WHAT PIRBRIGHT IS DOING

A new vaccine for AHSV

Scientists at The Pirbright Institute are leading the way in helping find a safe and effective vaccine for AHSV. Existing vaccines using the live virus make it difficult to determine from blood samples if a horse has been vaccinated or infected with AHSV.

The vaccine strategy developed at Pirbright would enable horses to be differentiated and help ensure the safer movement of animals locally and internationally. This uses modified vaccinia Ankara virus (which is harmless to horses), to carry and deliver the gene of AHSV that creates the protection against the virus.

This technique could potentially be used in a 'polyvalent' approach; meaning that it could be capable of protecting against each of the nine different AHSV serotypes.

With the support of the OIE, the Institute is currently working with other research institutes around the world to evaluate potential new AHSV vaccines candidates, including the one being developed at Pirbright. We are also collecting the evidence needed to support a business case for the manufacture of these new vaccines.

Diagnostics and surveillance

Pirbright is one of four OIE reference laboratories for AHSV and provides early warning, rapid diagnosis, emergency response and expert advice to the UK and international governments.

We coordinate international projects to standardise and harmonise the use of AHSV diagnostic tests. The Institute also advises on and contributes to comprehensive codes of practice for the safe international trade of horses.

Our scientists also monitor global patterns of disease distribution and identify the correct vaccine to be used in the event of an outbreak.

We have recently developed a fast and portable, prototype diagnostic test for AHSV, which could potentially be used in the field without the delay of sending samples to a laboratory. This is important because rapid, accurate diagnosis is vital in controlling the spread of the virus and helps prevent more animals from becoming infected - saving lives.

Social and economic impact

AHSV has a huge impact worldwide. With such a high mortality rate amongst horses, the disease causes major economic losses for the equine industry and owners of working horses. International travel bans also present significant issues for equine sport and world horse racing.

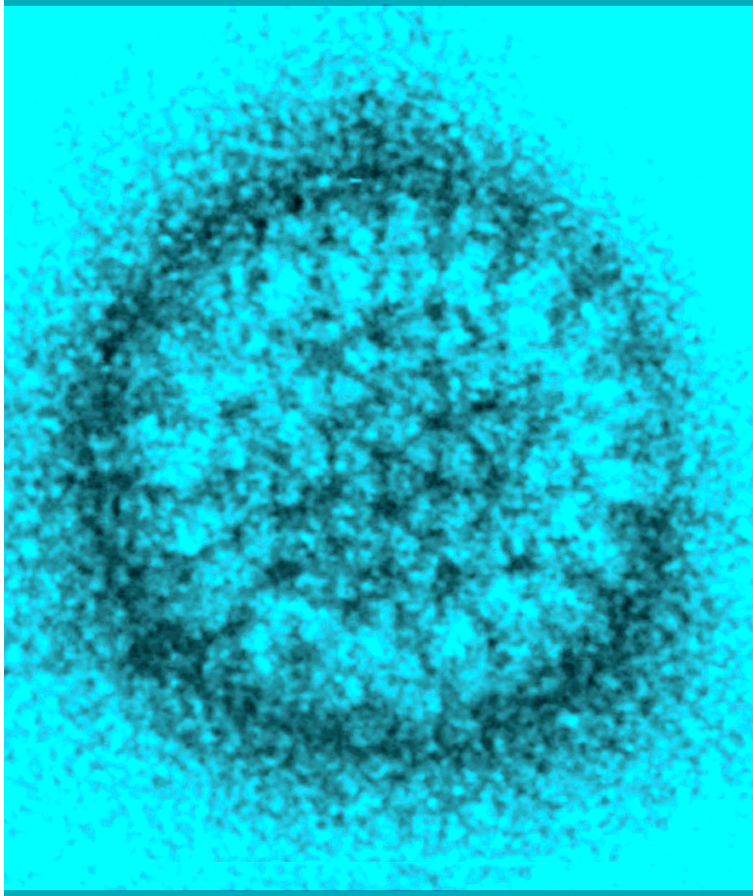
There has never been a UK outbreak of AHSV but the cost of a major European outbreak to the British equine industry, has been estimated at up to £3.5 billion.

THE Pirbright INSTITUTE

BBSRC bioscience for the future

www.pirbright.ac.uk/ahsv

AFRICAN HORSE SICKNESS VIRUS



THE Pirbright INSTITUTE

Preventing and controlling viral disease

AFRICAN HORSE SICKNESS VIRUS - KEY FACTS

African horse sickness virus (AHSV) infects all equine species including horses, donkeys, mules and zebras as well as camels.

It is one of the most deadly equine viruses and can be fatal in up to 90% of infected susceptible animals.

It can also affect dogs, which can be infected by eating horse meat containing AHSV. The virus does not affect humans.

There are nine types (serotypes) of AHSV. It is from the *Reoviridae* family of viruses and is categorised as an *Orbivirus* within that family.

AHS is not directly contagious, but is spread by *Culicoides* biting midges that have been infected by biting an affected animal.

It is prevalent in central and sub-Saharan Africa, but major outbreaks have also been reported in the Middle East, India, Pakistan, Spain, Portugal and Morocco.

PREVENTION

AHSV-free countries such as the UK and the rest of the EU heavily control the movement of horses. Although AHSV is currently restricted to sub-Saharan Africa, it has a history of emergence into southern Europe. Strict international travel regulations are therefore in place to prevent infected animals being moved from regions where the virus is prevalent.

Vaccines are available using the live attenuated virus (a virus that has been made less virulent), in some countries such as South Africa where AHSV persists. These vaccines are not considered safe enough (as the pathogen is still live), for licensed use in countries where the virus is not present, including the EU.

CONTROL

There is no specific treatment available for AHS, other than supportive treatment. Measures to control the exposure of horses to biting insects, together with movement restrictions and efficient detection systems (rapid diagnosis), are essential to prevent an outbreak from spreading.

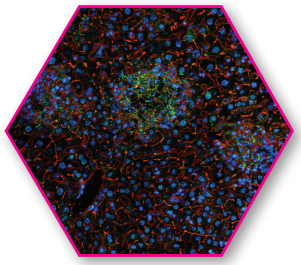
AHS is a notifiable disease in the UK and must be reported. Further details are available from the Defra website: www.gov.uk/guidance/african-horse-sickness.

AHS is the only equine infectious disease for which the OIE (World Organisation for Animal Health), issues an official declaration of disease freedom to its member countries.

CLINICAL SIGNS

AHSV can cause different forms of the disease:

Cardiac form:
Fever, swelling around the eyes, lips, cheeks, tongue and neck and in some cases colic may also be seen.



Cells infected with AHSV

Mixed form:
Some animals may display a combination of clinical signs from the cardiac and respiratory forms.

Horse sickness fever:
Animals that develop horse sickness fever often recover from the disease. Symptoms include a few days of fever, depression and reduced appetite.

Respiratory form:
Fever, breathing difficulties, coughing, sweating and a frothy discharge from the nostrils with death occurring within a few hours.

AHSV is spread by *Culicoides* biting midges

Vaccine image courtesy of Nicky Manning