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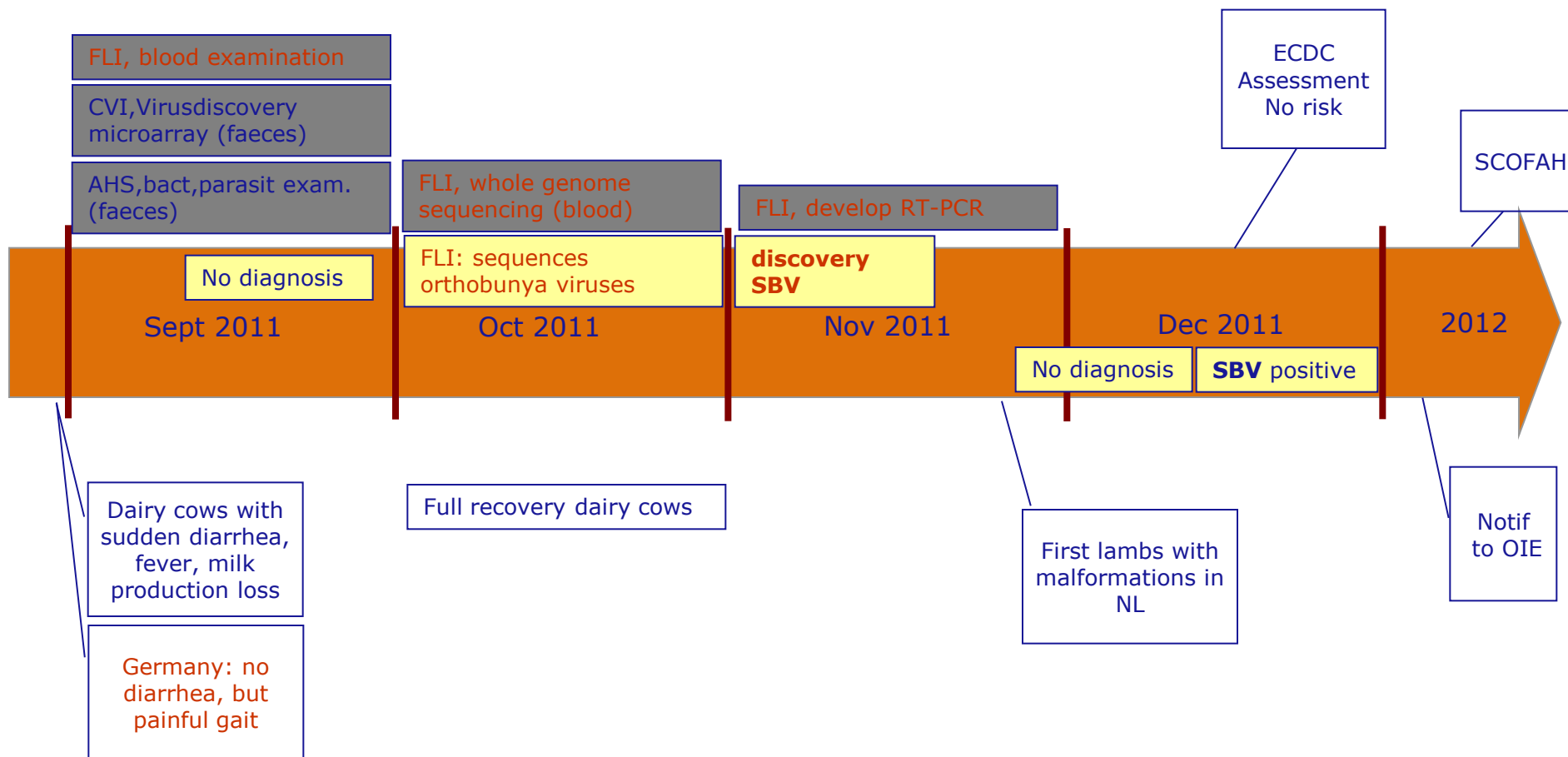
# Epidemiology of the "Schmallenberg" virus

Ana Afonso  
Animal Health and Welfare unit (AHAW)

## ***OUTLINE***

- ***Schmallenberg virus: an overview***
- ***EFSA mandate***
  - ***Epidemiological scenarios***
  - ***Data needs***
  - ***Data collection***
  - ***Analysis of epidemiological data***
  - ***Next steps***

# What and When



- Starting Dec 2011 there were 40 notifications at PROMED MAIL



- World Organization for Animal Health - all affected countries have reported



Emerging disease means a new infection resulting from the evolution or change of an existing pathogenic agent, a known infection spreading to a new geographic area or population, or a previously unrecognized pathogenic agent or disease diagnosed for the first time and which has a significant impact on animal or public health.

- Friedrich Loeffler Institut and Central Veterinary Institute
- European Commission and Member States
- European institutions: EC- DG SANCO, European Food Safety Authority, European Centre for Disease Prevention and Control, European Medicine Agency.



- **No evidence that the Schmallenberg virus could cause illness in humans** Preliminary assessment carried out by the European Centre for Disease Prevention and Control (ECDC) – **22 Dec 2011**
- To continue field **investigations and surveys** on this virus - Develop a **guidance** document on surveillance as a matter of urgency
- The Member States invited the Commission to identify possible ways to provide financial **support to the above investigations**

EFSA was asked to provide scientific and technical assistance on the possible risks for animal and public health caused by the "Schmallenberg" virus by the European Commission.

Several outputs were requested, the first one as an urgent response.

A preliminary analysis of the likely epidemiological scenarios –  
Guidance on data collection in Member States, **6 February**  
**2012**

1

An analysis of the epidemiological data already available, **31**  
**March 2012**, first report, followed by regular updates every two  
months.

