

Materials and Methods

Data were collected from CanWest DHI for all cows with a milk PAG assay between January 1 and May 31, 2013. The PAG milk assay result is reported as a relative PAG concentration (S-N value). Cows that tested pregnant (PAG > 0.25 according to the manufacturer's cut-point; 6,196 cows in 967 herds) were included in this analysis. A dichotomous outcome of calving between 270 and 290 d after the relevant insemination was determined for each cow, with 5,139 successful outcomes. There was a significant interaction between days in gestation (DIG) at the time of the PAG assay and PAG level, so the data were stratified by DIG.

Results

Milk PAG concentrations increased after breeding, decreased at 45-75 DIG, then increased through the remainder of gestation. For cows tested ≤ 45 DIG ($n=793$), increasing PAG concentration was associated with an increased likeli-

hood of calving ($P=0.01$). For cows >45 and ≤ 5 DIG ($n=1,653$) relative PAG concentration ($P=0.001$) and linear somatic cell count score ($P=0.01$) were negatively associated with successful calving, while test-day milk yield was positively associated with the outcome ($P=0.01$). For cows >75 DIG ($n=3,750$) relative PAG concentration ($P=0.001$), and milk yield ($P=0.005$) were positively associated with full-term pregnancy; linear score was negatively associated with the outcome ($P=0.05$).

Significance

These results indicate that while higher PAG concentrations are positively associated with a positive calving outcome in general, a decrease in PAG concentration around 45 to 75 days in gestation was associated with a successful pregnancy outcome. We recommend that veterinarians working with herds using this technology be cautious of interpreting results for cows between 45 and 75 DIG, as PAG levels reach a nadir and therefore pregnant cows may test below the cut-point.

Associations between management practices and reproductive performance in Canadian dairy herds

J. Denis-Robichaud, DMV, MSc¹; **R.L.A. Cerri**, DVM, PhD²; **A. Jones-Bitton**, DVM, PhD¹; **S.J. LeBlanc**, DVM, DVSc¹

¹Department of Population Medicine, University of Guelph, Guelph, Ontario N1G 2W1, Canada

²Faculty of Land and Food Systems, University of British Columbia, Vancouver, B.C., V6T 1Z4, Canada

Introduction

Many options are available to dairy producers for managing reproduction in their herds. Reproductive performance varies greatly among farms, but the reasons for this are not well described. The objective of this study was to identify management practices associated with reproductive performance on Canadian dairy farms.

Materials and Methods

A bilingual questionnaire was distributed online (FluidSurveys, Ottawa, Canada) and by mail to Canadian dairy farmers between March and May 2014 to assess producers' attitudes and management practices regarding reproduction. Among other data, respondents were asked to give the percentage of artificial inseminations (AI) performed on the basis of visual heat detection, a timed AI (TAI) program, or automated activity monitoring (AAM), for first and subsequent AI separately. The main management practice was defined as the practice used for > 50% of AI, or "combined" if

no 1 practice was used for > 50% of AI. Pregnancy rate (PR), and insemination rate (IR) per 21 days, and conception risk (CR) for lactating cows in 2013 were extracted from dairy herd information (DHI) files. Univariable linear regression models adjusted for geographical region were used to identify associations of farms' characteristics and management practices with these reproduction performance measures.

Results

Of approximately 9,000 possible respondents, 833 surveys were completed (response rate: 9%), and of these, 346 farms gave access to their DHI files. Fifty-three percent (428/814) of respondents were satisfied with their herd's reproductive performance, and 90% (739/820) agreed that there was significant potential profit in increasing their herd's pregnancy rate. Thirty-seven percent (305/815) of respondents did not think there had been any decline in the fertility of their herd in the last 10 years, but 66% (496/753) reported that reproduction was 1 of the 3 main difficulties or challenges encountered by their business. Eighty-four

