super-shedders among culture positive cattle in infected herds is being investigated at this time. Based on this new dimension of super-shedders, a significant proportion of low shedders are likely to represent "pass-through" and not active true infections. As little as 10 ml of manure (1×10^7 cfu of MAP) from a super-shedder could both infect another calf or heifer and result in the manure of the heifer being culture-positive with several colonies per tube. Previous research from this laboratory has shown that "pass-through" can result when cattle consume manure from cattle with clinical Johne's disease. The challenge to the Johne's academic community will be to develop diagnostic methods to detect these super-shedders in a cost efficient manner and eliminate them from the herd prior to massive environmental contamination.

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Uterine Bacterial Isolates and Reproductive Performance in Lactating Holstein Cows with Uterine Health Disorders, Large Calves and Fever

Doug Hammon, *DVM, PhD;* **Heidi Johnson,** *BS;* **Cory Wareham,** *BS;* **Rusty Stott,** *DVM*
Department of Animal Dairy and Veterinary Sciences, Utah State University, Logan, UT

Introduction

Uterine health disorders are common in dairy cows and result in reproductive inefficiency and economic loss in dairy herds. Specific uterine bacteria associated with some uterine health disorders have been described. However, information regarding the relationship between calf birth weight and uterine bacteria is lacking. The aim of this study was to evaluate relationships between uterine bacterial isolates during the first four weeks after calving, uterine health disorders (metritis, retained placenta [RP], clinical and subclinical endometritis), fever and calf birth weight. The impact of uterine health disorders on reproductive performance was also evaluated.

Materials and Methods

One hundred-five Holstein cows were used to investigate the relationship between uterine bacterial isolates, uterine health disorders, fever and calf birth weight in lactating Holstein cows. Aerobic and anaerobic uterine cultures were performed twice weekly from weeks 1 to 4 postpartum. Cows were examined at 28 days postpartum, for clinical endometritis (purulent cervical discharge on vaginal examination) and at weeks 4 and 8 postpartum for subclinical endometritis (> 15% neutrophils on endometrial cytological exam). Calves were weighed at birth and birth weights were recorded. Rectal temperatures were recorded from days 1 to 10 postpartum, and fever was defined as a rectal temperature ≥ 103°F for ≥ two days. The presence and character of uterine discharge (or retained placenta) was recorded daily from days 1 to 10 postpartum. Reproductive performance was measured and related to uterine health disorders. Statistical differences were determined by T-test using Statistix® 8 statistical software.

Results

Of 105 cows, 21% developed RP, 22% metritis (fetid discharge), 12% developed clinical endometritis (pres-

ence of pus on vaginal examination at day 28), 18% developed fever, and 51 and 31% developed subclinical endometritis at days 28 and 56, respectively. Cows with RP had a significantly (P<0.05) higher prevalence of *Escherichia coli* (week 1) and *Prevotella* sp (weeks 2, 3 and 4). Cows with metritis had a significantly (P<0.05) higher prevalence of *E. coli* (week 1), *Arcanobacterium pyogenes* (week 2), and *Prevotella* sp (weeks 1, 3 and 4). Cows with clinical endometritis had a significantly (P<0.05) higher prevalence of *E. coli* (weeks 1, 2 and 3) and *Fusobacterium necrophorum* (week 2). Cows with fever had a significantly (P<0.05) higher prevalence of *E. coli* (week 1), *A. pyogenes* (week 2) and *F. necrophorum* (week 2). Cows with subclinical endometritis (day 28) had a significantly (P<0.01) higher prevalence of *E. coli* (weeks 1, 2 and 3) and *A. pyogenes* (weeks 2 and 3). Cows with subclinical endometritis (day 56) had a significantly (P<0.05) higher prevalence of *E. coli* (week 1) and *Prevotella* sp (weeks 1 and 3). Cows with large calves (highest quartile birth weight, > 104 lb; 47.3 kg) had a significantly (P<0.05) higher prevalence of *E. coli* (week1) and *A. pyogenes* (weeks 2 and 3) compared to cows with small calves (lowest quartile birth weight, <

90 lb; 41 kg). Cows with RP, fever and metritis had significantly (P< 0.05) lower first service conception rates, compared to cows without these disorders. Cows with subclinical endometritis at day 56 had significantly (P < 0.05) lower first service conception rates and higher days open, compared to cows without subclinical endometritis at day 56.

Significance

These data suggest that uterine health disorders, large calves and fever in dairy cows are associated with a higher prevalence of major uterine bacterial pathogens during the first four weeks postpartum. *E. coli* and *A. pyogenes* during the early postpartum period were especially common in cows with uterine health disorders, large calves and fever. Furthermore, reproductive performance in cows with some uterine health disorders and fever was impaired. These data may help guide practitioners in providing appropriate therapies to reduce the impact of uterine pathogens on uterine health in postpartum dairy cows.

Effect of Different Prostaglandin Treatment Protocols on Luteolysis and Ovulation in Dairy Cows

O. Szenci, *DVM, PhD, DSc[1];* **A. Répási,** *DVM[1];* **J. Sulon,** *PhD[2];* **J. Reiczigel,** *PhD[3];* **J.F. Beckers,** *DVM, PhD[2]*
[1] *Clinic for Large Animals, Faculty of Veterinary Science, Szent István University, Üllö – Dóra major, Hungary*
[2] *Department of Physiology of Reproduction, Faculty of Veterinary Medicine, University of Liege, Liege, Belgium*
[3] *Department of Biomathematics and Informatics, Faculty of Veterinary Science, Szent István University, Budapest, Hungary*

Introduction

During the past 25 years, several methods were developed to synchronize estrus in dairy cattle. Synchronization with prostaglandin F2α (PGF2α) is successful when cows are bred at a detected estrus because estrus detection rates and artificial insemination (AI) are more efficient than daily detection of estrus (Stevenson and Pursley, 1994). The success of estrous induction with PGF2α depends on the presence of a functional corpus luteum (CL). In case of a palpable CL, Archbald *et al* (1994) found that the percentage of milking cows observed in estrus within seven days after treatment (25 mg of PGF2α) was 55% (61/111). This management tool still

does not control the time of AI, because estrus detection continues to be necessary, which is evidenced by the lower pregnancy rate after timed AI compared with AI after detected estrus. This might be partially explained by the variation in time of ovulation over periods of five days with respect to time of AI (Stevenson *et al*, 1987). Various attempts have been made to overcome this variability in response to PGF2α treatments. The administration of other hormones in conjunction with PGF2α, such as progesterone, estradiol benzoate, human chorionic gonadotropin (hCG) and gonadotropin releasing hormone (GnRH) (Deletang 1975; De Rensis and Peter 1999; Pursley *et al*, 1996), have been attempted. There was a better degree of synchronization but the pregnancy rate