Prevalence of postpartum hyperketonemia, endometritis, and prolonged anovulation in dairy herds and their association with poor reproductive performance at first service

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Introduction

Postpartum hyperketonemia, endometritis, and prolonged anovulation are known risk factors for poor reproductive performance at first service at the cow level. However, it remains unclear what the acceptable prevalence of these conditions is at the herd level. The objective of this study was to quantify the prevalence of these conditions in dairy herds and to determine the optimal prevalence thresholds associated with poor reproductive performance at first service at the herd level.

Materials and Methods

A total of 100 Holstein dairy herds from the province of Québec (Canada) were conveniently enrolled in this observational study. Herds were visited every other week and a total of 15 cows/herd were randomly selected and followed from parturition until 200 days in milk (DIM). Hyperketonemia was defined as having blood β-hydroxybutyrate ≥ 1.4 mmol/L using the Precision Xtra meter at 1 to 14 DIM, endometritis was defined as having mucopurulent or purulent vaginal discharge using the Metricheck device at 30 to 43 DIM, prolonged anovulation was defined as having serum progesteronemia < 1ng/mL using the Immulite laboratory technique at both 37 (±7) and 51 (±7) DIM, and success at first service was defined as pregnancy diagnosed by transrectal palpation 33 to 46 days after breeding. Statistical analyses were performed using logistic regression models in SAS.

Results

Herd-level median prevalence of hyperketonemia, endometritis, prolonged anovulation, and success to first service were 22%, 25%, 35%, and 30%, respectively. Poor success at first service was defined as pregnancy confirmation<30%. Optimal disease prevalence thresholds for predicting herd-level poor success at first service were ≥20% for hyperketonemia ($P<0.01$), ≥20% for endometritis ($P<0.01$), and ≥30% for prolonged anovulation ($P<0.01$).

Significance

These results demonstrate the high prevalence of postpartum hyperketonemia, endometritis, and prolonged anovulation in this population of dairy herds. They also show that herd-level thresholds can be used to identify herds with poor success at first service. Overall, these findings highlight the potential usefulness of herd-level disease prevalence for helping farmers and veterinarians improve dairy herd management.

Pregnancy outcomes based on milk pregnancy-associated glycoprotein levels

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Introduction

Timely diagnosis of pregnancy and pregnancy losses is economically important. A commercially available pregnancy-associated glycoprotein (PAG) milk assay (IDEXX Laboratories, Inc.) is offered through routine Dairy Herd Improvement (DHI) testing for diagnosis of pregnancy. The objective of this observational study was to describe the relationship between PAG at various stages of gestation and the likelihood of successful calving. The hypothesis was that higher PAG levels would be associated with successful calving.

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 likelihood 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

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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