2

A report on the overall assessment of the impact of SBV on  
animal health, animal production and animal welfare together  
with a characterisation of the pathogen, **31 May 2012**

3



- **"Schmallenberg" virus: likely epidemiological scenarios and data needs. EFSA 2012:EN-241. [31 pp.]. Available online:**

[www.efsa.europa.eu/publications](http://www.efsa.europa.eu/publications)

## *Summary of results*

- Overview of current knowledge and uncertainties
- Epidemiological situation in Member states
- Possible period for detection of further cases of malformed ruminant foetuses
- Likely epidemiological scenarios
- Disease spread modelling
- Data needs/data collection guidelines

## *SBV unknowns and working assumptions*

- SBV infection is the **cause** of the clinical syndromes reported. Its pathogenesis and transmission is similar to other virus of the same group, e.g. Akabane
- SBV **Infection status** of European ruminant population is unknown. The European ruminant population is susceptible.
- SBV like other Simbu serogroup virus is a **vector-borne infection**

## *Recommendations*

- It is recommended that **close monitoring of possible public health impact** is continued by ECDC and EFSA and the situation reassessed in light of any further scientific/epidemiological findings.
- In order to assess the impact and spread of SBV infection at EU level **surveillance data should be collected and shared** between Member states. This should include data from serological surveillance in areas where SBV has yet not been reported.

## *Case definition proposal*

### Foetuses and neonates

**Suspect case** : Arthrogryposis hydranencephaly syndrome (AHS) in ruminants (stillbirths, premature births, mummified fetuses, and dysfunctions or deformities of foetuses or liveborn neonates including arthrogryposis, hydranencephaly, ataxia, paralysed limbs, muscle atrophy, joint malformations, torticollis, kyphosis, scoliosis, behavioural abnormalities and blindness )

**Confirmed case** : Confirmation of viral infection by RT-PCR, Viral isolation or other method of pathogen detection

### Past Infection cases in dams

**Suspect case** : Ruminants with pregnancies resulting in AHS

**Confirmed case** : Confirmation of viral infection by ELISA or other method of indirect detection.

### Adult animals

**Confirmed case** : Confirmation of viral infection by RT-PCR, Viral isolation, ELISA or other method of pathogen or indirect detection.

# Output 1- Minimum dataset

**Reporting period:** August 2011 to the date of transmission of data

**Animal species:** Ruminants

**Unique herd identifier:** Anonymised, unique at country level

**Geography :** Country and region

**Time point:** Date of first suspicious report

**Risk factors:** production system and animal movements

**Herd/flock level statistics:** number animals, females of breeding age, pregnant, live births, still births, abortions, dystocia, ahs cases, acute symptoms, deaths, animals tested, animals positive

Pilot for XML Data Submission

## Access the Data Collection Framework (DCF)

The DCF is a secure web portal which supports the submission and validation of datasets transmitted to EFSA for use in risk assessment

- Reporting officers from 21 MS and 2 EFTA (NO and SW)

**Table 1:** Data submission by Member States

	<i>Date of accepted submission</i>	<i>Submission of herd level dataset (Y/N)</i>	<i>Submission of animal level data set (Y/N)</i>	<i>Submission of data on suspect cases (Y/N)</i>	<i>Submission of data on confirmed cases (Y/N)</i>	<i>Submission of data on number of tested offspring (Y/N)</i>
<b>Belgium</b>	2012-03-21	Y	N	N	Y	N
<b>France</b>	2012-03-27	Y	N	Y	Y	unknown
<b>Germany</b>	2012-03-27	Y	N	N	Y	N
<b>Italy</b>	2012-03-20	Y	Y	Y	Y	Y
<b>Luxembourg</b>	2012-03-27	Y	N	N	Y	N
<b>Netherlands</b>	2012-03-28	Y	N	N	Y	N
<b>Spain</b>	2012-03-27	Y	Y	N	Y	N
<b>United Kingdom</b>	2012-03-26	Y	N	N	Y	N

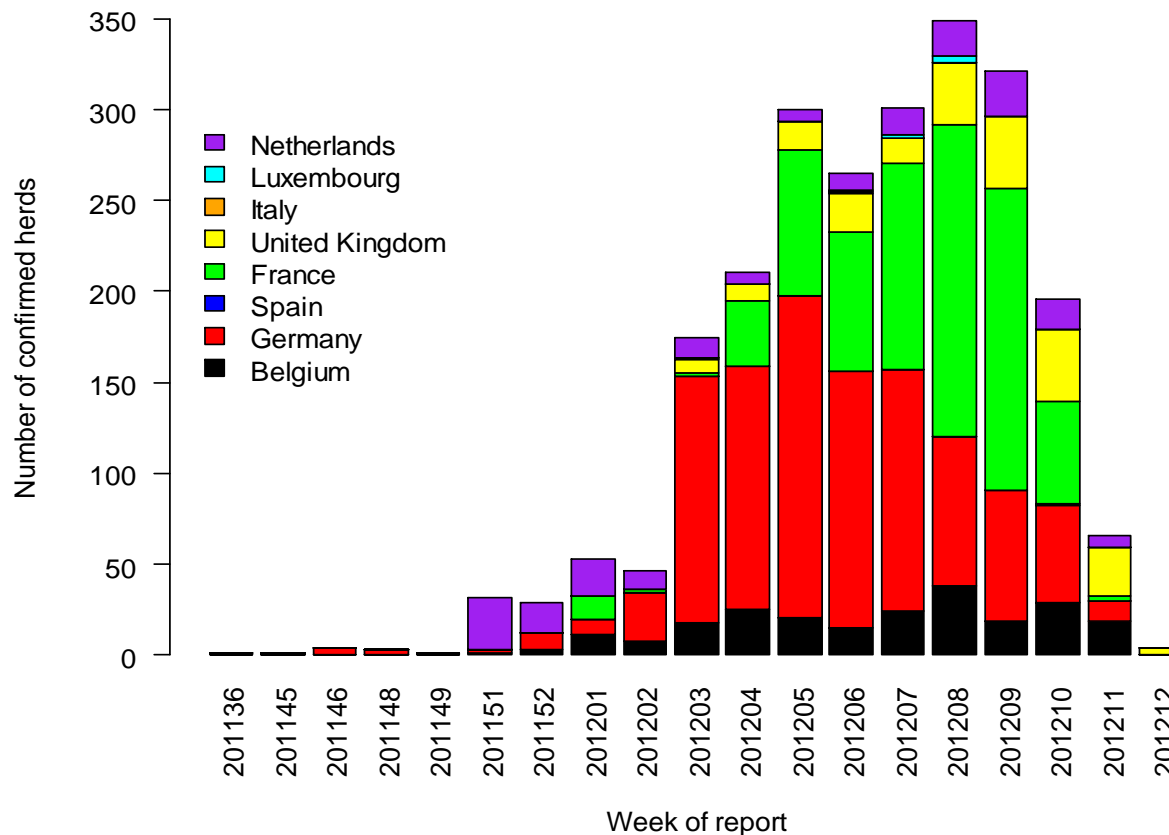
***All Member States with infected herds reported data to EFSA***



