

WHAT PIRBRIGHT IS DOING

Joint campaign Against Bluetongue (JAB)

Pirbright's world-leading experts provide information and advice on BT to the UK government (Defra) and international animal health agencies.

Our scientists have also supported national information campaigns, such as JAB (Joint campaign Against Bluetongue) working with Defra, the National Farmers' Union (NFU) and other agencies to raise awareness and improve understanding about the disease.

During the most recent JAB campaign, our scientists spoke about BT at numerous roadshows held across the UK for local vets and farming

communities. It's important to ensure farmers and vets are informed as it means in the event of an outbreak, the UK is well placed to respond and to control the disease as quickly as possible - helping protect the nation's food supplies and economy.



At the forefront of vaccine design

Vaccines are available for BTV but they are serotype-specific, which means that a vaccine that protects against one type of the virus won't protect against another. Pirbright is leading research into vaccine development and has made a major contribution to work ensuring single serotype vaccines are highly effective in the field. Cost-effective vaccines against multiple virus serotypes have not yet been developed, but are the subject of our current research.



Diagnostics and surveillance

Pirbright is home to the OIE (World Organisation for Animal Health) Reference Laboratory for BT. It is on the front line for responding to outbreaks; receiving samples for diagnosis from the UK, Europe and across the world. Rapidly diagnosing the correct strain of the virus is crucial, so the appropriate vaccine can be identified and the disease controlled as quickly as possible.

Our researchers work closely with colleagues in the Pirbright Reference Laboratories to develop quicker and more accurate diagnostic tests that can be used in the field. Rapid diagnosis enables disease control measures to be put in place more quickly, saving animal lives. Pirbright also collaborates extensively with researchers around the world to help improve testing and support international monitoring and surveillance.



Social and economic impact

BT causes huge economic losses worldwide both to individual farmers and the wider agricultural industry due to bans on the trade of livestock from affected countries.

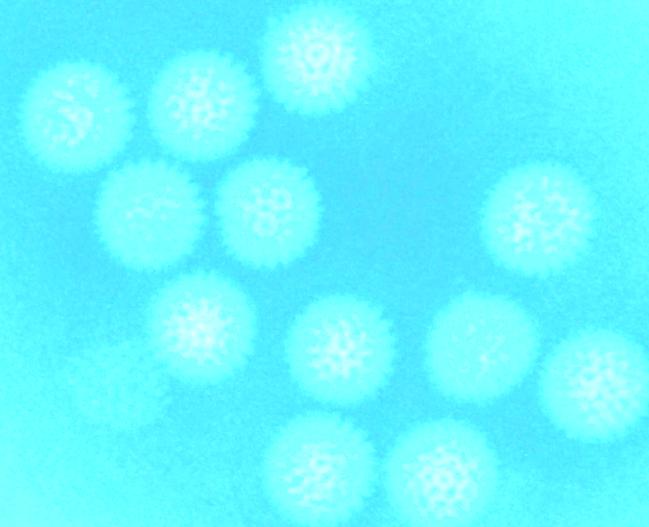
In India for example, BTV impacts on subsistence farming when midge populations increase after monsoons. In the UK, warmer winters mean that adult midges are active for longer which extends the period that livestock are at risk from transmission of the virus.

For over 40 years, Pirbright has played a vital role in helping to contain and stop outbreaks of BT across the world, such as the one in northern Europe of BTV serotype 8 (2006-2009), which included the UK. This outbreak was estimated to have cost the countries affected over £800 million and was only eradicated after a major vaccination campaign.



www.pirbright.ac.uk/bluetongue

BLUETONGUE VIRUS



Preventing and controlling viral disease

BLUETONGUE VIRUS - KEY FACTS

Bluetongue (BT) is a disease that affects farm animals such as sheep, cattle and goats and also wild animals such as deer.

Sheep are most severely affected by BT and the disease can result in death. BT does not affect humans and does not pose a food safety issue.

Bluetongue virus (BTV) which causes the disease, is mainly spread by *Culicoides* biting midges. The midge season is normally March to September.

