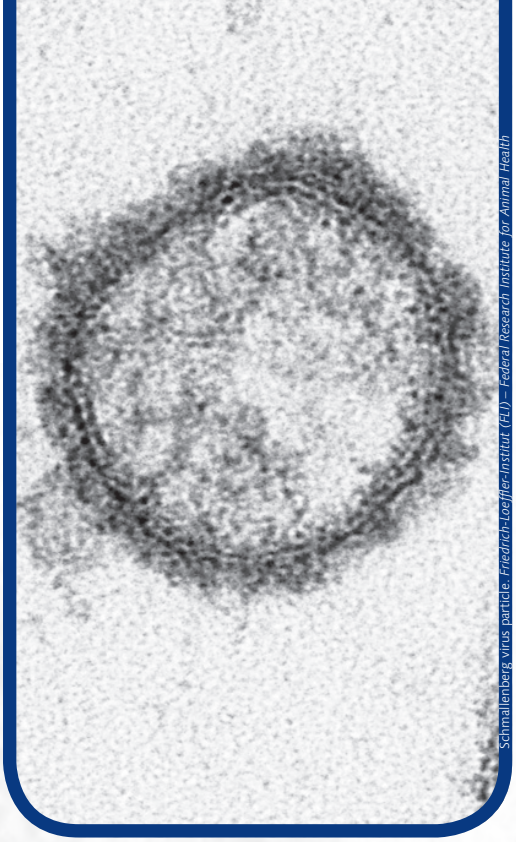
SCHMALLENBERG VIRUS



Schmallenberg virus particle. *Friedrich-Loeffler-Institut (FLI) – Federal Research Institute for Animal Health*

- Schmallenberg virus infects cattle, sheep and goats and may cause severe birth defects in offspring born from infected animals.
- The virus is likely to be transmitted by biting midges.
- There is currently no evidence that the virus causes disease in people.

OVERVIEW

Schmallenberg is a virus that infects cattle, sheep and goats. The virus appears to cause milk yield reductions in cattle (milk drop). Offspring born from infected livestock can also be severely deformed; this symptom has been most commonly observed in sheep. The disease appears to be transmitted by biting midges (*Culicoides*) that are common in Northern Europe. Cases of the disease were first confirmed in 2011; the disease is now present in the UK at a low level, primarily in southern and eastern England, and Defra figures indicate that it has so far spread to about 250 livestock holdings. Schmallenberg is classified into the 'Simbu' group of animal viruses and it is the first time that this group has been confirmed in Europe. There is no vaccine and no treatment for the disease. The only measure that might prevent transmission is to protect animals from midge bites.

CHRONOLOGY OF THE OUTBREAK

The first reported cases of Schmallenberg appeared in cows in Northern Europe in summer 2011. Confirmation of the causative agent came in November 2011 from the Friedrich-Loeffler-Institut, the main German government research institute for the study of animal disease. The disease has thus far been detected in Germany, The Netherlands, Belgium, UK, France, Italy, Luxembourg and Spain. According to the European Food Safety Authority, infections most likely occurred between May and November 2011, with highest circulation of the virus in October 2011.

The first UK cases of the disease were detected in January 2012, linked to bites from infected midges the preceding autumn. Defra and Met Office modelling of wind patterns suggest that midges blowing across the Channel from the European mainland carried the virus into the UK. The disease might also have been introduced through the import of infected animals, or might have been present in the country for a longer period at a low and undetected level.

The number of UK cases increased rapidly between January 2011 and the end of March 2011. However, the rate of increase has now slowed. This is in line with the expectation that birth defects due to the virus would be most noticeable during the spring lambing season. Cases may continue to appear and Defra have urged stock-keepers to remain vigilant.

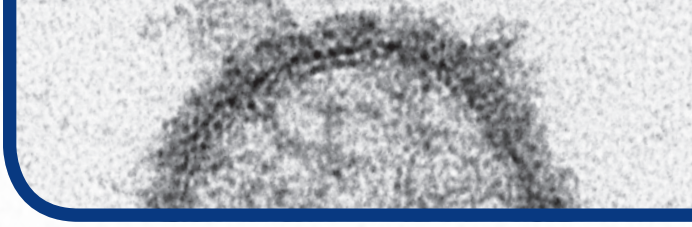
THE EFFECTS OF SCHMALLENBERG

Infection in adult cows appears to reduce milk yield. If infection occurs during pregnancy in cows and sheep, the calves and lambs may be severely malformed or stillborn. There appear to be no major health effects in adult sheep.

There is currently no peer-reviewed scientific evidence that Schmallenberg infects people or other animals, besides ruminants. German sheep farmers who had been in close contact with Schmallenberg-infected animals remained uninfected, according to an analysis by the Robert Koch-Institut, a German national public health body. Related cattle viruses such as Akabane, Aino, Sathuperi and Shamonda are not believed to cause human disease.