# Output 2 – Affected herds

	Confirmed Herds	RT PCR Neonates	RT PCR Adults	Serology Adults
Bison	1	1		
Sheep	1910	1910		75
Goats	56	56		4
Cattle	393	383	8	52
<b>Total</b>	<b>2360</b>	<b>2350</b>	<b>8</b>	<b>131</b>

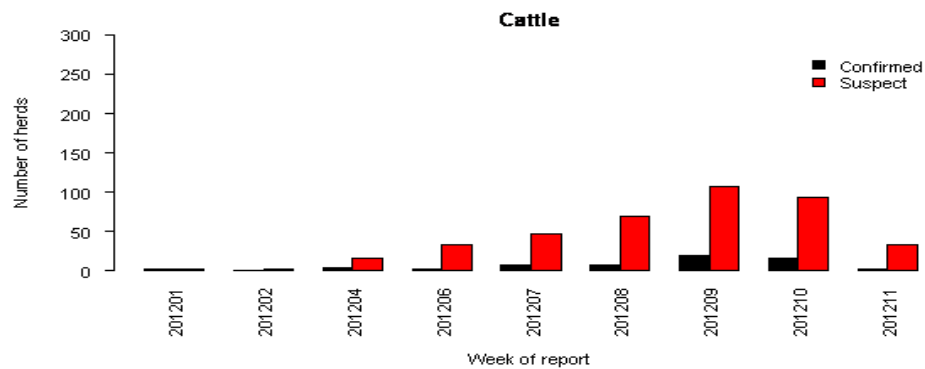
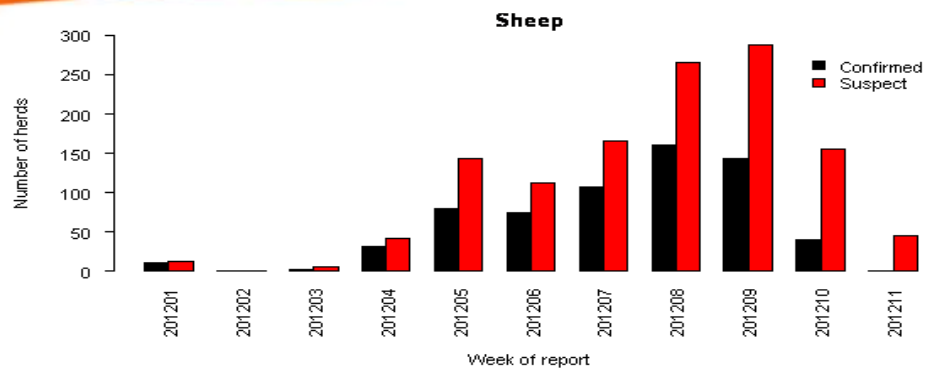
# Output 2 -Temporal Spread



Confirmed herds by week of first report and country- All species

- All Member States have reported the number of **confirmed herds** following viral detection by PCR or serological confirmation, 2 MS have reported the number of suspect herds.
- The number of **confirmed cases by PCR** can constitute an underestimation of the number of infected herds, in particular for calves.
- The number of confirmed acute **cases in adults** with viral detection by PCR is limited to eight cases in Germany, most likely corresponding to infection during the period of viral circulation in summer/autumn 2011.

