

Case Management of *Ureaplasma diversum* in a Replacement Dairy Heifer Operation and a Commercial Beef Herd

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Abstract

Ureaplasma diversum was isolated from vaginal swabs taken from a subset of confined 18-month old dairy heifers that exhibited reduced conception rates. The heifers had been exposed to Holstein bulls for 90 days and presented with clinical signs of abortion, failure to conceive, and had reddened vulvas with small blister-like lesions. Vaginal swabs of the lesions were positive for *U. diversum* using the polymerase chain reaction test. At the time of diagnosis, the Holstein bulls were housed with beef bulls used for the producer's commercial cow/calf operation. Preputial swabs confirmed that all dairy and beef bulls were positive for *U. diversum*. The dairy heifers and all bulls were sexually rested for 28 days and fed 350 mg chlortetracycline (CTC)/head/day. Eleven of the 12 bulls remained preputial swab-positive for *U. diversum* after 28 days of CTC treatment. Following the 28-day rest period, the Holstein bulls were returned to the dairy heifer pen. Of 250 dairy heifers, 238 were pregnant 90 days after the bulls were re-introduced. Additionally, the producer elected to use the *Ureaplasma*-positive beef bulls to breed his commercial beef cows and heifers. Upon rectal palpation, 282 of 285 beef cows and heifers were pregnant in the fall. These results indicate that feeding 350 mg CTC/head/day did not eliminate *U. diversum* from the prepuce of the bulls. *Ureaplasma* in this case was either non-pathogenic, or the beef cows and dairy heifers were immune due to prior exposure, which allowed *Ureaplasma*-positive bulls to breed both dairy and beef cattle and achieve high conception rates.

Keywords: bovine, infertility, ureaplasma, abortion

Résumé

Ureaplasma diversum a été isolée d'écouvillons vaginaux obtenus à partir d'un groupe de taures laitières confinées de 18 mois qui avaient un taux de conception

réduit. Les taures avaient été présentées à des taureaux Holstein pendant 90 jours et montraient des signes cliniques incluant l'avortement, l'échec de la conception et une rougeur au niveau de la vulve avec des petites lésions de type vésiculaires. *U. diversum* a été isolée des écouvillons vaginaux des lésions grâce au test d'amplification en chaîne par polymérase. Au moment du diagnostic, les taureaux Holstein étaient logés avec des taureaux de boucherie que le producteur gardait pour son élevage commercial vaches-veaux. Des écouvillons prépuceux confirmèrent la présence d'*U. diversum* chez tous les taureaux laitiers et de boucherie. Les taures laitières et tous les taureaux n'ont pas été accouplés pendant 28 jours et ont reçu 350 mg de chlortétracycline (CTC) par tête par jour. *U. diversum* était encore présente dans les écouvillons prépuceux chez 11 des 12 taureaux testés 28 jours après le traitement avec la CTC. Après la trêve de 28 jours, les taureaux Holstein ont été retournés à l'enclos des taures laitières. Parmi les 250 vaches laitières, 238 étaient devenues gestantes 90 jours suivant la réintroduction des taureaux. De plus, le producteur décida d'utiliser les taureaux de boucherie porteurs d'*U. diversum* pour s'accoupler avec ses vaches et taures de boucherie commerciales. Suite à la palpation rectale, 282 vaches et taures de boucherie sur 285 étaient devenues gestantes dès l'automne. Ces résultats indiquent que l'administration de 350 mg de CTC par tête par jour n'a pas éliminée *U. diversum* du prépuce des taureaux. Toutefois, il est possible qu'*Ureaplasma* n'était alors plus pathogénique ou encore que les taureaux de boucherie et les vaches laitières s'étaient immunisés suite à l'exposition précédente. Ceci aurait permis aux taureaux toujours porteurs d'*Ureaplasma* de fertiliser les bovins laitiers et de boucherie et d'accroître le taux de conception.

Introduction

Ureaplasma diversum is an opportunistic, venereally-transmitted reproductive pathogen associ-

ated with granular vulvo-vaginitis, endometritis, salpingitis, spontaneous abortion and infertility.^{1,3,4} The organism in cattle is carried in the vulva and vagina of females; the prepuce, distal urethra and semen of males; and the nasal passages of both. In addition to venereal transmission, animals may be exposed to the organism by nuzzling or contact with mothers, during passage through the infected vagina at birth or via nasal passages when cleaning their young after birth.²

History

In April 2005, a commercial dairy heifer producer in western Kansas reported low pregnancy rates in breeding-age heifers. The heifers were housed in outside pens with pipe and cable fences, concrete fence-line feed bunks and automatic water tanks. No shade or shelter was provided. Heifers were allowed at least 12 inches (30 cm) of bunk space and 300 square feet of pen space per head, and fed a typical silage-based grower ration. The estimated average body condition score was 3.5 to 4 out of 5.

Historically, pregnancy rates averaged 85 to 95% in heifers at this facility. However, the producer reported only 30% of 238, 18-month old heifers were pregnant following 90 days of natural exposure to six Holstein bulls (three to four years of age). No synchronization program was utilized. Ovaries were palpated at the time of pregnancy examination and found to be normal for cycling heifers. Bulls had passed a breeding soundness examination prior to the beginning of the breeding season.

