Cattle Health and Welfare Group

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Schmallenberg and Bluetongue Information note

Animal & Plant Health Agency

Background

Northern Europe experienced incursions of two vector-borne diseases within the space of four years. One was a strain of Bluetongue virus (BTV-8) never before recorded outside the continent of Africa; the other was a completely new virus not identified anywhere previously, and both were transmitted by *Culicoides* midges. This information note is intended as a simple review of current understanding, and of the disease situation.

Bluetongue

Bluetongue (BTV) is a notifiable disease. It is caused by an orbivirus, and is better described as a cluster of some 26 diseases caused by 26 strains of viruses of the same species.

BTV was previously regarded as a tropical or subtropical disease, but for decades has caused disease around the southern Mediterranean, affecting principally cloven-hooved ruminants. It is spread by a number of species of *Culicoides* midges, and does not spread from animal to animal. Some strains (BTV 8 and 16) can spread from dam to offspring via the placenta. Midges are extremely efficient at causing infection, but much less efficient at getting infected. Historically, the areas where BTV was found (mainly subtropical areas) was determined by the range and behaviour of the transmitting midges, and in higher latitudes was transmitted during the period of midge activity, dying away over the winter ('vector-free') period. More recently with climate change/warm winters and involvement of other midge species with a wider distribution, the area at risk of BTV infection has extended to cover most of Europe, and the virus has been able to overwinter by surviving in a combination of midges and host ruminants. The main means of spread is via midge movements, which may be considerable (by wind up to 250km over water and up to 16km a day), and translocation by movement of unrecognised viraemic animals.

Clinical signs vary between the serotypes of BTV but are associated with the effects of the virus on the cells lining blood vessels. A high fever is commonly seen with associated dullness; crusty red lesions develop at the junction between skin and mucosa (ie mouth, eyes, anus); also the skin of the teats and the hoof-skin junction. Swelling and oedema under the skin, especially of the lips and between the jaw are commonly seen; damage to the lung blood vessels causes respiratory distress. Death is not uncommon. Signs of chronic disease include muscle wastage,

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infertility, lameness and abortion. BTV 8 and some live vaccine strains of BTV16 are also able to cross the placenta, causing profound brain damage and leading to death or 'dummy' calves and lambs. Generally, more severe signs are seen in sheep, less severe in cattle, wild ruminants and camelids.

Treatment is not available directly, but supportive nursing, anti-inflammatory treatment and antibiotics where secondary infection is present, can help. Vaccines are available, live attenuated in Europe but only killed in GB. Each serotype requires its own vaccine; there is no cross-protection between the serotypes.

Current situation: A number of serotypes continue to circulate around countries of the Southern Mediterranean, with regular incursions across the sea from Northern Africa to the Iberian Peninsula, Italy and the middle east- the latter frequently associated with animal movements associated with religious festivals. However last year BTV4 spread rapidly across the Bosphorus to the Balkans, reaching Eastern Europe including, Greece, Crete, Romania, Bulgaria and Hungary with cases still being recorded in early December, in areas associated with midges typical of those seen in northern Europe. In addition, incursions of BTV4 have occurred through southern Spain and Portugal. In both areas, overwintering is highly likely, which could result in potential onward spread through midge and animal movements into 2015. Although the risk is currently low, the further the spread, the greater risk of incursion into GB.

Prevention: Although BTV is notifiable which provides movement restrictions, midge spread is unpredictable, and disease could also go undetected ahead of animal movement restrictions. Those intending to import animals from mainland Europe are advised to check carefully the location from where animals have or may have come from, and seek advice from the import section of APHA. Vaccine is available in mainland Europe, but not currently in GB.

APHA undertake surveillance for BTV by post import testing of all sheep and goats imported from countries that have BTV. Our Import team report that there have been no sheep or goats imported from countries affected by BTV during 2014.

Control measures for trade in live animals are in place in line with the Bluetongue Regulation, EC/1266/2007. The UK has published an updated Bluetongue disease control strategy which is available on the UK.gov website: http//www.gov.uk/government/publications/bluetongue-gb-disease-control-strategy

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Schmallenberg Virus (SBV)

SBV is not a notifiable disease. It was first detected along the Dutch/German border in 2011, and spread extremely rapidly reaching GB in 2012. It is caused by an orthobunyavirus that is related to Akabane virus. Some orthobunyaviruses are zoonotic (ie in which disease can spread from animals to man); however, there is no evidence that SBV is zoonotic.

SBV is spread by *Culicoides* midges; like BTV, infection is very efficient midge to animal but, unlike BTV, is also spread very efficiently from animal to midge. This means that disease spread can be very rapid within and between herds and flocks even though the period an animal carries the virus (viraemia) is only 5-7 days compared to 14 days in BTV. Sheep, goats and cattle are affected.

Clinical signs: Unlike BTV, most infection of adult animals is inapparent unless high levels of virus are generated, and more severe signs are seen in cattle than sheep. Adult cattle develop a fever, acute drop in milk (up to 50% of previous production which is recovered over about a week) and in some cases profuse diarrhoea affecting from a few to a large proportion of the herd. This acute infection passes through the herd in about 3 weeks, after which production recovers, but there are reports of drops in fertility (for example, increased number of services per conception).

The other main clinical signs are seen in near-term lambs and calves. The virus is teratogenic, ie it causes damage to the growing fetus resulting in arthrogryposis (twisted limbs and spine), hydranencephaly (water on the brain) leading to stillbirth or in some cases 'dummy' calves. This transplacental infection occurs more frequently in lambs and less frequently in calves. Typically small numbers of lambs and calves are affected, unless management practices have led to a high proportion of the flock or herd becoming infected in the early part of pregnancy- for example, the use of synchronised breeding in some pedigree sheep flocks led in a few cases to incidents where up to 30% of lambs were affected.

Current situation: SBV is endemic in much of northern Europe and has spread as far North as Finland. SBV was detected in England, Wales and Ireland and in very localised areas of Scotland. There was limited evidence arising of suspicion of acute disease during 2014 in areas of the southwest and the Wales/England border area. However, there is clear evidence from mainland Europe that even though SBV may be endemic in an area, not all flocks or herds have been infected, nor have all

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animals within herds and flocks been infected. Therefore as time goes on and the proportion of replacement animals lacking immunity to SBV increases, so the potential for reinfection will increase.

There is no requirement to report disease; hence there is a low level of reporting across Europe although most countries have had cases. Recently, pre-export testing of heifers of breeding age from Holland detected seroconversion (ie production of immunity), and in some cases virus was also detected, indicating that these animals had become infected. This is the type of animal which is very likely to be imported into GB; there is therefore a very low risk (given the short incubation period) of importation of animals carrying the virus, but a higher risk of animals carrying deformed calves. Those considering importing animals especially potentially pregnant animals from mainland Europe should consider carefully from where they source animals, and should ensure that appropriate testing is carried out prior to importation.

Two vaccines were available in GB but, despite warnings, due to lack of uptake neither is currently available. Although these vaccines could be brought relatively quickly back into production, there will be a lag during which animals will not be able to be vaccinated. Cattle, sheep and goat owners are strongly advised to consult their veterinary surgeon to ensure that they have an active up to date flock or health plan which includes provision for SBV, and that advice is sought to determine what their flock or herd SBV status is and what might be done to protect livestock from disease.