The Emergence of Schmallenberg Virus

Ian Davies

Head AHVLA Small Ruminants Expert Group
Introduction

- Emergence of SBV
- Surveillance
- Clinical disease and pathology
- Transmission and spread
- Current situation – GB and mainland Europe
Emergence of Schmallenberg virus

- GD Deventer (Holland) contacted AHVLA in early September 2011
- Diarrhoea, pyrexia, malaise in dairy cattle
- Had we seen it in GB?
- Cause at that stage not established
Emergence of SBV - continued

• **August – October 2011** - increase in reported cases of diarrhoea, fever and milk drop in adult dairy cows in **Netherlands** (120 farms mainly in East of country).

• **Germany** reported a similar syndrome in cattle (80 farms), although diarrhoea less prominent.

• **Late November** - suspect virus detected in blood samples from clinically affected cattle in **Germany**. Subsequently named Schmallenberg virus.

• **December onwards** - reporting of abnormalities present at birth. Mainly sheep, also cattle and goats in **Holland** and **Germany**.
Schmallenberg virus

- Related to Akabane virus (seen in Australia) also known to cause congenital malformations in ruminants
Enhanced Surveillance for SBV in GB

• Initiated by AHVLA and SAC
• Letters to PVSs and farming industry.

Clinical case definition:
• Immobile joints (arthrogryposis) or severe nervous signs (“dummy” signs), blindness or marked paresis / paralysis in a ruminant neonate or foetus
• For new born from ruminant dams imported from mainland Europe in 2011, any stillbirth, weakness or disease with nervous signs.
Detection of SBV in south-east England

10 January 2012 - PCR up and running at Weybridge on fresh tissues and blood.

23 January 2012 - the presence of Schmallenberg virus (SBV) was confirmed by PCR testing on four sheep farms in Norfolk, Suffolk and East Sussex.
Clinical Signs

- Newborn
- Adults
Clinical signs in newborn - arthrogryposis

- Non progressive
- Congenital contractures that develop before birth and are present at birth
- Reduced mobility of multiple joints
- May include rotation and abduction of limbs and twisting of spine: scoliosis (lateral), kyphosis (upward) and torticollis (torsion of the neck)
- Often muscle wastage due to neurotropic failure or denervation atrophy leading to muscle contracture and joint fixation
Twisted neck and spine. Immobile joints
Immobile joints, twisted neck
Parrot mouth / overshot jaw
Brain abnormalities
Narrowing of spinal cord
Signs of disease in adults

- Dairy cattle
  - Diarrhoea, Pyrexia, milk drop
  - Early embryonic death?
- Goats – Milk drop?
- Sheep
  - (None)
  - ? Increased return / barrens
  - Milking sheep?
- Cattle, Sheep and Goats – difficulties delivering malformed fetus
Diagnostic tests available

- Clinical sign and post mortem findings
- PCR – detects virus in tissues (brain) or blood
- Histopathology (examine stained tissues under the microscope)
- Antibody tests (commercial ELISA)
  - Maternal serum
  - Fetal fluids
  - Bulk milk
- Virus isolation
  - Virus isolated in Germany and used for experimental inoculation of calves. Virus was detectable in blood for 2-5 days
Transmission of SBV

• Biting insects (midges)

• Holland – Prevalence in *C. obsoletus* was 0.56% (Approx 10 X cw midges infected with BTV)
Regions at risk of midge incursion 2011

Greatest area put at risk in the UK on a single day between July and November 2011. (Note: plumes suitable for vector incursion occurred on less than 20% of days during this period)
Incidents in Sheep – April 2012

- Black: >30 cases
- Blue: 10-20 cases
- Red: 5-10 cases
- Green: <5 cases
Black >5 cases
Blue 2-4 cases
Red 1 case
Pink- Suspicious

Cattle by county
SBV – deformed offspring to Oct 012

Counties with any evidence of SBV infection, from submissions of deformed offspring.
Acute disease in cattle

Counties with any evidence of SBV infection, from acute infection, in dairy cattle.
SBV – Antibody Detection

Counties with any evidence of SBV infection, from antibody detection in sheep or cattle
SBV – serology, acute disease and malformations

Legend
- Counties with dairy cattle with acute SBV
- Counties with deformed offspring with SBV
- Counties with evidence of exposure to SBV in sheep
- Counties with evidence of exposure to SBV in cattle

Counties with any evidence of SBV infection, from acute infection, antibody detection or submissions of deformed offspring.
Regions reporting evidence of Schmallenberg infection in ruminants in the EU during 2011-2012
Current GB situation (14-01-13)

- Malformations confirmed in sheep (300 premises) and cattle (59 premises). 3 premises with affected calves and lambs
- Not confirmed in goats
- Acute disease in dairy cattle (23 premises from N Yorkshire, Cheshire, Midlands to Cornwall)
- Use of *B. melitensis* survey sera (sheep): Northumberland, N.Yorkshire, Shropshire, Carmarthenshire and Powys
## Confirmed Infection – North of England

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<th>COUNTY</th>
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Vaccine development

- Commercial vaccine developed and submitted for regulatory approval
- Hopefully available this year (2013)
Human health risk

- Risk of human infection highly unlikely
- No associated disease in humans on affected farms
- Current advice is normal sensible precautions as would be advised in a normal lambing season
Thanks + Questions