# Output 2 - Confirmed? Suspect?



## Concerns

- Under reporting
- Passive surveillance
- Test validation

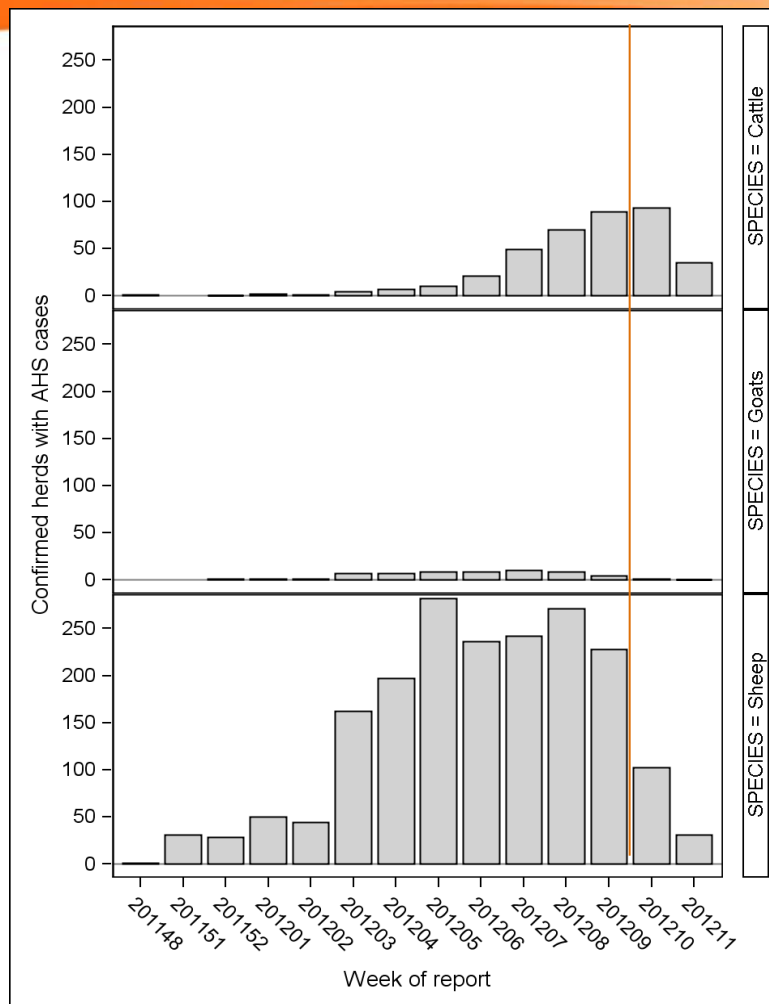
# Output 1 -Possible detection of AHS

<b>Animal species</b>	<b>Infection April 2011</b>	<b>Infection August 2011</b>	<b>Infection October 2011</b>
<b>Lambs</b>	August 2011	December 2011	February 2012
<b>Calves</b>	November 2011	March 2012	May 2012
<b>Goat kids</b>	August 2011	December 2011	February 2012

Considering an average gestation period of 150 days in sheep and goats and 280 days in cows

It could be expected that the majority of the deformed lambs would be born from December to February and the majority of deformed calves after March

