Diocese of Hereford
Agriculture & Rural Life
Serving the Church of England in Herefordshire,
South Shropshire & parts of Powys & Worcestershire

THE CHURCH OF ENGLAND

Bluetongue Virus (BTV)

BTV is spreading as a consequence of global warming. It affects ungulates and the State Veterinary Service is concerned that wild deer might act as reservoirs of the virus. The disease is caused by a retrovirus and there are 24 known serotypes. Southern Europe currently has serotypes 1, 2, 4, 9 and 16; whilst Northern Europe has serotype 8.

The midge vector
The disease first emerged in Europe in 2006. It can not be spread from animal to animal except via an insect vector. These are midges of the genus *Culicoides* and 6 species occur in the UK. Research shows that our indigenous species are capable of carrying the disease though they may not be as effective vectors as African species. The midges can be dispersed over long distances. *C imicola* is the main carrier worldwide, though is not found in the UK. One of the northern European species, *C dewulfii*, likes manure heaps and also likes being indoors so the recommendation to house livestock may not be a good control mechanism and has not been promoted in the UK. The lifespan of the midge averages 2-3 weeks though it can be longer, and they are most active at dusk and dawn.

The cycle of infection
BTV must have the midge present to spread from animal to animal and the virus has an incubation period within the vector of between 4 and 20 days. Once a sheep has been bitten by an infected midge it takes between 2-4 days before it in turn becomes capable of transmitting the virus to other midges which bite it. There is evidence that the virus can be spread by blood, which has implications for any blood testing that vets carry out on farms e.g. for TB. The maximum duration in sheep is up to 50 days, whilst in cattle it can survive for 100 days with an incubation period of between 6-9 days. The virus may be transmitted via semen but there is no evidence of ovarian transmission from mother to sibling. The key period of infection is between April and October.

There is evidence that the virus is capable of over-wintering in ruminants and the eggs and larvae of the midges are also capable of over-wintering. Mild winters in particular may not, therefore, be entirely risk free and should be thought of as periods where there is “low risk of transmission” rather than no transmission at all.

The effects of the virus
The virus affects the lining of blood vessels and the mucus membranes, leading to haemorraging and oedema (swelling due to fluid), though this is largely internal and may be unobserved. Clinical signs are the three “F’s” Fever, Face and Feet.

Sheep show a swollen face, nasal discharges, salivation and have difficulty breathing, accompanied by high temperatures and usually pronounced lameness. The fleece can be shed. The “blue tongue” is quite rare and is usually only seen at the end of the animal’s life due to the respiratory problems it is encountering. Deaths may be as high as 70% of the flock and those that survive often lose condition and show marked reductions in meat and wool production. In Europe, during 2007, deaths were running at between 15-30% of infected flocks.

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Cattle show less pronounced clinical symptoms and some may not display any adverse effects at all. Where there are signs there will be some or all of: nasal discharge and swelling of the head and neck, together with runny eyes, ulcerations in the mouth, swollen teats and salivation. The animal looks "depressed". Most cattle will recover from the disease. Superficially some of the symptoms are similar to those for foot and mouth disease (though there is no facial swelling with FMD) and can also be similar to other problems that cattle have such as allergic reactions to grass pollen etc.

There is no specific treatment other than palliative care for a sick animal - gentle handling, sheltered conditions, soft food and access to water, together with antibiotics and anti-inflammatories. If animals show acute signs then humane disposal should be considered. There is no risk from either meat or milk to humans.

Control strategies

BTV is a notifiable disease. Midges are monitored via midge traps across the country to assess whether the virus is present in the midge population. A single infected animal does not constitute an outbreak, the virus has to be "circulating" (i.e. evidence of infection being spread by the midges), at which point the control measures take effect.

The initial response is containment. The single most important factor in the spread of the disease across Europe has been inadvertently moving infected animals to locations which were previously virus-free. This has spread the disease quicker than the movement of the midges themselves. Thus, if a case of BTV is suspected the farm will be placed under immediate movement restrictions. If the test is +ve a 20km Protection Zone is imposed with severe movement restrictions and a wider (150km) Surveillance Zone which allows movement within the zone but not into or out of it. Control of the midge vector is difficult to achieve though synthetic pyrethroids will be used on animal transport and on animals used for breeding. Care must be taken in the siting of dung heaps.

A vaccine is under development but it must be serotype specific. Vaccines have only been developed for use in sheep so far and Defra have ordered between 10 and 20 million vaccines. It is not yet clear what the vaccination strategy will be and whether it will be compulsory or voluntary etc. It is likely that other serotypes, in addition to serotype 8, will spread to the UK so multiple vaccinations may be necessary. There is also concern about the type of vaccine to be used. Evidence from Italy where attenuated live vaccine was used was that it hybridized with the live virus and posed a greater risk to the animal. Live vaccines can not be used with pregnant animals

The spread of the disease across Europe

BTV reached the UK for the first time in 2007, and also reached Denmark and Switzerland. It only appeared in Europe in 2006 so the spread has been significant. During 2007 the disease was first identified two months earlier than in 2006, and was found to have more serious effects. It is felt that the spread in the UK was not as great as it could have been because of the movement controls that already existed for the outbreak of Foot and Mouth Disease.

In 2007:

- Belgium had 4,138 outbreaks and 2-3,000 deaths of sheep per week during the summer.
- Germany had 11,321 outbreaks and an average of 430 sheep dying per week.
- France had 2,100 outbreaks, mostly in cattle
- Holland had 5,051 outbreaks and an average of 800 sheep dying per week.
- Luxembourg suffered 940 outbreaks, one third in sheep and two thirds in cattle.

By 16th November 2007 the UK had 241 reported cases, of which 64 had been confirmed. 27 of these were picked up by the blood testing taking place on infected farms rather than through symptoms shown by the animal. To date the UK has had a higher incidence in cattle than in sheep.

The implications for the Diocese

It seems likely that we will see a continuation of BTV in 2008, and probably much earlier in the year than we experienced in 2007. The disease will have a significant impact on the livestock industry, though it is unlikely to have an impact on the rest of the population in the way that FMD did. We should be prepared to extend pastoral care and concern to the farming industry during this period. The experience from the FMD outbreak in 2001 suggests that it would be helpful if parishes could begin to identify the names and addresses of farmers with whom we might subsequently want to get in touch via letters or e-mail, so that we are in a position to address pastoral needs as soon as necessary.

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