



Veterinary surgeons and their farming clients should all be 'on alert' for bluetongue

Bluetongue virus serotype 8 in sheep and cattle: a clinical update

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BLUETONGUE was diagnosed in sheep in the Netherlands on August 14, 2006. Subsequent investigations indicated that the disease had been present in Belgium and Germany for several weeks beforehand. Bluetongue is a vector-borne disease that usually clinically manifests only in sheep, but this northern European outbreak also clinically affected cattle. The vector in the outbreak was *Culicoides dewulfi*, a subspecies of *Culicoides obsoletus* that is also present in the UK. Other *C obsoletus* subspecies or *Culicoides pulicaris* may have been involved, all of which can be found in the UK. Professor Philip Mellor, head of the European Community Reference Laboratory for Bluetongue at the Institute for Animal Health at Pirbright, refers to *Culicoides* midges as 'plankton of the air' as they have the ability to travel great distances in air currents. A concern is that, if bluetongue should re-emerge this summer or at a later date in mainland northern Europe, it may also appear in the UK; particularly high-risk areas are southeast England and East Anglia, although no area should be considered risk free. This article describes the clinical signs of bluetongue, based on those that were seen in the Netherlands last year, with the aim of helping practitioners to recognise and report the disease promptly in the event of a UK outbreak.

EMERGENCE OF BLUETONGUE IN NORTHERN EUROPE

Over the past 10 years, there have been several incursions of bluetongue into southern Europe. Until 2006, it was thought that the disease was unlikely to spread to northern Europe because its epidemiology had been

geographically limited and, while potential midge vectors had been identified, it was considered unlikely that infected populations would be established.

The outbreak in northern Europe was completely unexpected. The virus responsible was identified as a sub-Saharan serotype: bluetongue virus (BTV) serotype 8. Nearly a year later, the origin is still obscure, but may have involved illegal imports of live animals, importation of infected *Culicoides* species, or contaminated vaccines. The outbreak also differed from the classical situation where clinical signs of bluetongue are seen in sheep and cattle are symptomless carriers.

Culicoides midge populations are decimated by frost and cold weather, reducing the risk of recurrence of the disease the following year. Unfortunately, last winter in northern Europe was the mildest for decades, raising concerns that bluetongue will re-emerge this summer.

Diagnosis through collaboration

The Animal Health Service Ruminant Watch Programme involving farmers, private veterinary practitioners, ruminant specialists and the GD Deventer Surveillance Network, which includes official veterinary officers from the Food and Consumer Safety Authority, was instrumental in the early detection of bluetongue in the Netherlands. The programme's success depends on trust and building good relationships between all the stakeholders, and it is highly valued by farmers and practitioners as well as policy makers. It has proved its worth by identifying the first incidence of clinical bluetongue in a part of Europe where the disease was totally unexpected.

'Bluetongue' is something of a misnomer, as hyperaemic/purple colouration and protrusion of the tongue were only seen in 19.5 per cent of infected sheep flocks and 4.9 per cent of infected cattle herds in Belgium, France and the Netherlands in the 2006 outbreak.

Clinical signs in sheep



There is a clear nasal discharge initially, which later becomes purulent and blood-stained



Single (left) or multiple (right) haemorrhages may be seen in the buccal mucosa



Swelling of the face is a consistent feature



Purple-coloured mucosae and foamy saliva on the lips may be seen



There is congestion and swelling of the buccal (and nasal) mucosae



Coronitis (above) can occur, leading to a typical 'hunchback' appearance (right) and severe lameness. Frequently, affected sheep are reluctant to rise



Wool break can occur several weeks after the onset of the first clinical signs



- Initially, there is an elevated rectal temperature (42°C), but later in the disease this drops
- Disease commonly progresses to recumbency and death

(left) Bottle jaw may occur. (right) Muscle necrosis of the limbs results in a characteristic stilted gait



Clinical signs in cattle

The outbreak of BTV serotype 8 in northern Europe differed from previous outbreaks in southern Europe and elsewhere in that cattle exhibited clear clinical signs.