# Output 2 - Temporal Spread



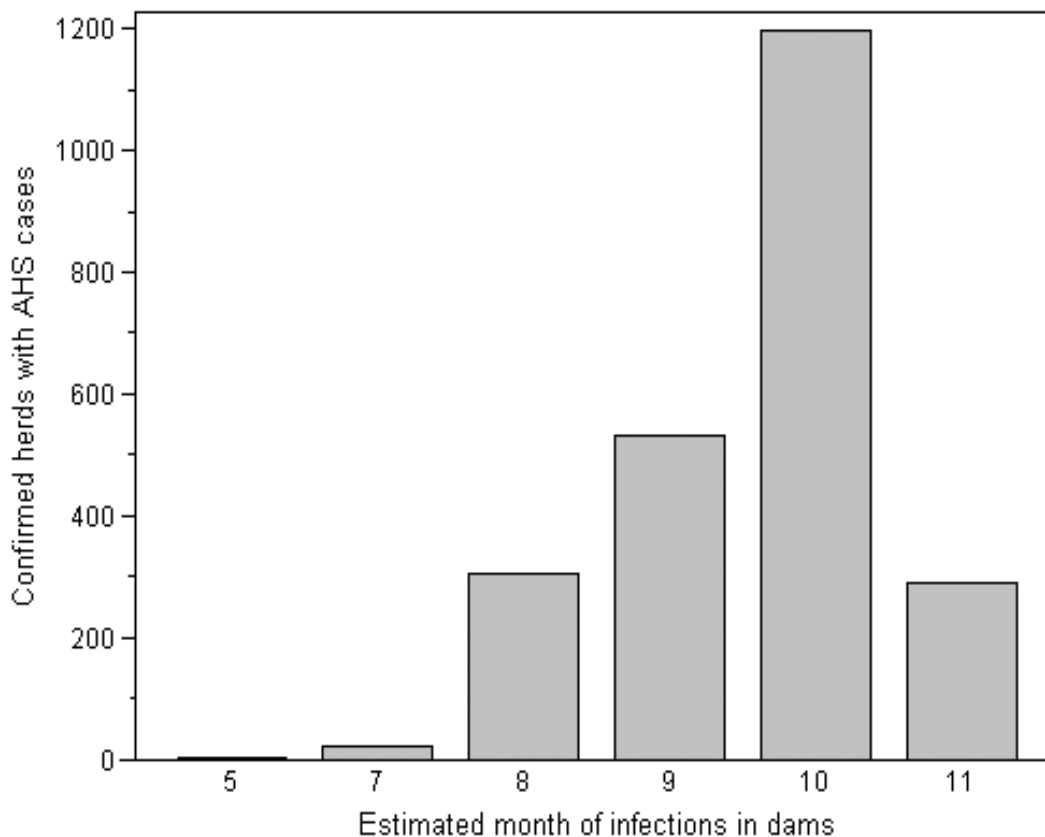
Cattle

Goats

Sheep

Confirmed herds with AHS cases by week of first report and species

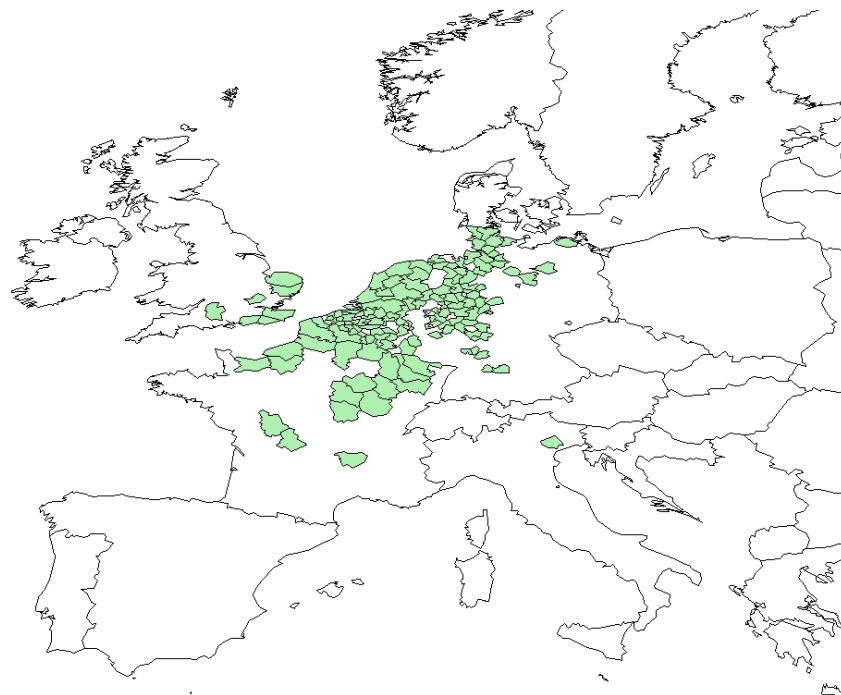
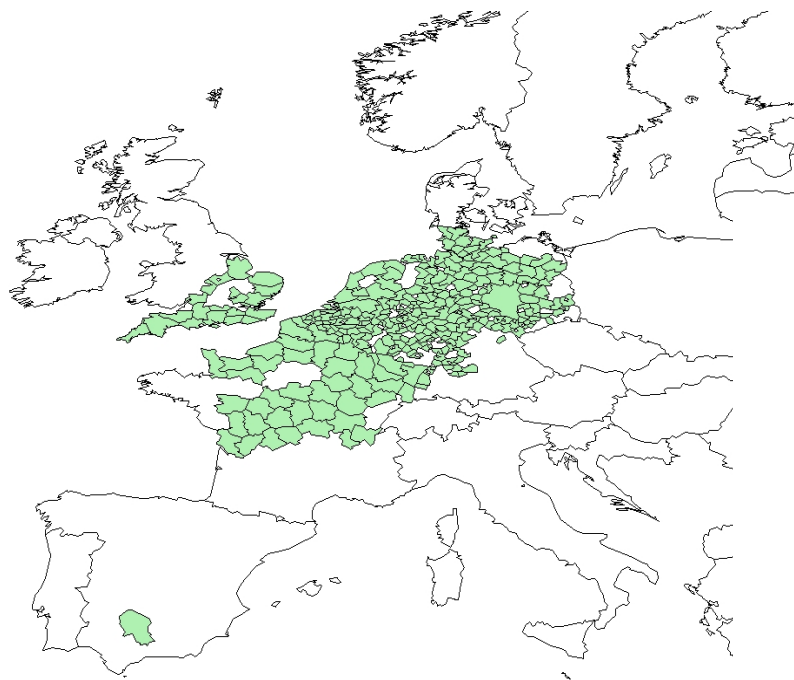
# Output 2 -Temporal Spread



- Estimation of months of viral circulation including all species and countries, with adjustment for gestation period and vulnerable stage

# Output 2 - Geographic distribution

## Regions with at least one SBV confirmed herd



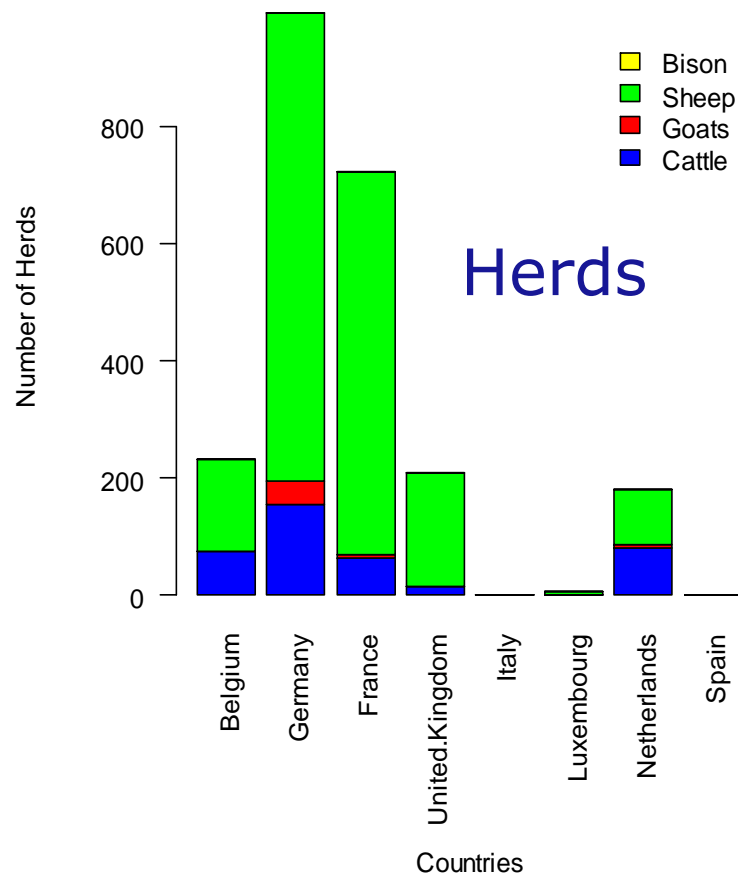
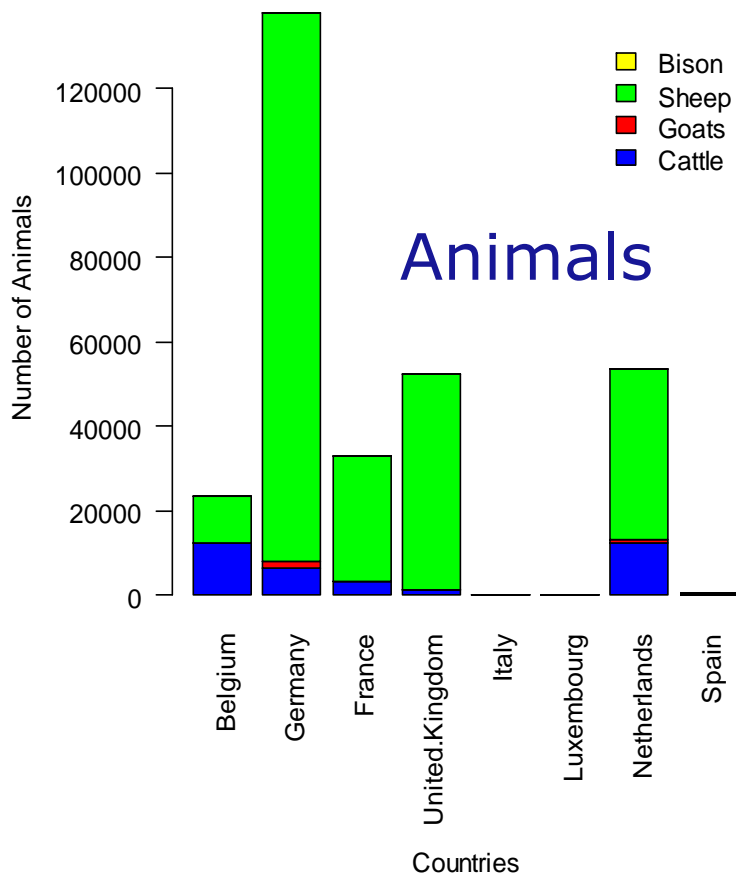
- Sheep herds