In adult livestock, the Schmallenberg virus is detectable in the bloodstream for only a few days and no other tissues are reported to be infected apart from the placenta in pregnant females. Once the infection has cleared-up there is no evidence that the virus remains in the animal's body. There is also no evidence for the presence of the virus in meat and milk and no evidence of disease transmission through eating animal products.

Defra routinely advise pregnant women to avoid contact with animals that are giving birth, but there are no data on a particular or heightened risk associated with Schmallenberg.



CONTROLLING SCHMALLENBERG

There is neither a vaccine nor a proven treatment for Schmallenberg. However, work is underway to develop a vaccine, but this will take years to achieve.

Protecting animals from biting midges could interrupt disease transmission. According to the Friedrich-Loeffler-Institut, the date of insemination of female animals might be arranged in a way that the vulnerable stage of pregnancy (between weeks 4 and 8 in sheep, and between weeks 8 and 14 in cattle) does not occur when transmitting midges are most active in the summer.

When Schmallenberg is identified on a holding, the holding is not closed, nor are the infected animals culled. There appears to be no benefit from culling as a means of interrupting transmission. Based on experience with the related Akabane virus, infected animals become immune naturally.

SURVEILLANCE OF ANIMAL DISEASE IN THE UK

Schmallenberg is a new disease, but outbreaks of other animal diseases are in fact a regular occurrence globally. Accordingly, there is a monitoring system in place to track them.

UK monitoring is conducted by a national network of AHVLA laboratories; and by the Institute of Animal Health, Pirbright. These government agencies draw on scientific research and training carried out in UK universities and among our international partners. They also rely heavily on the agricultural community to report cases.

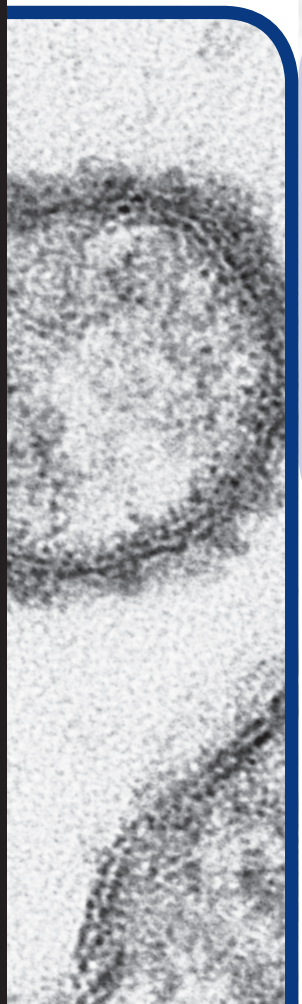
Once suspected, microbiologists have developed methods of diagnosing the disease. Given a range of diagnostic technologies, the time from first recognition to diagnosis is short, even with a new disease like Schmallenberg. Farmers and veterinarians spotted the first cases of Schmallenberg in summer 2011; by November microbiologists had pin-pointed the disease and developed a diagnostic test.

The UK imports and exports live farm animals; there is also an internal animal trade among farmers within the UK. Such animal movements can contribute to the spread of disease.

Several countries, including Russia, Turkey, Japan and the USA, have imposed various restrictions on the import of live animals, milk, semen and embryos from the EU. There is currently limited evidence for animal movement playing a part in the Schmallenberg outbreak.

Imports of cattle, sheep and pigs into the EU are permitted only from 'authorized' countries and consignments must meet animal health conditions and undergo veterinary checks. Movements within the EU are not subject to veterinary inspection but currently 40 animal diseases are 'notifiable', which means that farmers and veterinarians must report cases to government authorities.

At the EU level, trans-national shipment of live animals and animal products is monitored through the TRAde Control and Expert System (TRACES) database. The Animal Movements Licensing System (AMLS) fulfils a similar function within the UK's borders.



POINTS TO WATCH IN AN EVOLVING OUTBREAK

- Given that Schmallenberg appears to cause birth defects in sheep we might have expected to see the peak of the outbreak during the UK lambing season in March and April, after which the number of detected cases in sheep should decline. Calving can occur all year round, so we could see a continuous stream of cases in cattle.
- Knowledge of the over-wintering capacity of the virus in midges will be vital in predicting how the outbreak will progress. The current spate of Schmallenberg cases could be due to infections acquired last autumn. However, if the virus is still present in UK midges, a key factor will be warming weather: biting midges are most active in the summer months between May and September.
- A possible precedent for Schmallenberg is the bluetongue virus outbreak in autumn 2007. Like Schmallenberg, the causative agent was a virus that infects ruminant animals and is spread by midges. Also like Schmallenberg, there were initial concerns about a major outbreak. However, the outbreak died down and Defra now consider the UK free from the disease.

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