percent (690/820) of respondents preferred to inseminate on observation of strong signs of heat, but 45% (365/820) indicated that they found it difficult to detect cows in heat. The average (\pm SD) PR, IR, and CR were $17 \pm 5\%$, $43 \pm 11\%$, and $40 \pm 9\%$, respectively. Pregnancy rate was lower ($P < 0.05$) in tie-stall barns (15.2%, 95% CI=14.4-16.0%) than in free stalls (17.9%, 95% CI=17.2-18.6%), in herds inseminating once per day (15.7%, 95% CI=14.9-16.6%) than in herds inseminating twice per day (17.8%, 95% CI=16.8-18.7%), and in herds with < 100 lactating cows (16.2%, 95% CI=15.5-16.8%) than in herds with more than 250 lactating cows (20.1%, 95% CI=17.2-22.9%). Pregnancy rates were not significantly different by main reproduction management practice: visual heat detection (15.9%, 95% CI=15.0-16.8%), TAI (16.7%, 95% CI=15.4-18.0%), AAM (17.4%, 95% CI=16.0-18.9%), or combined practices (18.2%, 95% CI=16.6-19.9%). Insemination rate was lower in herds using visual heat detection (40.0%, 95% CI=37.3-42.6%) than in herds using TAI (47.4%, 95% CI=43.8-50.9%), or combined practices (46.7%, 95% CI=42.6-50.7%), but was not significantly different from herds using AAM (44.0%, 95% CI=40.3-47.7%). Conception risks were numerically lower in herds using TAI (36.8%, 95%

CI=33.0-40.3%) than in herds using visual heat detection (40.7%, 95% CI=37.2-44.1%), AAM (40.0%, 95% CI=36.1-43.9%), or combined practices (39.8%, 95% CI=35.8-43.9%), but not significantly different. Producers' attitudes regarding reproduction or management practices were not associated with herd reproductive performance.

Significance

Contrary to our hypothesis, dairy herd owners' attitudes and sentiments toward reproductive performance and management (as measured in this questionnaire) were not associated with their herd's pregnancy rate. Larger free-stall herds, on average, had higher pregnancy rates than smaller and tie-stall herds, but reproductive performance did not differ significantly among the main methods used to manage insemination. Therefore, we speculate that pregnancy rate may be more influenced by factors other than the main management practice they used, such as the effectiveness or consistency of implementation of chosen management techniques within a herd.

Accuracy and intensity of estrus detection with activity monitoring systems for lactating dairy cows

C. Leroy, BSc; S. LeBlanc, DVM, DVSc

Population Medicine, University of Guelph, Guelph, Ontario, N1G2W1, Canada

Introduction

Activity monitors are becoming a widely used tool for estrus detection in dairy cows. The objective of this study was to assess the intensity and accuracy of estrus detection with automated activity monitoring systems.

Materials and Methods

Three commercial dairy farms with an activity monitoring system (Heatime, SCR Inc, or Afi PedoPlus, Afikim) used for essentially all inseminations between 50 and 80 days-in-milk (DIM) were enrolled in this observational study. Herds were visited once weekly. Blood samples were collected at weeks 5, 7, and 9 postpartum and from a subset of cows on the day of insemination, to measure serum progesterone concentration. Cows were examined at week 5 for purulent vaginal discharge (PVD). Lameness and body condition were scored at week 7. Cows were classified as anovular if all 3 blood samples from weeks 5, 7, and 9 had progesterone < 1 ng/ml.

Results

Overall, 6.7% of cows were anovular (range of 3.6% to 8.2% among farms). Of these cows, 39% had a lameness score of 3 or above (1 to 5 scale) and 29% had PVD. Among cows that reached 80 DIM ($n=419$), 14% had not been inseminated by 80 DIM; of these, 12% were anovular, 23% were lame, 21% had PVD, and 4% had a BCS of < 2.5 . Among 352 blood samples taken on the day of insemination, 212 were signaled by the activity system and 140 by Ovsynch; 8% and 3%, respectively, had progesterone > 1 ng/ml, i.e. the cows were not in estrus.

Significance

In this sample, the accuracy of detection of estrus by automated activity monitors was high, but a subset of cows would likely require intervention for timely first AI and only a fraction of these were truly not cyclic.