- Cattle herds



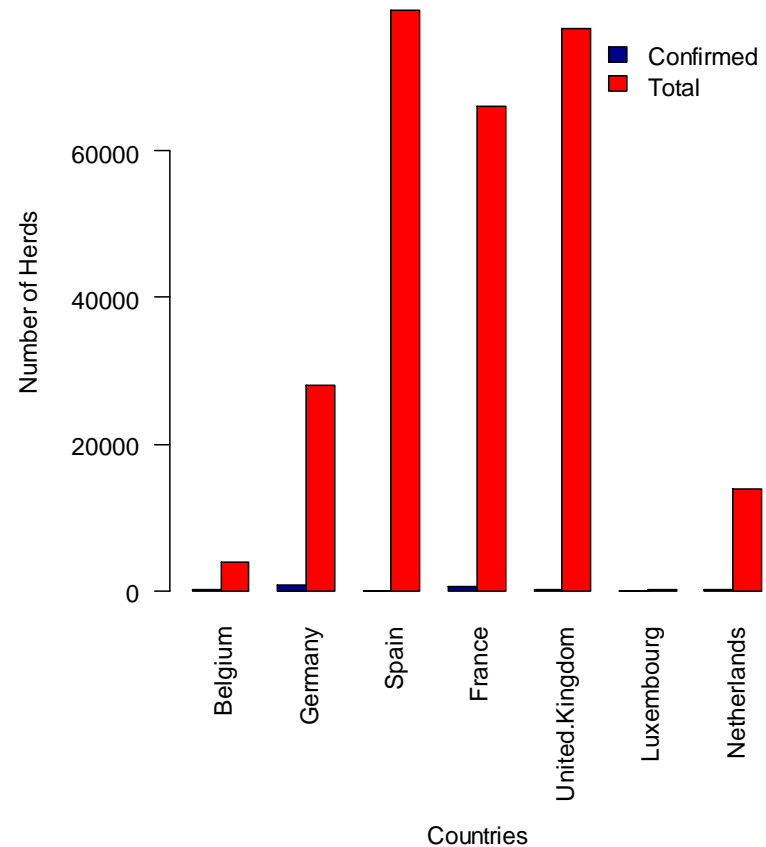
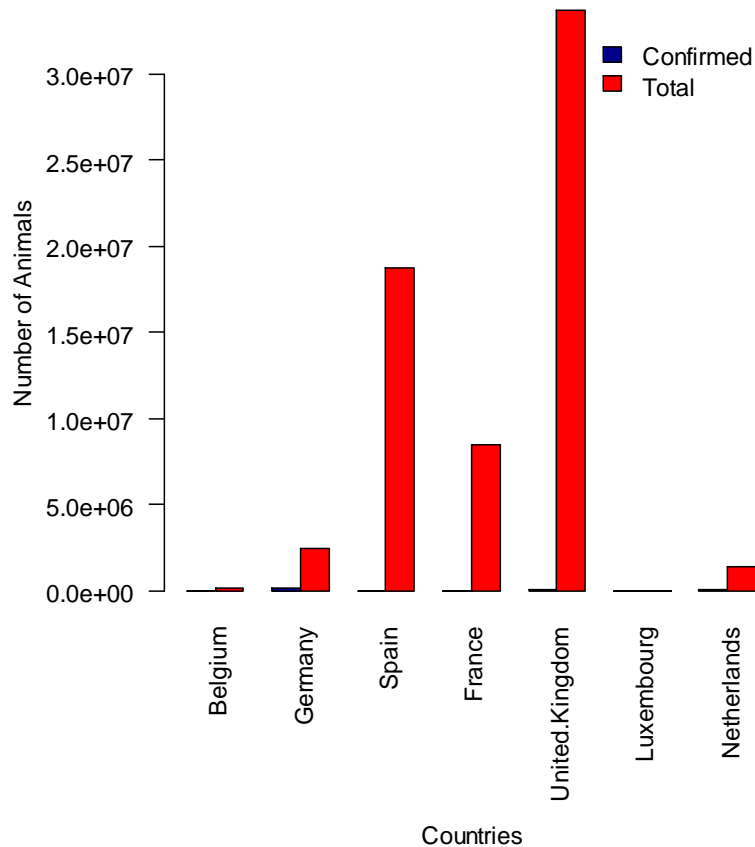
- For the purpose of this report, impact was defined as mortality and morbidity in the affected animal populations, the proportion of cases in the populations.

