

Bovine Leukemia Virus control in dairy cows: Effect of selective removal of high-risk animals on herd prevalence

Sulav Shrestha^{1*}, Karin Orsel¹, Herman Barkema¹, Guido van Marle², Faizal Abdul Careem¹, Frank van der Meer¹

¹Faculty of Veterinary Medicine, ²Cumming School of Medicine, University of Calgary. *sulav.shrestha1@ucalgary.ca

Bovine leukosis is a highly transmissible viral disease affecting a large percentage of Canadian dairy cows. The causative retrovirus, bovine leukemia virus (BLV) incorporates its genomic material (RNA) as DNA into that of the host's DNA of the B-lymphocyte cells. This so-called provirus or proviral DNA enables the virus to establish a lifelong infection. BLV-infected animals can have different amounts of this proviral DNA and can be categorized as either high proviral load (HPL) or low proviral load (LPL) BLV-infected animals. HPL animals are more likely to develop leukocytosis, tumors. Moreover, these HPL cows are considered high-risk animals as they appear to more readily transmit the virus, probably due to a high percentage of infected B-lymphocytes. We propose a strategy whereby we will work with the dairy herds across Alberta to identify and remove these HPL animals from the herd. This intervention was proven effective in a recent study in three medium-sized (70-200 cows) dairy herds in the USA. We hypothesize that this intervention significantly reduces BLV transmission to non-infected cows. As the standard methods of proviral load quantification (qPCR) are expensive, we are evaluating alternative, more affordable ways of HPL detection such as antibody titers, white blood cells and B-lymphocytes counts. Removing all infected animals from a high BLV prevalence farm is not practical. We propose a system that identifies high-risk animals, and advise only to remove this subset of BLV-infected animals from the herd. This selective culling of HPL animals is expected to significantly speed up the reduction of BLV prevalence in a dairy herd and be a major step towards eradication of BLV. We are recruiting dairy farms in Alberta that want to participate in our effort to eradicate BLV from dairy herds. If you are interested to know more about the project please contact sulav.shrestha1@ucalgary.ca / (403) 708-2342.