Schmallenberg virus
Technical and scientific studies, EC implementing decision 27 June 2012

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Schmallenberg virus Technical and scientific studies

Presentation outline

- **Pathogenesis**
  - Susceptible species
  - Organ distribution / pathology

- **Epidemiology**
  - Origin and spread
  - Characterization of the virus
  - Vectors

- **Diagnosis**
  - Detection in semen and embryos
  - Development and harmonisation of tests

- **Conclusion / Future perspectives**
Schmallenberg virus

Pathogenesis

- **Susceptible species**
  - Ruminants, mainly cattle and sheep
  - Other susceptible species: goat, deer species, moufflons, wild boar, camelids, mice, other.
  - Horses and pigs not susceptible.
  - Antibodies detected in many species

- **Organ distribution**
  - Multiple organs, blood and lymphoid tissues
  - Fetal membranes and placentomes

- **Pathology**
  - Infrequent Arthrogryposis Hydro-encephalopathy
Schmallenberg virus

Epidemiology

- **Origin and spread**
  - Origin /source still unknown
  - Spread throughout Europe and beyond
  - Seroprevalences decreasing in Europe 2012

- **Characterization of the virus**
  - Orthobunyavirus phylogeneticly related to Douglas and Sathuperi simbu viruses
  - Variabel region M-segment
  - Virulent cattle blood isolates
  - Atypical avirulent sheep brain isolates
Schmallenberg virus
Epidemiology (ctd)

- Vectors
  - Retrospective studies
    - Detections in various culicoides species
      \((C.\text{obsoletus, C.sensu stricto, C.scoticus, C.chiropterus, C.dewulfi})\)
    - High prevalences in 2011 (> 1%)
  - Prospective studies
    - SBV positives in 2012
    - Decreased prevalences (≤ 0.1%)
Schmallenberg virus
Diagnosis

- Detection in semen

<table>
<thead>
<tr>
<th>Country test lab</th>
<th>Tested</th>
<th>SBV RNA positives</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>seropositive</td>
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<tr>
<td></td>
<td></td>
<td>producing</td>
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<tr>
<td></td>
<td></td>
<td>bulls</td>
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<tr>
<td></td>
<td></td>
<td>batches %</td>
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<tr>
<td></td>
<td></td>
<td>seropositive</td>
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<tr>
<td></td>
<td></td>
<td>producing</td>
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<tr>
<td></td>
<td></td>
<td>bulls %</td>
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<tr>
<td>Germany</td>
<td>740</td>
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<tr>
<td>The Netherlands</td>
<td>55</td>
<td>8</td>
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<tr>
<td>France</td>
<td>940</td>
<td>160</td>
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<tr>
<td>Total</td>
<td>1735</td>
<td>262</td>
</tr>
</tbody>
</table>

- Development / harmonisation of tests
  - RT-PCR and Serologic tests established and harmonised
Schmallenberg virus Technical and scientific studies
Conclusion/ Future perspectives

- > 40 scientific publications, > 35 researchers
- Schmallenberg virus origin, characterization and source tracing
- Potential re-occurrence of SBV in Europe
- Contamination of semen
- Surveillance of emerging viruses and vectors
- Vector competence for Orthobunyaviruses