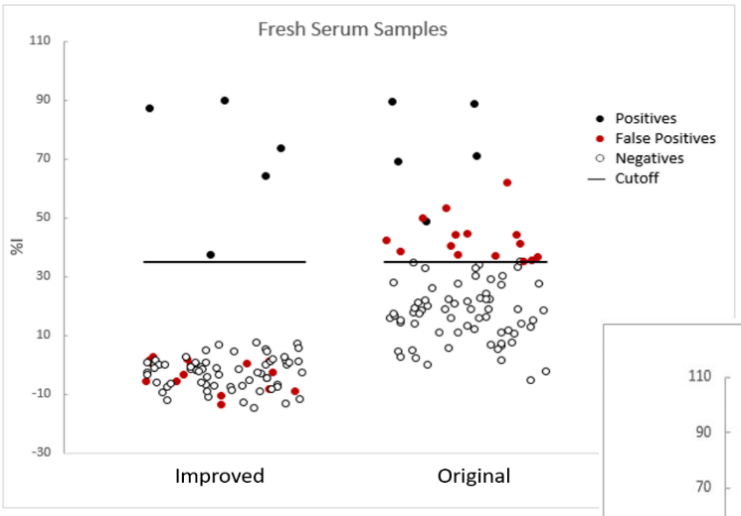
Improved SRLV diagnosis: resolution of a false positive concern in freshly collected samples

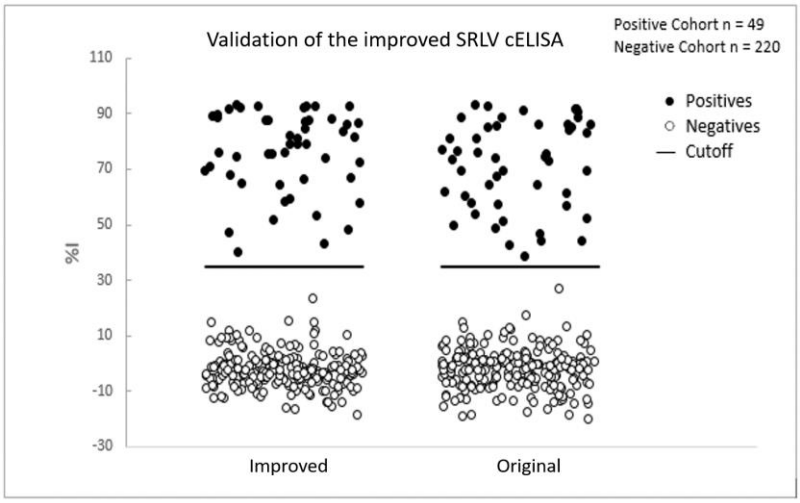
Caprine arthritis-encephalitis virus (CAEV) and ovine progressive pneumonia virus (OPPV) are small ruminant lentiviruses (SRLVs) that persistently infect goats and sheep, causing significant economic loss for producers. An integrative program of serological testing to identify infected animals coupled with appropriate management practices is pivotal for disease control efforts. VMRD's SRLV cELISA kit is a USDA licensed assay widely used to detect antibodies to CAEV and OPPV in goats and sheep with excellent sensitivity and specificity. This study investigated reports of occasional unexpected positives found in individual animals when samples were tested fresh. An improved version of the assay was optimized to accommodate for this sporadic issue without sacrificing sensitivity or specificity.

A large set of serum samples were collected from a goat herd and tested within 6 hours (considered "fresh samples") using the original SRLV cELISA kit. Aliquots from samples that returned positive results were heat inactivated at 56 C for 30 minutes, then run alongside the fresh samples to identify anomalous false positives. We then evaluated the samples in a new version of the SRLV cELISA.



Of the fresh sample set, 13 were identified as anomalous "false positives" in the original cELISA, with %I ranging from 35.6-50.7%. These **fresh samples no longer ran positive** in the improved kit, **however true positives continue to be positive**. Heat inactivation of the false positive reactor samples at 56C for 30 minutes suggests potential interference by a heat-labile component in the problematic samples such as complement and/or clotting factors.

The improved SRLV cELISA was validated using these fresh samples as a part of a 269 field sample set, which revealed **identical sensitivity and specificity** as compared to the original version. The only difference observed was in fresh samples previously identified as false positive.



The VMRD SRLV cELISA test has been a fundamental tool for the control of CAE and OPP for over a decade. It has a documented history of excellent performance, most recently demonstrated by its 100% accuracy in a ring trial performed by the Federal Research Institute for Animal Health in Germany. This targeted investigation enabled better characterization of a reported sample problem and optimization of the manufacturing process to address it. However, in isolated cases when samples were tested while fresh, it was found that an unidentified heat-labile factor could occasionally result in false positive results in the original assay. This was also consistent with previous anecdotal reports indicating that some animals with unexpected positive results had a recent history of vaccination or illness. If these anomalous positives were re-tested after storage, they tested negative, adding confusion to the scenario.

The improved SRLV cELISA resolves this false positive concern and accommodates for potentially problematic fresh samples, further enhancing test accuracy and CAE/OPP management efforts.

Written by Siddra Hines, DVM, PhD, DACVIM on behalf of VMRD