

# Pregnancy loss attributable to mastitis in primiparous Holstein cows: a matched case-control study

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## Introduction

Several observational studies have produced different levels of strength of evidence indicating that mastitis can be a predisposing factor for pregnancy loss (PL) in dairy cows. In some of those studies, clinical mastitis before or after AI, subclinical mastitis before AI, and clinical mastitis during early lactation in combination with low BCS increased the risk of subsequent PL. Some studies, however, failed to identify a relationship between PL and clinical or subclinical mastitis after AI in dairy cows. To our knowledge, no studies have simultaneously examined the relationships between PL and exposures to clinical, subclinical, or clinical and subclinical mastitis during different exposure periods (for instance, before breeding and during gestation) in dairy cows. The objective of the study reported here was to examine the association between PL and previous exposure to clinical or subclinical mastitis before breeding or during gestation in primiparous Holstein cows.

## Materials and Methods

Records of primiparous Holstein cows that were declared pregnant on day 33 after AI from one dairy were used. The investigation was designed as a case-control study, where cows matched by calving-to-conception interval ( $\pm 3$  days). Cases ( $n = 79$ ) were cows diagnosed as non-pregnant by rectal palpation on day 47 or 75 post AI. Controls ( $n = 609$ ) were cows confirmed as pregnant by rectal palpation on days 47 and 75 post AI. Cows were assigned into one of four exposure groups of mastitis (not affected with mastitis;

affected with subclinical mastitis (DHIA SCS  $> 4.5$ ); affected with clinical mastitis; or affected with both clinical and subclinical mastitis) during two exposure periods: 1 to 42 days before breeding, and during gestation (1 to PL diagnosis day for cases, and 1 to 75 days for controls). Conditional logistic regression was used to model the odds of PL as a function of previous exposure to mastitis in study cows.

## Results

The odds of PL were 2.9 times greater in cows affected with clinical mastitis during gestation, compared to cows not affected with mastitis during the same period (OR = 2.90; 95% CI = 1.15, 7.29;  $P = 0.02$ ), controlling for lameness and breeding type (AI, embryo transfer). In that mode, however, PL did not associate with subclinical mastitis ( $P = 0.65$ ). On the other hand, clinical or subclinical mastitis before breeding was not associated with PL ( $P \geq 0.20$ ). In addition, the odds of PL were higher in cows affected with lameness 1 to 42 days before breeding, controlling for mastitis and breeding type, a new finding in the literature.

## Significance

Study results confirm two previous observational studies indicating that clinical mastitis during pregnancy can increase the risk of PL in dairy cows, and highlight the risk of PL as a function of lameness before breeding.