

**December 16, 2021, 10:00 am US Eastern**

**Rift Valley fever virus: A deadly zoonotic disease of ruminants and humans**

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Description: Rift Valley fever phlebovirus (RVFV), is a mosquito-borne, zoonotic pathogen in genus *Phlebovirus*, family *Phenuiviridae*, order *Bunyavirales* that typically causes outbreaks in Africa and spread to the Arabian Peninsula in 2000. It has a high colonization capacity, is a potential emergent risk in Europe, Asia and the Americas due to the presence of competent vectors and is a bioterrorism/agroterrorism concern as it could be weaponized. Consequently, it is classified as a category A pathogen by the National Institute of Allergy and Infectious Diseases in recognition of its potential for social disruption requiring significant public health preparedness and is the United States Department of Agriculture Animal and Plant Health Inspection Service's third most dangerous animal threat after avian influenza and foot-and-mouth disease. In the U.S. RVFV is a Select Agent. All work with virulent RVFV must be conducted minimally at biosafety level 3 enhanced.

The virus replicates in both *Aedes* spp. and *Culex* spp. mosquitoes including species native to non-endemic areas. In ruminants, particularly sheep, RVFV infections cause mass abortion and high mortality rates in neonates. Older animals can succumb to liver and kidney failure as well as hemorrhagic fever. Other ruminants, including cattle, goats, a diversity of African wild hoofstock, white-tailed deer, camels and alpacas are also susceptible to RVF. In humans, RVF ranges from flu-like symptoms to hemorrhagic fever, liver and/or kidney failure and can also include encephalitis and retinitis. Increased abortion risk has also been correlated with the presence of RVFV in humans.

Until recently, our understanding of Rift Valley fever pathology in ruminants has come from extant published case reports of natural disease and observations made during experimental animal studies, for which the primary focus was other than improving our understanding of Rift Valley fever (RVF) pathology. These reports are typically focused on a small number of animals and only a few organs, typically liver and lymphoid tissues. Furthermore, pathology information from experimental animal studies while informative has limited value as these studies cannot fully replicate natural disease in its virus format, dose or route of inoculation/exposure.

This talk will present insights regarding RVF pathogenesis in sheep gleaned from macro- and microscopic pathological examinations as well as viral antigen and nucleic acid distribution of Rift Valley fever virus in over 200 naturally infected South African sheep, lambs and fetuses including placenta. These findings will be compared with published information regarding RVF in humans. Additional, topics for discussion will be the importance of type and number of diagnostic samples to collect, limitations of current diagnostic tests and correlation of natural disease findings with those from experimental animal studies.

## Learning Objectives:

1. Describe Rift Valley fever virus, its epidemiology, importance and current countermeasures
2. Identify the key pathological findings in cases of Rift Valley fever (RVF) in ruminants and humans
3. Delve deeper into the disease expression in sheep (a natural host)
4. As time allows, review some advances in detection of RVF

## References:

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