

# Persistent Infection of Ovine Herpesvirus Type 2 in a Dairy Herd

Robert J. Callan, DVM, PhD<sup>1</sup>; Dave C. Van Metre, DVM<sup>1</sup>; Jenny G Powers, DVM<sup>1</sup>; Cameo Carbone<sup>1</sup>; Jane Carman<sup>1</sup>; R. Page Dinsmore, DVM<sup>1</sup>; Hong Li, DVM PhD<sup>2</sup>; James K. Collins, DVM, PhD<sup>3</sup>

<sup>1</sup>Colorado State University, Fort Collins, CO 80523

<sup>2</sup>Animal Disease Research Unit, USDA-ARS, Washington State University, Pullman, WA

<sup>3</sup>University of Arizona, Tucson, AZ

## Introduction

Malignant catarrhal fever (MCF) is a frequently fatal viral disease of cattle and other ruminants. Sheep-associated MCF is caused by ovine herpesvirus type 2 (OvHV-2). Over 95% of domestic sheep are asymptomatic carriers of OvHV-2 and serve as a source of infection for cattle. Previous studies demonstrated a significant high prevalence of asymptomatic OvHV-2 infection in adult dairy cattle from a herd housed in close proximity to sheep. While sheep are considered to be the primary source of infection in cattle, there are reports of MCF in cattle that are not in direct contact with sheep. The hypothesis for this study is that cattle infected with OvHV-2 can remain asymptomatic for extended periods of time and may transmit the virus to offspring through placenta and/or colostrum. The study's objectives were to monitor a group of adult cattle for evidence of OvHV-2 persistent infection and evaluate possible transmission of OvHV-2 to calves.

## Materials and Methods

OvHV-2 infection was monitored in 24 adult Holstein dairy cows over a period of 20 months. Blood, milk, nasal and ocular secretions were obtained at monthly intervals and tested for OvHV-2 DNA by polymerase chain reaction (PCR). Sera were tested for MCF viral antibody by competitive inhibition ELISA (CI-ELISA). In addition, 19 calves and their dams were randomly selected based on time of birth. Blood samples were obtained from calves immediately after birth prior to co-

lostrum ingestion, 48 hours post-calving, and weekly thereafter for 16 weeks. Blood and colostrum samples were also obtained from the dam at birth. Blood samples were tested by PCR and CI-ELISA. Milk samples were tested by PCR.

## Results and Conclusions

Of the 24 adult cattle, 9 animals (37%) were CI-ELISA positive, 5 of which were consistently detected by the assay during the study period.

OvHV-2 DNA was detected by PCR from peripheral leukocytes, milk, nasal secretions, and/or ocular secretions from 9 animals on either one or two occasions during the 20-month period. None of the animals developed clinical signs of MCF. In the calf study, 3 cows were CI-ELISA positive at birth. Pre-suckle samples from all 19 calves were negative by CI-ELISA or PCR. MCF viral antibody was detected in 7 calves at 48 hours after nursing with colostrum. None of the colostrum samples were OvHV-2 positive by PCR. The levels of MCF viral antibody in those 7 calves became undetectable between 6 and 12 weeks of age. None of the calves subsequently became CI-ELISA or PCR positive.

These results demonstrate that dairy cattle can become infected with OvHV-2 and not develop clinical disease over a period of at least 20 months. Viral DNA can be occasionally detected from multiple secretions. This study did not detect *in utero* transmission of OvHV-2. While calves may seroconvert to OvHV-2 following colostrum ingestion, there was no indication of OvHV-2 transmission during the milk feeding period.