By Hossein Jamali, Hélène Poirier, and Simon Dufour

A CASE OF DÉJÀ -VU

Frustrated by a case of mastitis that keeps coming back again and again?

Clinical mastitis tends to recur many times in some cows during the same lactation. It is hard to know if you are dealing with a repeated infection that has not healed properly or a new episode that has nothing to do with the previous one, but could still be due to the same pathogen.

Dr. Simon Dufour, Université de Montréal, is a director of the Canadian Bovine Mastitis and Milk Quality Research Network. He and his team have studied the subject over the past year. Dufour's research project on pathogens and cow characteristics associated with recurrent clinical mastitis began with an extensive literature review of more than 1,600 scientific article abstracts. His research team narrowed their search to 63 scientific articles with the help of trainee Ève-Marie Lavallée-Bourget. The researchers were then able to determine the risk of clinical mastitis recurrence during the same lactation based on data from 14 of those studies.

"Although many articles offered some data about the number of cows experiencing one, two or three cases of mastitis during a single lactation, we have found few studies investigated specifically the risk of clinical mastitis recurrence. Establishing whether this risk increases or decreases with the number of cases is of great interest and could help make treatments more effective," said Dufour.

What are the chances a cow with previous mastitis would be infected again? Would the risk of developing clinical mastitis decrease compared with a cow that was never infected? Would the cow be more susceptible to infection if she had clinical mastitis before? Nine of the 14 studies conducted in America, Europe and Scandinavian countries seem to support the second hypothesis as shown in *Figure 1*. Unfortunately, cows experiencing mastitis are probably not immunized against the disease. On the contrary, they seem to be more susceptible after the first onset of infection. The researchers re-analyzed the aggregate results from the 14 studies using a method known as meta-analysis. When pooling the data, from 1,334,395 lactations, the researchers concluded the risk of clinical mastitis is roughly the same or just slightly higher in cows that have already had a first onset of mastitis during lactation compared with cows that have not.

The results of this first phase of the project were presented at the 54th annual meeting of the National Mastitis Council (NMC), held in early February 2015. A second phase is underway. The project will help determine the causes of these repetitive cases of clinical mastitis and measure their economic impact. PhD candidate Hossein Jamali, Université de Montréal, was able to identify the direct financial

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losses resulting from repetitive cases, including discarded milk, treatment costs and mortality. Indirect costs, such as reduced milk production and increased culling rates, were also scrutinized. Negative impacts on cow fertility have also been reported following repeated cases of clinical mastitis. The results will be documented in another article.

The key message is preventing the onset of the first case of mastitis, according to Dufour and his team. Prevention must specifically target the dry-off period, especially for mature cows, as well as the calving period and beginning of lactation, all critical periods.

"With clinical mastitis, there is possibly a cumulative effect. After a first onset of clinical mastitis, cows are possibly becoming more susceptible. This disease really appears to elude our cows' immune systems," says Dufour.

In the coming months, the researchers will investigate risk factors that could explain why mastitis occurs more than once during the same lactation. They want to develop a model to predict the probability of repeated infection in cows to assist producers in their herd management decisions.

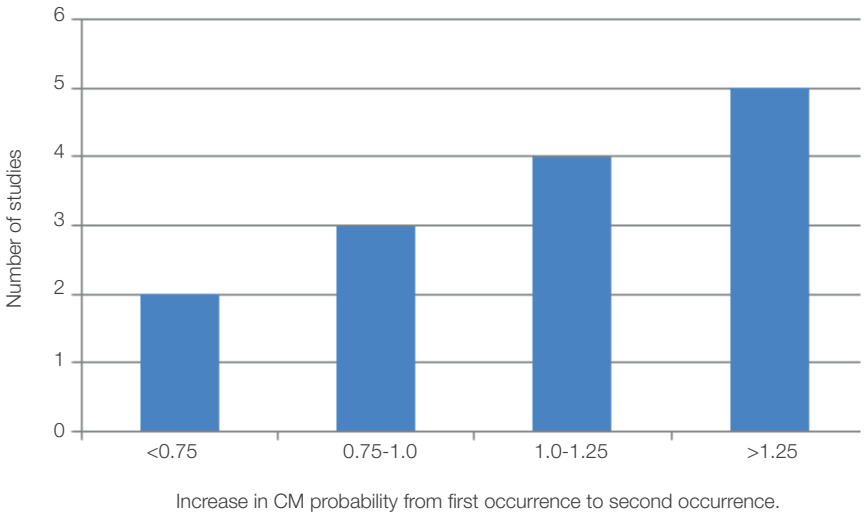

FIGURE 1. Histogram of the risk of clinical mastitis (CM) for cows having already experienced a CM event in the current lactation compared with healthy cows. Data from 14 studies. Values above 1.0 indicate increasing risk of CM following a first case. Values below 1.0 indicate decreasing risk of CM after an initial case.

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