Effective and economic Johne's disease control using new early disease detection assays

Larissa Martins[1,2], Jeroen De Buck[1], Herman W. Barkema[1]

[1]Department of Production Animal Health, Faculty of Veterinary Medicine, University of Calgary. [2]larissa.martins@ucalgary.ca

Johne's disease (JD) is an infectious chronic enteritis characterized by diarrhea, loss of body condition, and lower productivity. A potential association between *Mycobacterium avium ssp.* paratuberculosis (MAP) and Crohn's disease, a chronic enteritis of humans, is also reported. New experiments demonstrated that young calves also shed MAP, on average, one MAP-infected calf infects, ~3 non-infected pen mates. However, there is no research that evaluated the economic effects of a Johne's disease control program based on the transmission of MAP in calves. We aim to: i) design an improved JD control program, including prevention of calf-to-calf transmission; ii) determine accuracy of new technologies for early detection of MAP-infected dairy cows; and iii) model economic impacts of the new control program. The new JD control program will be implemented on 10 Alberta dairy farms based on a previous risk assessment to determine difficulties in JD control. Blood samples to detect the interferon-gamma (IF-gamma) response and fecal samples for PCR analysis will be collected every 2 mo from all female young stock (≤12 mo) and every 6 mo from all dairy cows to determine accuracy of biomarkers. Environmental sample analysis and IF-gamma response will be linked to management data to generate interventions. Analysis of actual MAP prevalence will enable us to validate the predictive value of actual infection status and to identify, separate and remove infected animals early in disease development. Results should be widely applicable as average herd size and housing system in Canada are similar to other countries. Take home messages: The new JD control program will prevent MAP infections and, as a consequence, reduce incidence and prevalence of other transmitted infections and improve health of young stock, as well as reduce economic losses due to MAP infections.