- The initial symptoms are not dissimilar to malignant catarrhal fever
- Initially the rectal temperature is elevated to 40°C
- Mucous membranes are congested
- There is a purulent nasal discharge



Lacrimation is seen, but without ulceration or major ocular changes



The muzzle is congested with shedding of the mucosa



There is marked congestion and petechial haemorrhages of the buccal cavity



(left) Profuse salivation. (above) Affected cattle may be severely lame due to coronitis. (right) Linear ulceration of the teats is characteristic



THE DUTCH OUTBREAK

The first case of bluetongue in the Netherlands involved a dead lamb and a single sick ewe on a farm with 28 Mergelland ewes and lambs. The second case involved a dead ewe and two sick ewes on a farm with 90 mixed-breed ewes and lambs. The farms were visited by an official specialist team and samples were submitted to the Central Institute for Animal Disease Control Lelystad (CIDC-Lelystad), which confirmed a diagnosis of bluetongue on August 15, 2006, after which EU control measures were introduced on August 18. On August 19, cases of bluetongue were confirmed in Belgium and Germany. On August 26, the BTV was identified as serotype 8.

The morbidity rate in Dutch, German and Belgian sheep flocks in this bluetongue outbreak ranged from 0 to 100 per cent, but 80 per cent of flocks had a morbidity

rate of between 0 and 25 per cent. Mean morbidity in infected sheep flocks was 20 per cent. Mortality rates in flocks ranged from 0 to 100 per cent, but 93 per cent of the flocks experienced a mortality rate of between 0 and 20 per cent. Mean mortality in sheep was 5 per cent.

Statutory control of bluetongue in the UK

- Bluetongue is a notifiable disease and, if suspected, must be reported as quickly as is practicable to the Divisional Veterinary Manager (DVM) at the local Animal Health Office
- The Bluetongue Order 2003 implements European Directive 2000/75/EEC
- Once bluetongue is suspected or confirmed, no movement of ruminants is allowed on or off an infected premises (IP)
- A 20 km infected zone (IZ) is applied around the IP
- A protection zone (PZ) of at least 100 km is applied around the IP with a further surveillance zone (SZ) of at least 50 km around the PZ. Various restrictions apply, details of which can be accessed on the Defra website (www.defra.gov.uk) under bluetongue

Goats and camelids

Clinical signs of bluetongue were not seen in goats or camelids in the Netherlands, but it is not clear whether they acted as symptomless carriers of BTV serotype 8. Further serological investigation is continuing. Clinical signs due to other BTV serotypes have been seen in both goats and camelids in other countries.

DIFFERENTIAL DIAGNOSIS

Sheep

In some outbreaks of orf in adult sheep, swelling of the lips and muzzle occurs, which may potentially be confused with bluetongue. Single or multiple haemorrhagic lesions in the mouth may be mistaken for foot-and-mouth disease (FMD), but the classic sign of bluetongue is a swollen face which is absent in cases of FMD. Haemonchosis or chronic fluke infection with a bottle jaw may present similarly to bluetongue, but examination of the conjunctivae reveals a marked anaemia. Strawberry footrot in its early stages could also be confused with bluetongue, but generally there is a proliferation of tissue in the area of the coronet. Early contagious ovine digital dermatitis (CODD), particularly in a flock outbreak, also produces lesions at the coronet but, unlike bluetongue, the hoof case is rapidly shed. Cobalt/vitamin B₁₂ deficiency may be confused with bluetongue. Sunburn affecting white-faced sheep needs to be eliminated, as does facial eczema and photosensitisation in all animals. Nasal bot fly infestation is another possible differential diagnosis in sheep and also needs to be eliminated.

Cattle

Malignant catarrhal fever (MCF) is the main differential diagnosis in cattle, but animals with MCF have far greater erosion of the muzzle and more profuse purulent nasal discharge. Ocular changes are more severe and corneal opacity is always present, as is hypopyon. FMD could be confused with bluetongue if oral discharge is excessive, but cases of FMD present with drooling saliva which is absent in animals with bluetongue.



