

Ovine Pulmonary Adenocarcinoma

• What is it?

Ovine pulmonary adenocarcinoma (OPA) is a contagious viral disease causing lung cancer in sheep. OPA is also known as jaagsiekte, which means 'driving sickness' in Afrikaans. It has been reported in Europe, Asia, Africa, the Americas and is present in the UK. The disease is invariably fatal and has both economic and animal welfare implications.

• Cause and impact of disease

The disease is caused by the jaagsiekte sheep retrovirus (JSRV). There is little information on how the virus is transmitted or the proportion of infected flocks. However data collected by SAC Disease Surveillance Centres suggest that it is distributed around Scotland with some farmers ascribing losses of 5-10% of sheep per year to the disease.



Above and main picture: *The wheelbarrow test. One person lifts the back-end up whilst the other holds the front end and pushes the head down. In a positive wheelbarrow test a few ml or more of fluid will flow from the nostrils within a minute of lifting the animal.*

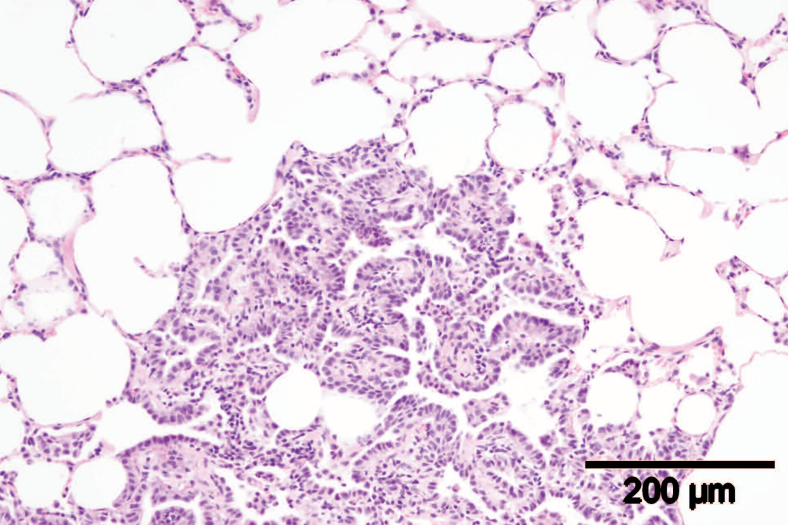
• Disease symptoms

Classical clinical symptoms of the disease are:

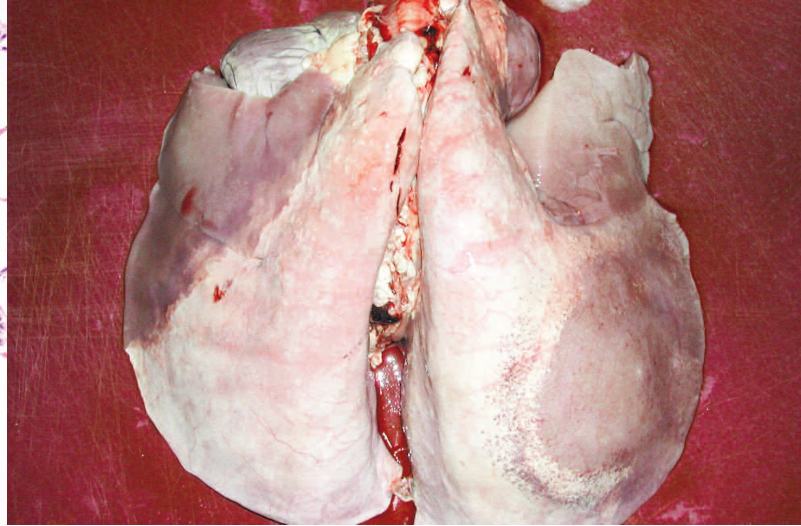
- Loss of condition, although sheep remain alert with a good appetite
- Increasing breathing difficulties, especially after exercise (hence the name 'driving sickness')
- In some cases, discharge of fluid from the nostrils can be observed when the head is lowered (wheelbarrow test, see below)

Clinical disease generally occurs in older sheep and ends in death after weeks or months, sometimes due to secondary pneumonia. No available diagnostic blood tests can identify affected sheep before clinical signs develop. Although usually several sheep in a flock are affected, often only a single sheep is noticed at any one time. The development of symptoms therefore is slow and not eye-catching. The symptoms of OPA and pneumonia are similar, but sheep suffering from OPA do not respond to antibiotic treatment and have a normal temperature. If JSRV is introduced into a flock formerly free from disease, losses due to OPA might be substantial, with over 20% of the animals dying during the first 3 years, but generally fewer per annum thereafter.

The "wheelbarrow test" is a practical method of testing for OPA. This involves lifting the hind end and lowering the head causing anything from a few drops up to $\frac{3}{4}$ pint (425 ml) of frothy mucus to run from the nostrils. It is important to note that fluid production is not observed in all OPA cases.



Microscopic lesions of OPA x 250 close-up: The OPA tumour cells grow to fill the air spaces so that lung function is lost.



Lungs from a late stage case of OPA. The large dark areas are solid OPA tumour. Normal lungs are much smaller and softer.

● Treatment and control

There is no treatment for affected animals, nor a vaccine to prevent infection. The current control strategy is the regular inspection of adult sheep with removal and culling of affected animals and their offspring. Nasal discharge of clinical cases is rich in virus and most likely a major source of infection. As there is no effective cure, at present affected farms must learn to live with the disease. Optimal feeding and housing conditions will keep the general health status high and reduce losses due to OPA.

Ways to prevent an introduction of OPA are the same as for every other infectious disease. Contact with sheep of other flocks should be kept to a minimum and new animals should only be bought from trusted sources.

Flock specific control measures should be discussed with your veterinarian.

● What is being done about it?

Moredun Research Institute, SAC and BioSS are working together on an epidemiological study investigating the spread of OPA in Scotland. Ongoing research work at Moredun also aims to develop practical diagnostic tests and a vaccine. This work is funded by the Scottish Executive Environment and Rural Affairs Department (SEERAD).



Moredun

For further information please contact:

Dr Chris Cousens, Virology Division,
Moredun Research Institute, Pentlands Science Park, Bush Loan,
Penicuik, EH26 0PZ, Scotland, UK.

Tel: +44 (0)131 445 5111 Fax: +44 (0)131 445 6111
email: chris.cousens@moredun.ac.uk

www.moredun.ac.uk