Focus Article: Schmallenberg Virus
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Schmallenberg virus (SBV) is an emerging disease of ruminants which was first documented in Northern Europe during August 2011. Outbreaks have been reported in Belgium, France, Germany, Italy, Luxembourg, the Netherlands and the first cases occurred in the UK on 23rd January 2012. It is presumed to be a predominantly vector-borne infectious disease which to date has only been identified in ruminants.

SBV is classified as an Orthobunyavirus. Although the risk of infection and transmission to horses and other species is currently unknown, Orthobunyaviruses have been reported to infect horses with clinical disease, although the reported cases occurred several decades ago, were incidental and affected only a few individuals. To date there are no data relating to the presence of horses on farms infected with SBV, the presence of pregnant mares or of horses showing unusual clinical signs, however, subclinical infection cannot be ruled out. A PCR test is available via the Animal Health Veterinary Laboratories Agency (AHVLA) for the screening of suspect cases.

History
The first cases of SBV infection were identified in August 2011 in the Netherlands and Germany. Disease outbreaks in cattle comprising clinical signs of pyrexia, losses in production and condition, diarrhoea and inappetance were reported. Although individuals made a recovery within a few days, outbreaks lasted for up to three weeks and a morbidity of 20-70% was seen. Outbreaks continued throughout September which slowly declined and had stopped by the end of October. Since November 2011 cases of abortions and still births associated with congenital abnormalities have been reported in the Netherlands, Germany and Belgium which comprised torticollis, arthrogryposis and hydranencephaly, as seen in figure 1. Sheep have been mostly affected however cases have also occurred in cattle and goats.

Initial testing, carried out by the Friedrich Loeffler Institute (FLI) in Germany eliminated causes such as Bluetongue, Epizootic Haemorrhagic Disease, Rift Valley Fever, Bovine Viral Diarrhoea and other pestiviruses, however 9% of samples received were positive by PCR for novel viral material. Further work was carried out to isolate the virus and artificial infection of a small number of cattle resulted in viraemia and clinical signs of pyrexia and diarrhoea.

Fig. 1: A lamb affected by SBV, born dead with arthrogryposis, torticollis and deformed flexed limbs.
Viral Characterisation
SBV is a previously undescribed virus and our knowledge of it is incomplete. The virus belongs to the genus Orthobunyavirus, serogroup Simbu. Orthobunyaviruses are commonly seen in cattle in Australia, Asia and Africa. Initially, only very mild clinical signs are noted, however over time the clinical signs become more severe and congenital abnormalities occur e.g. neurological disorders, blindness and hyperexcitibility in the offspring of infected breeding stock. Since many other Orthobunyaviruses are transmitted via arthropod vectors such as midges, mosquitoes and flies, as well as vertically across placenta; it is assumed that SBV is also transmitted via such routes. Potential vectors have not yet been definitively identified, along with geographical distribution of the virus, viral origin and its transmissibility. Serological surveillance has not been carried out due to the lack of a serological test however work is currently being carried out in Germany and the Netherlands to develop a test.

Current situation as of February 2012
Since August 2011 surveillance programmes have been on-going in the UK, monitoring cattle on a monthly basis for clinical signs of disease. Schemes have been initiated to raise awareness of the disease and to encourage farmers and vets to submit suspicious cases to the AHVLA/SAC for investigation. A PCR test has been obtained from the Friedrich Loeffler Institute (FLI) in Germany for use in the UK and meteorological studies identified a list of 4 days per month between July and November 2011 during which incursion of potentially infected vectors may occur. The counties at the highest risk were identified to be Sussex, Kent, Essex, Suffolk and Norfolk.

The first cases of SBV were reported in the UK on 23rd January 2012 on sheep farms located in Norfolk, Suffolk and East Sussex. As of 24th February 2012, farms in the counties of Berkshire, Cornwall, East Sussex, Essex, Hampshire, Herefordshire, Hertfordshire, Isle of Wight, Kent, Norfolk, Somerset, Suffolk, Surrey, West Sussex and Wiltshire have been affected. A total of 58 animals have tested positive for the virus by PCR of viral RNA, of which 55 involved sheep and 3 involved cattle. The apparent morbidity rate in sheep is 1.37% and 0.14% in cattle. Due to the uncertainties surrounding the epidemiology of the virus, its source is unknown. Possible routes of viral introduction to the UK include the importation of apparently uninfected ruminants originating from infected areas; and windborne incursion of infected arthropod vectors, especially Culicoides spp. of midge. All of the affected farms are located in areas that have been previously identified as ‘at-risk’ for vector incursion from continental Europe.

As of 23rd February 2011, the situation in Europe comprises 668 cases that have tested positive for the virus in Germany involving cattle sheep and goats, 144 cases in Belgium, 152 in Northern France, 108 in the Netherlands and single cases in Italy and Luxembourg. These cases are geographically demonstrated in Figure 2. There are no control measures in place in any of the affected European countries.

Transmission risk to horses and other species
So far SBV has only been identified in cattle, sheep, goats and bison. Transmission to other species such as horses and exotic ruminants (e.g. llamas and alpacas) is currently unknown, although if any, the risk is considered to be very small. There are still uncertainties such as whether neonates can still be viraemic, if the immune status has any effects on future parities and how long the disease has been present in Europe.
There have been no reported cases in people who have had close contact with infected livestock. There are a small number of Orthobunyaviruses that are zoonotic but a risk profile carried out at the RijksInstitut voor Volksgesondheid en Milieu (RIVM) in the Netherlands has considered the zoonotic risk to be unlikely, and the European Centre for Disease Prevention and Control has also suggested a low risk to public health. More evidence to support the proposed level of risk is expected once further epidemiological investigations have been carried out.

Figure 2: The distribution of outbreaks of Schmallenberg virus throughout Europe

Suspect Cases
Although SBV is now a reportable disease in the Netherlands and in an area of high risk in France, this is not the case in the UK. SBV is not a notifiable disease and there are no movement or associated trade restrictions in place. Livestock owners and vets are encouraged to be vigilant and report any suspected cases to the AHVLA as part of their surveillance scheme. Stillbirths, deformities and neurological disease in neonates or fetuses of imported animals should be sent to the AHVLA for screening.

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