

and year after year. The herd also had 3 milk cows which were milked by the owner and had a history of circular pox-like lesions on their teats.

Materials and Methods

Diagnostic tests performed by the referring veterinarian included viral isolation, culture, and infectious bovine rhinotracheitis (IBR) serology. Most of the results from these tests were negative except for parapoxvirus isolation from 4 samples and 1 *Ureaplasma* positive from culture. Upon our involvement in 2015, examinations were performed looking at teats and vaginas of 26 cows, and penises of 3 bulls. Three bull penises and 10 cow vaginas were swabbed and placed in viral transport media for viral isolation, aerobic and anaerobic culture, PCR for (IBR, herpes viruses, pseudocowpox virus), *Ureaplasma*, and *Mycoplasma* cultures. Blood samples were taken from 16 cows, 1 calf, and 3 bulls for pseudocowpox serology. In 2016 testing was performed both pre-breeding season and 3 weeks into the breeding season once lesions started to develop in the bulls. Swabs were taken for viral isolation, *Ureaplasma/Mycoplasma* cultures, and pseudocowpox virus PCR. Blood samples were taken for pseudocowpox virus serology and trace mineral evaluation.

Results

The 2015 post-breeding season examinations and testing resulted in 3 of 3 bulls having penile lesions or healing lesions; 11 of 26 cows having healing vaginal lesions; and 1 positive viral isolation of pseudocowpox virus from 13 cows

and bulls tested. Two positive *Ureaplasma* cultures resulted from 6 cows and bulls tested. One positive pseudocowpox PCR resulted from 13 cows and bulls tested (the positive sample was from the same bull that had the viral isolation-positive result). PCR results for herpes virus and IBR specifically were negative from 8 cows tested. Pseudocowpox serology resulted in 20 positive samples from 20 samples taken. The 2016 pre-breeding season examination and testing results were: 0 of 43 animals had lesions; 6 of 12 samples were positive for *Mycoplasma* cultures; 4 of 12 samples were positive for *Ureaplasma* culture; and 41 of 43 samples were positive for pseudocowpox virus serology. Twelve of 12 cows and bulls tested deficient in serum copper levels. Breeding season examinations revealed ulcerative penile lesions in 8 of 10 bulls, and vaginal lesions in 5 of 12 cows examined. Viral isolation swabs and pseudocowpox virus PCR are still pending. All breeding season testing is still pending.

Significance

The testing of this herd over the last 4 years has revealed that exposure to pseudocowpox is widespread in this herd. *Ureaplasma* and *Mycoplasma* are also present, however, these bacteria are thought to be normal surface inhabitants of the male and female reproductive tract with occasional secondary pathological infections. The herd is deficient in copper, which has been associated with immune dysfunction. There is 1 other reported case of a bull with ulcerative penile lesions thought to be associated with pseudocowpox. It is possible that this is an emerging disease or a disease that has been underreported.

Using a deterministic systems model to examine the effects of the postpartum period on cow-calf productivity over 10 years

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Introduction

The duration of postpartum anestrus is important to consider for reproductive momentum and efficiency in cow-calf operations. It is challenging to fully understand the long-term impacts that the average duration of postpartum anestrus has on production. We developed a deterministic model of cow-calf production over 10 years using the software program Stella Professional to model the effects that

various postpartum anestrus lengths have on measures of herd productivity, including the percent of cows pregnant at pregnancy diagnosis and the pounds of calf weaned per cow exposed.

Materials and Methods

For all model herds, eligible heifers were bred to a single artificial insemination followed by natural service exposure

for 42 days, with cows modeled to have a 63-day natural service breeding season. The breeding of heifers and cows was initiated simultaneously each model year. The initial herd populated for all models included 160 heifers and 840 cows. The age of puberty for heifers was assumed to be 365 days, the pregnancy risk per 21-day estrous cycle was assumed to be 65%, and the pregnancy risk for artificial insemination following estrous synchronization was assumed to be 60%. Pregnancy diagnosis occurred 90 days following the end of the cow breeding season, and calves were weaned 205 days after the start of cows calving. The post-partum periods examined for cows were 50, 60, 70, and 80 days, with the post-partum periods for heifers being set to 80, 90, and 100 days, resulting in 12 model herds being included in the analysis.

Results

The average percent pregnant at pregnancy diagnosis differed between model herds. Herds modeled with a 50-day cow post-partum period and 80-, 90-, and 100-day heifer post-partum periods had average pregnancy percentages of 91.82%, 90.66%, and 88.70%, respectively. Herds with a 60-day cow post-partum period had average pregnancy percentages of 90.03%, 88.69%, and 86.48% for 80-, 90-, and 100-day heifer post-partum periods, respectively. Herds with a 70-day cow post-partum period had average pregnancy percentages of 84.92%, 83.11%, and 80.28% for 80-, 90-, and 100-day heifer post-partum periods, respectively. Herds with an 80-day post-partum period and 80-, 90-, and 100-day heifer post-partum periods had average pregnancy percentages of 77.27%, 74.87%, and 71.77%, respectively. The average lb of calf weaned per cow exposed for herds with

a 50-day cow post-partum period and 80-, 90-, and 100-day heifer post-partum was 347.6, 341.2, and 331.8 lb (158, 155, and 150.8 kg)/cow, respectively. Herds with a 60-day cow post-partum period had an average lb of calf weaned per cow exposed of 336.3, 328.8, and 317.9 lb (152.8, 149.4, and 144.5 kg)/cow for herds with heifer post-partum periods of 80-, 90-, and 100-days, respectively. The average lb of calf weaned per cow exposed for herds with a 70-day cow post-partum period and 80-, 90-, and 100-day heifer post-partum was 308.7, 298.9, and 285.2 lb (154.3, 135.8, and 129.6 kg)/cow, respectively. The average lb of calf weaned per cow exposed for herds with an 80-day cow post-partum period and 80-, 90-, and 100-day heifer post-partum was 274.5, 262.4, and 248.2 lb (124.7, 120, and 112.8 kg)/cow, respectively.

Significance

The 10-year model of cow-calf production we developed adequately models cow-calf production as commonly practiced in the Midwestern and Great Plains regions of the United States. The duration of post-partum anestrus has a dramatic impact on measures of herd productivity, including the percent pregnant at pregnancy diagnosis and the pounds of calf weaned per cow exposed, when holding other production factors constant. Our model indicates that increasing post-partum periods of cows and heifers leads to reductions in the percent of cows pregnant at pregnancy diagnosis and the pounds of calf weaned per cow exposed. Based on our results, veterinarians and producers should consider determining the average post-partum period of herds and should use the average post-partum period of a herd to help make management decisions.

Comparison of treatment history and antimicrobial sensitivity results of common bovine respiratory disease bacterial pathogens from cases submitted to the ISU-VDL from 2013-2015

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Introduction

Summarized susceptibility results from diagnostic laboratory cases are often used to evaluate trends in antibiotic resistance. The objective of this retrospective study was to evaluate summarized antimicrobial susceptibility data from bovine respiratory disease cases submitted to the Iowa State

University Veterinary Diagnostic Laboratory in the context of reported antibiotic treatment history.

Materials and Methods

Diagnostic records from case submissions to the ISU-VDL from January 1, 2013, through December 2, 2015 were