An aborted fetus found in the pen was submitted to the Kansas State University Veterinary Diagnostic Laboratory (KSU-VDL). The fetus was negative for *Brucella*, *Campylobacter*, *Leptospira*, BVD, IBR and other viruses. The fetus was not tested for *Ureaplasma* or *Mycoplasma*. Necropsy tissues submitted for histopathology showed no evidence of infectious disease.

Vaginal examination of a subset of open heifers (n=20) revealed vaginitis with a reddened vulva with small blister-like lesions, consistent with clinical signs associated with *U. diversum* infection.² Vaginal swabs were collected from 12 non-pregnant heifers with vaginitis, and submitted to the KSU-VDL. Five of the 12 vaginal swabs were polymerase chain reaction (PCR)-positive for *U. diversum*. No other bacterial pathogens were identified from the vaginal swabs. Additionally, blood samples were taken from heifers in the subset population; no viral pathogens were isolated, and no abnormal serologic results were found.

The Holstein bulls used to breed the dairy heifers were removed after 90 days' exposure and subsequently housed in a pen with the owner's beef bulls used to breed his commercial beef cows and heifers. Preputial swabs

were taken from eight beef bulls and four of the six dairy bulls and submitted to the KSU-VDL for *Ureaplasma* PCR testing. The two dairy bulls not tested for *Ureaplasma* were culled from the herd due to age. Testing for *Trichomonas* and *Campylobacter* isolation was not requested. Ear-notch biopsies were collected and sent to the KSU-VDL for immunohistochemistry (IHC) testing to determine if any of the bulls were persistently infected with bovine viral diarrhea virus (BVDV). All twelve of the bulls PCR tested were positive for *U. diversum*. All ear-notch biopsies were IHC-negative for BVDV. The bulls did not show any clinical signs of illness throughout the period.

Treatment and Outcome

Bulls and dairy heifers were separated and fed a silage-based ration *ad libitum* in concrete fence-lined bunks. The ration was top-dressed with chlortetracycline (CTC) to provide 350 mg/head/day for 28 days. After 28 days of feeding CTC, preputial swabs were collected again and 11 of 12 bulls tested positive for *Ureaplasma* a second time. The four dairy bulls were reintroduced to the open dairy heifers. Heifers were palpated for pregnancy 90 days after the bulls were reintroduced, and 238 heifers (95%) were pregnant.

Due to the high cost of replacement beef bulls, the *Ureaplasma*-positive beef bulls were used to breed the 285 commercial beef cows and heifers. When the cows and heifers were palpated for pregnancy in the fall, 282 (98.9%) were pregnant.

Conclusions

U. diversum is naturally carried by cattle in the reproductive tract. It can be an opportunistic pathogen leading to decreased conception rates, abortions and vaginitis. Unnatural or higher exposure rates to pathogens occur when cattle are placed in confinement. In this case study we found that daily feeding of 350 mg of CTC per head to bulls for 28 days did not effectively eliminate *U. diversum* carrier status.

Utilizing *Ureaplasma*-positive beef bulls did not negatively affect conception rates in the beef cow herd. It is difficult to know if the beef cows were immune to *U. diversum* due to prior exposure, or if the rate of exposure on pasture is lower than in confinement operations.

References

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Abstracts

Getting Cows Served on Time

Watson C.

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Effectively monitoring fertility performance is the basis for deciding what fertility policies are needed and to monitor their success when applied. Probably the most important parameter to determine is how many pregnancies are being produced in a period of time. Using the number of cows pregnant at 100 days post calving is an excellent independent assessment of fertility performance that not only takes account of the reproductive efficiency of the herd but also how long it takes on average to start serving cows - the first service interval. Using this monitor to assess performance that

not only takes account of the reproductive efficiency of the herd but also how long it takes on average to start serving cows- the first service interval. Using this monitor to assess performance an example herd is described using a synchronization system – “Intercept” (Intervet UK) – to replace heat detection for first service interval to 62 days and delivered significant economic benefits to the herd with over 50% of cows becoming pregnant by 100 days post calving. The practical system for achieving this and the results of using it are shown along with the economics benefits produced.

Analysis of Reproductive Performance, Milk Production and Survival Following Surgery for a Left Displaced Abomasum in Dairy Cattle

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The objective of this study was to evaluate the effect of on-farm surgical correction of left displacement of the abomasums (sLDA) on reproductive performance, milk production and survival. 100 cows diagnosed with left displacement of the abomasums (LDA) between 1st January 2002 and 30th June 2004 were matched with 100 cows that had not had an LDA (control group) based on herd, calving date and age group (heifer or cow). Data was collected using a combination of clinical and Interherd™ records at Lambert, Leonard and May, a large farm animal veterinary practice in Cheshire. Data recorded included lactation number, calving date, days

from calving to first insemination, days from calving to conception, 305-day milk yield and number of days from calving to exit from the herd (if applicable). Both days from calving to first insemination and days from calving to compared to the controls. sLDA group by 20 days ($p < 0.001$) and 40 days ($p < 0.01$) respectively, when compared to the controls. sLDA had no effect on 305-day milk yield or the long-term survival of cows in the herd. However, the number of sLDAs exiting the herd was more pronounced in the first 80 days after surgical treatment, after which it matched that of control cows.