# Output 2 – Total number of animals in confirmed herds



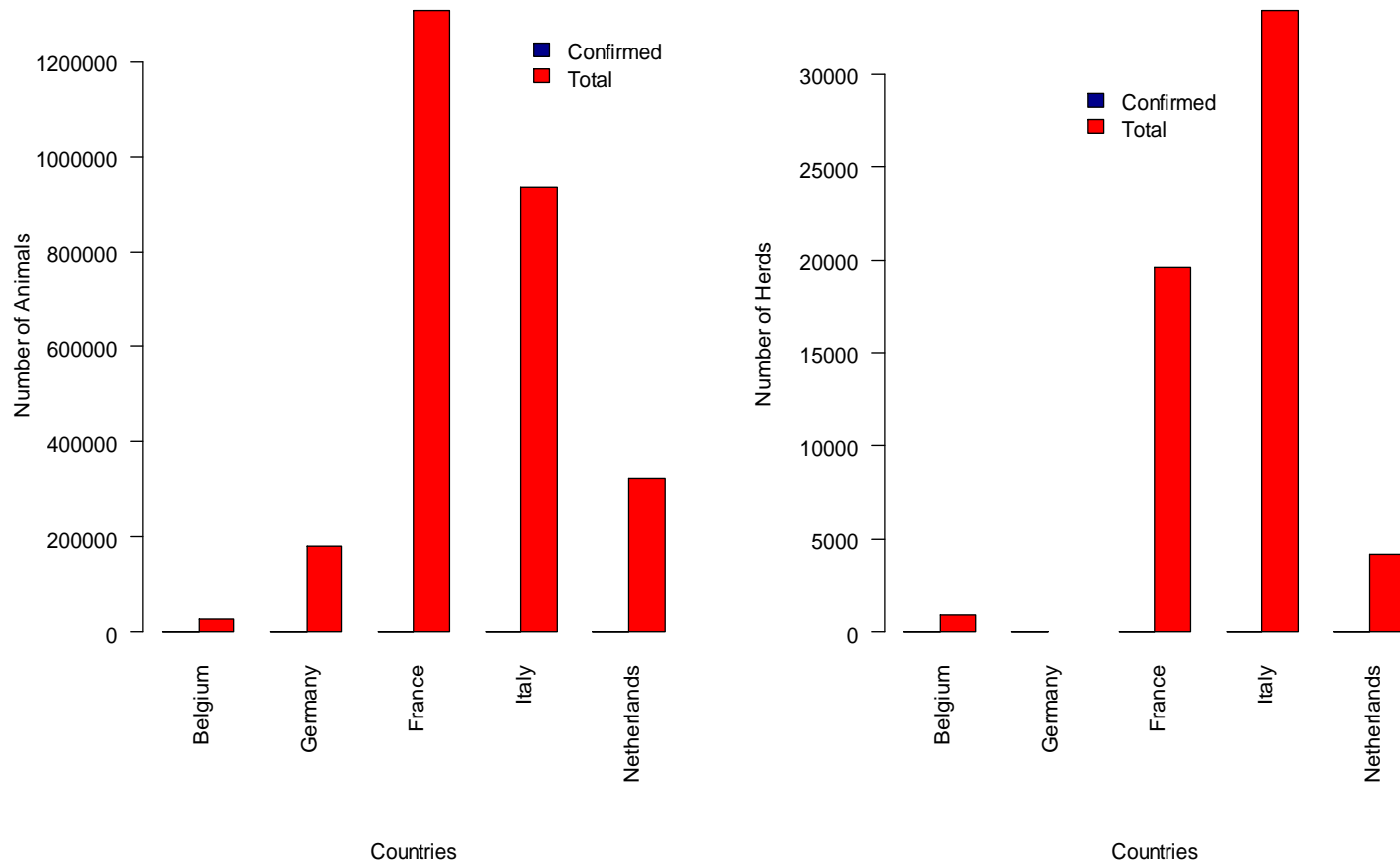
Total number of animals in SBV confirmed herds(left panel) and SBV confirmed herds (right panel) by country and species.