Swelling of the lips and muzzle in a sheep with orf



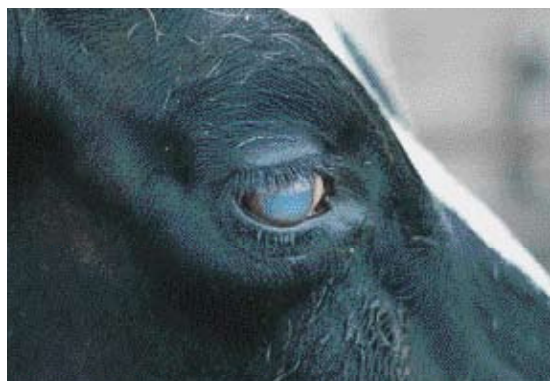
Marked anaemia of the conjunctiva in a sheep with haemonchosis



Coronary band lesions in a case of strawberry footrot (above) and contagious ovine digital dermatitis (right)



(left) Sheep with acute cobalt/vitamin B₁₂ deficiency. (middle) Signs of cobalt/vitamin B₁₂ deficiency a few weeks after the onset of the first symptoms and without treatment. (right) Photosensitisation and facial eczema can present similarly and are other differential diagnoses to consider



Severe erosion of the muzzle and profuse purulent nasal discharge (left) and corneal opacity (above) in a cow with malignant catarrhal fever

TREATMENT

While infected premises are under restrictions, sick animals may be treated, with a view to trying to reduce pain and preventing secondary infection. Treatments include:

- The use of non-steroidal anti-inflammatory drugs to reduce pain;
- The use of long-acting antibiotics to control secondary bacterial infection;
- Supportive fluid therapy to manage dehydration;
- Careful nursing to speed up recovery in those animals that are not too severely affected;
- The provision of a clean drinking trough for cattle to help cool their muzzles.

New syringes and needles must be used for each animal to reduce the spread of disease.

Animals with severe muscle necrosis or coronitis usually make an incomplete recovery and should be



Resolution of buccal cavity lesions after treatment. The oral lesions in the same cow, 10 days earlier, are pictured on page 316

ethanased to prevent further suffering. Treatment appears more rewarding in cattle than in sheep, with a substantial number recovering quickly and lesions healing rapidly.

Prevention

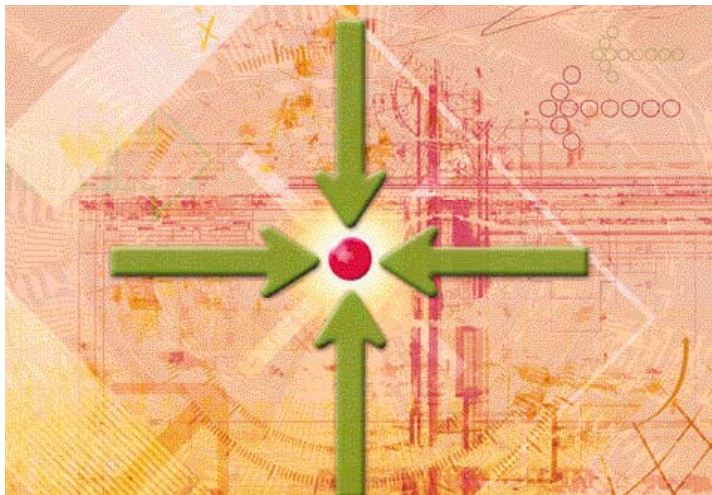
It is difficult to avoid the midge vectors of bluetongue, and even a single bite from an infected midge can produce disease. Unlike other *Culicoides* species, *C. dewulfi* will enter buildings, so housing of livestock may not be an effective preventive measure. The efficacy of insecticidal dressings is unproven, but frequent applications of synthetic pyrethroid pour-ons may reduce midge activity. In the Netherlands, several cases of bluetongue occurred in sheep previously treated with synthetic pyrethroid pour-ons. However, midges do not become immediately infective on ingestion of infected blood – a period of capacitance is necessary before the midge can pass on infection and only after ambient temperatures reach 20°C.

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SUMMARY

- Bluetongue is a notifiable disease.
- There is *no* zoonotic risk from bluetongue.
- There is no slaughter policy for the control of this disease. However, individual animals may need to be euthanased on humane grounds and, initially, to prevent the establishment of an infected midge population.
- Sick animals may be treated.
- Veterinary practices should contact their local DVM for advice about the preparation of contingency plans for dealing with an incursion of bluetongue.
- It is far better to suspect and report disease, and subsequently be proved wrong, than to lightly dismiss a suspicious case and potentially miss an index case.
- Veterinary surgeons should remind clients about the disease, its symptoms and the procedures for its control, should it strike.



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