

USAHA

Committee on Foreign and Emerging Diseases



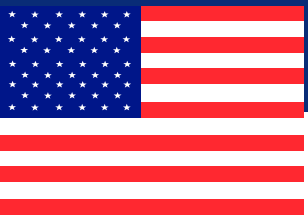
Schmallenberg Virus: NVSL response

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 October 2012



Safeguarding Animal Health





Schmallenberg Virus U.S. Response

- ✓ **Trade**
- ✓ **Information** – USDA/APHIS/VS
 - ✓ *Schmallenberg Virus Case Definition and Guidance*



Definition

Schmallenberg virus is the tentative name for an emerging, arboviral agent which initially can cause mild to moderate disease of fever, reduction in milk production, and diarrhea in adult ruminants. Fetuses can be infected if the dam is exposed during early pregnancy. Fetal infections can lead to abortions and birth defects.

Schmallenberg virus is not known to infect humans.



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SBV Case Definition

- Suspect case: susceptible species with clinical signs consistent with SBV
- Confirmed case: confirmation of viral infection in a suspect case by PCR, virus isolation or other method of SBV antigen detection.





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- ✓ **Information** – USDA/APHIS/VS
 - ✓ *Schmallenberg Virus Case Definition and Guidance*
 - ✓ *Schmallenberg Virus Guidance for U.S. Veterinary Diagnostic Laboratories*
- ✓ **Laboratory testing**
 - ✓ Surveillance of suspect cases (FADs)



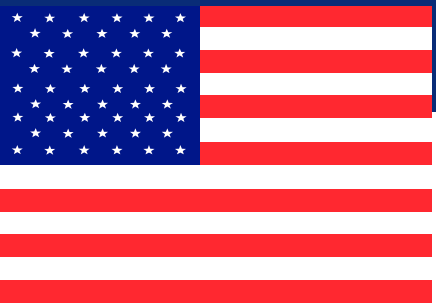
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SBV sample collection

- Live animals
 - EDTA blood
 - Serum
- Stillborn and malformed calves, lambs and kids:
 - From necropsy: Tissue samples of brain (cerebrum and cerebellum); additional samples: central nervous system, spleen and blood
 - From live newborn: blood, (preferably pre-colostral) serum and meconium
 - Placenta and amniotic fluids





Schmallenberg Virus Testing US Laboratory Capacity

- NVSL has obtained SBV agent, protocols and reagents for PCR testing from Germany.
- Have ability to conduct diagnostic tests (PCR, VI and VN) for Schmallenberg at NVSL (Ames and Plum Island).
- NVSL can accept samples to test for Schmallenberg; work with AVIC and SAHO.
- SBV sheep antiserum produced at NVSL, Ames.



SBV Laboratory Diagnosis

Identification of Schmallenberg virus

- Short viremia in experimentally infected calves (2-5 days)
- Virus can be detected in fetal samples

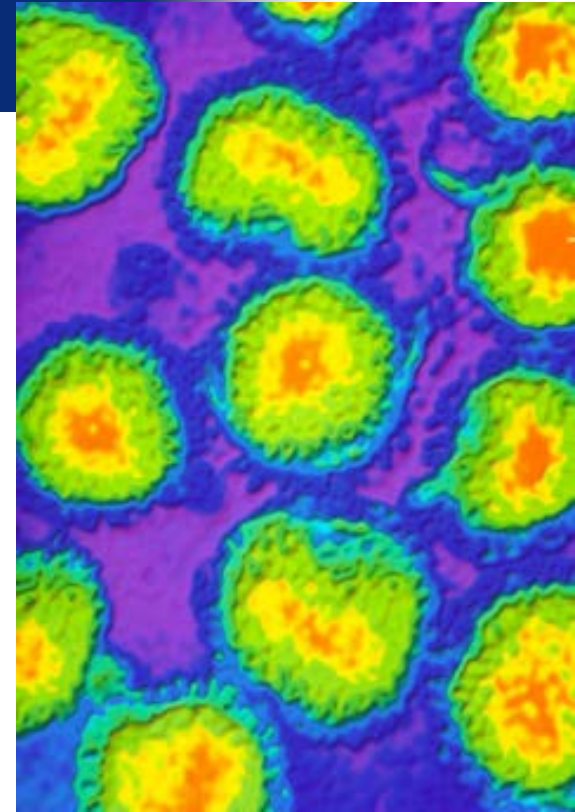
Laboratory Methods – virus/viral RNA

➤ Real-time RT-PCR

- ❖ Organs and blood of infected fetuses, placenta, amniotic fluid, meconium

➤ Cell culture isolation of the virus

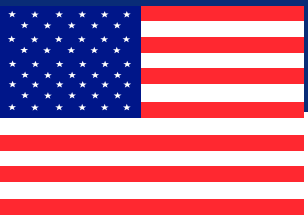
- ❖ Virus has been isolated from blood from affected adults and infected fetus and brain from infected fetus



Laboratory Diagnosis (*continued*)

Serology tests for SBV antibody

- Virus Neutralization test
 - ❖ Adult animals, dams of affected fetuses
 - ❖ Akabane and Cache Valley reference serum negative on SBV VN at NVSL -SBV VN appears to be **specific**
- Indirect fluorescent antibody (IFA)
- ELISA – commercial test from Europe



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 - ✓ *Schmallenberg Virus Case Definition and Guidance*
 - ✓ *Schmallenberg Virus Guidance for U.S. Veterinary Diagnostic Laboratories*
 - ✓ Shared information with Diagnostic Laboratories and SAHOs
- ✓ **Laboratory testing** acquired protocols and reference materials from FLI, Germany
 - ✓ Surveillance of suspect cases (FADs)
- ✓ **Vaccines**



Unanswered questions/current SBV research

- Analysis of the route of entry and incubation time
- Virus distribution in tissues of infected animals
- Virus shedding ?
- Persistence of the virus?
- Identification and refinement of best diagnostic tests
- Validation of diagnostic tests
 - ❖ Sensitivity for SBV?
 - ❖ Specificity – detection of related pathogens?
- What is the origin of SBV?
- Will Schmallenberg virus become endemic?
- What is the host range? Are there reservoirs for SBV?
- What are transmission-competent vectors for SBV?
- Are semen or embryos a risk for transmitting SBV?
- **Will Schmallenberg virus reach North America?**

Acknowledgements

- Martin Beer, Bernd Hoffmann, Mark Dauber and colleagues at the Friedrich Loeffler Institute, Germany
- Eileen Ostlund, USDA/APHIS/NVSL
- Peter Fernandez, USDA/APHIS/IS
- Schmallerberg virus websites in Germany, Belgium, the Netherlands, Italy, United Kingdom, France, etc.



Questions?



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