# Output 2 – Impact- Sheep



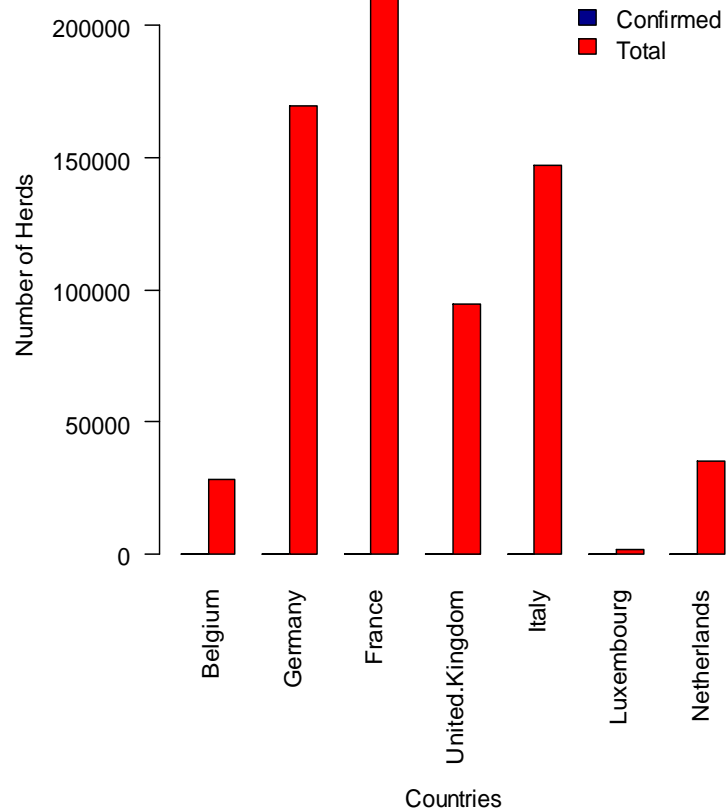
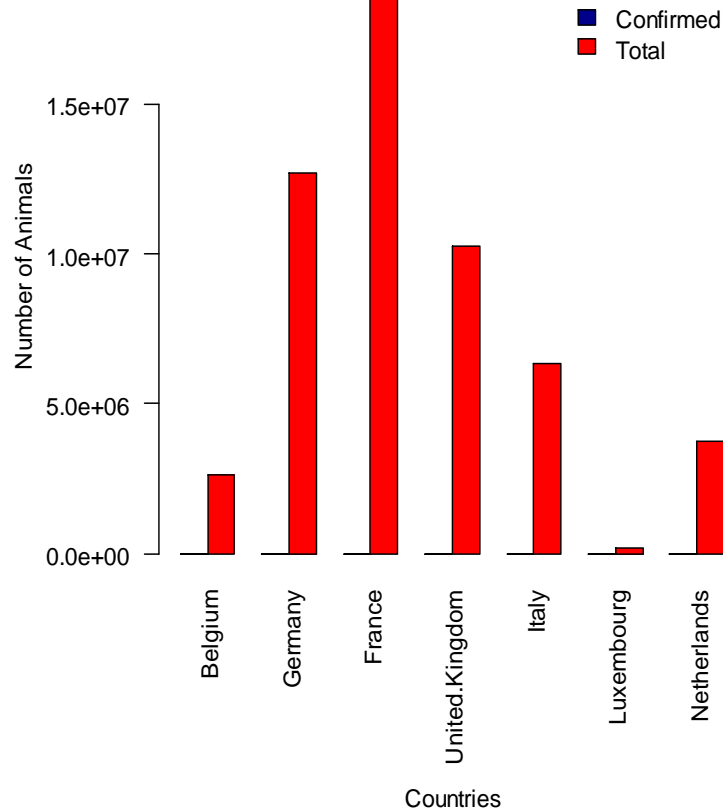
Total number of sheep in SBV confirmed herds (left panel) and SBV confirmed herds (right panel) by country versus total number of sheep and herds per country.

# Output 2 – Impact- Goats



Total number of goats in SBV confirmed herds (left panel) and SBV confirmed herds (right panel) by country versus total number of goats and herds per country.

# Output 2 – Impact - Cattle



Total number of cattle in SBV confirmed herds (left panel) and SBV confirmed herds (right panel) by country versus total number of cattle and herds per country.

Next reporting deadline 16/4/2012

- Confirmed/suspect/number tested
- Impact measures
- Extended data set



The modeling of the **hypothetical SBV spread** was done using a model developed for **BTV 8** and assuming that the EU ruminant population is **susceptible**.

## Why?

- BTV8 is primarily a vector-borne disease
- BTV8 and SBV are circulating in the ruminant population
- Information is available regarding BTV8 in Europe whereas there has only been one case report for viruses of the Simbu serogroup in Europe
- No information on the prevalence of infection in the EU

*More information is needed on:*

- ✓ **Serodiagnostic** tests to detect past exposure to SBV in animal populations in Member States
- ✓ Evaluation of **immunity status**, including an assessment of whether adult animals exposed to infection develop a strong and **long-lasting immunity** to SBV
- ✓ **Transmission routes**, including improved estimates of **viraemia duration**, **vector competency** and vertical transmission in vectors, as well as direct and transplacental transmission in ruminant hosts



## EFSA

- Regular updates of epidemiological situation
- Report on the overall assessment of the impact of SBV on animal health, animal production and animal welfare (**31 May 2012**)

For further information or any additional questions,

[sbv.ahaw@efsa.europa.eu](mailto:sbv.ahaw@efsa.europa.eu)

# Acknowledgements

**EFSA Animal Health Network** – Wim Ooms, Wim van der Poel, Helen Roberts, Trevor Drew, Edith Authié, Ann Brigitte Caij, Philippe Houdart, Claude Saegerman, Pascal Hendriks, Stephan Zientara, Charlotte Dunoyer, Paolo Calistri, Federica Monaco, Estelle Meroc, Yves Van der Stede, Anette Bøtner, Rene Bødker, Catherine Collignon, Robert Kocsis, Armin Elbers, Luis Romero Gonzalez, Ulla Carlson,

**External experts** – Martin Beer, Franz J Conraths, Armin Elbers, Dirk Pfeifer

**ECDC** - Celine Gossner

**Reporting officers** – Ingeborg Mertens (Belgium), Franz Conraths (Germany), Morgane Dominguez (France), Pasquale Simonetti (Italy), Carlo Dahm (Luxembourg), Marcel Spierenburg (Netherlands), Luis J. Romero González (Spain) and Helen Roberts (United Kingdom)

**EFSA** – Jane Richardson, Didier Verloo, Jose Cortinas Abrahantes, Angeliki Vlachou, Katriina Wilgert, Franck Berthe