On rare occasions, BTV can be transferred during pregnancy to the offspring of infected animals and sometimes spread by contaminated objects like surgical equipment.

BTV is an *Orbivirus* within the virus family *Reoviridae*. There are at least 27 serotypes (types) of BTV and new types are still being discovered.

BTV is present on almost every continent and in recent years it has spread north into Europe, increasing its threat to the UK.

PREVENTION

Understanding how BTV is spread is vital to ensure all the necessary preventative measures are in place. The weather, especially temperature and wind direction, can have a significant impact, since infected midges can be carried on the wind over long distances.

Scientists at Pirbright play a crucial role in Europe-wide efforts to monitor and predict the spread of BTV. Working in partnership with the UK's national weather service, the Met Office, our world-leading experts have developed sophisticated mathematical models which are used to produce maps (as shown), simulating where outbreaks might occur. Their work enables targeted surveillance and informed predictions of BTV transmission within the UK, including the impact of climate and vaccination strategies.



CONTROL

BTV free countries like the UK strictly control the movement of livestock across their borders to prevent infected animals being imported. If there is a continental outbreak in countries adjacent to the UK, southern and eastern England in particular can be at risk from infected midges carried by the wind.

Measures to control biting midges are limited. Stabling animals (when feasible) and protecting them during transportation can help to prevent transmission. This is not an alternative to vaccination however, which is the only effective way to control an outbreak.



CLINICAL SIGNS

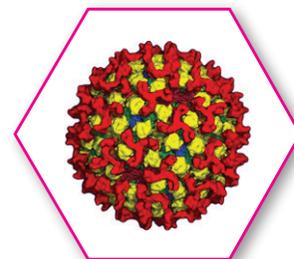
Clinical signs usually occur 5-10 days after infection in sheep and the severity of symptoms can vary depending on the strain, the animal and the environment. Cattle are the main carriers of BTV, but generally do not show any signs of the disease.

BT can lead to death and cause abortion or deformities in lambs or calves.

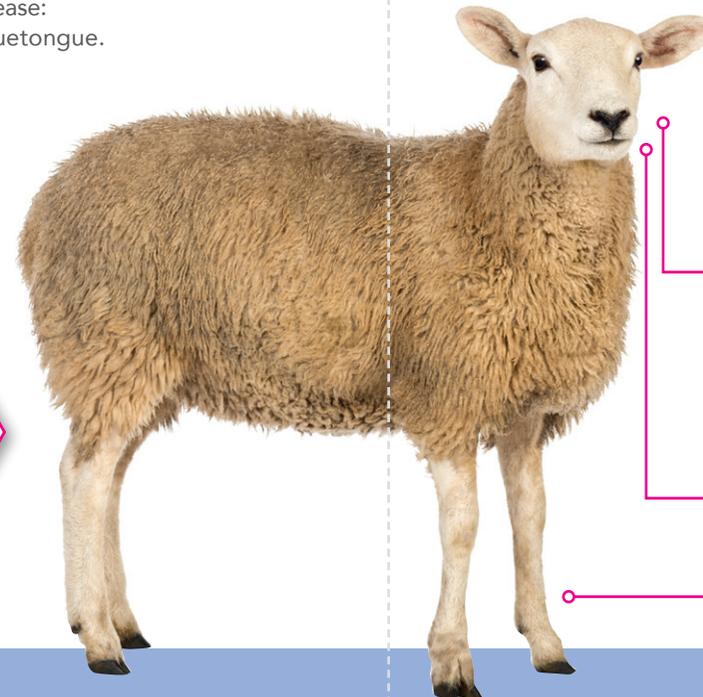
BT is a notifiable disease and should be reported. Please see the Defra website for advice on how to spot and report the disease: www.gov.uk/guidance/bluetongue.



Bluetongue virus is spread by *Culicoides* biting midges



Bluetongue virus



Fever and swelling of the face, lips and tongue (hence the name "bluetongue") and breathing difficulties.

Sores on the nose, gums and dental pads and reddening of the mucosal membranes of the eyes, nose and mouth.

Lameness.