

# African Swine Fever

## Images to show clinical signs and pathology

The following series of images have been provided by The Pirbright Institute to assist in the recognition of disease due to African swine fever (ASF) in pigs

These are from a controlled animal study where pigs were infected with virulent ASF virus, similar to the virus that has been spreading in Eastern and Central Europe

Compiled by Dr Linda Dixon (The Pirbright Institute) and Dr Susanna Williamson (APHA)

# African swine fever - Clinical signs

## Clinical signs:

- Likely to be peracute or acute in presentation
- Can start to show from two to three days after infection, even with a quite low virus dose, but can take 15 days to develop with very low virus doses
- High fever ( $>41^{\circ}\text{C}$ ), dullness and loss of appetite
- Huddling and reluctance to move
- Red-purple skin discolouration especially extremities (e.g. ears) and ventral body and, sometimes, haemorrhages but pigs may die without external signs of haemorrhage
- Death

The following signs are more variable and not present in all pigs or in all groups of pigs:

- Gastrointestinal - vomiting and diarrhoea/dysentery (bloody diarrhoea)
- Nervous signs - ataxia
- Other - oculonasal discharges, epistaxis, dyspnoea, coughing
- Reproductive effects (breeding herds) - abortion

## African swine fever - Clinical signs

It is important to note that spread of ASF by pig to pig contact can be slower than some other diseases. If infection is first introduced into just one or two pigs in a group, deaths may initially only involve those one or two pigs until ASF virus has spread to infect larger numbers of pigs which can take one to two weeks, after which increasing mortality is seen. This slower spread is associated with minimal transmission by aerosol, the fact that virus shedding does not start before clinical signs appear, and relatively low amounts of virus in excretions and secretions from infected pigs. Note that there are very high amounts of virus in blood and tissues of affected pigs. Thus contact or consumption of carcasses of pigs or wild boar or their products is an efficient method of transmission.

## **African swine fever is a notifiable disease**

**If the clinical signs and/or post-mortem findings in pigs are suspicious of a notifiable disease you must report it immediately by calling:**

**In England: Defra Rural Services Helpline on 03000 200 301**

**In Wales: APHA on 0300 303 8268**

**In Scotland: contact the local APHA [Field Services Office](#)**

**An investigation will then take place**

# African swine fever - clinical signs



Pigs huddling together six days after infection with virulent African swine fever virus. Pigs have very high temperatures (over 41°C), are lethargic and have lost their appetite, either not eating or picking at food. One pig on the left shows reddening of the pinnae of the ears.  
Credit: The Pirbright Institute

## African swine fever - clinical signs



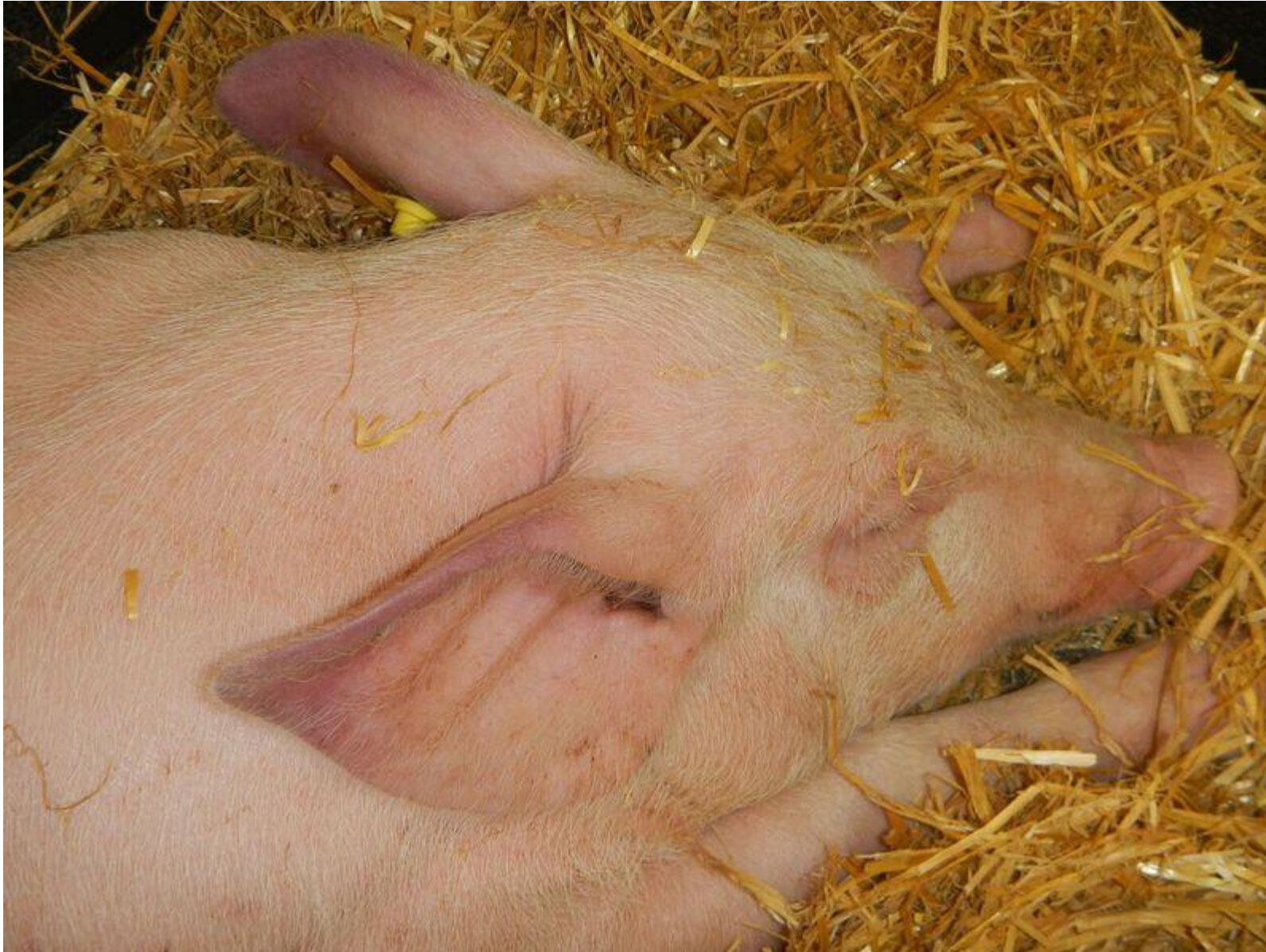
Pigs after infection with virulent African swine fever virus. Pigs have very high temperatures (over 41°C), are lethargic and do not want to move, and have lost their appetite.  
Credit: The Pirbright Institute

## African swine fever - clinical signs



Pigs after infection with virulent African swine fever virus. Pigs have very high temperatures (over 41°C), are lethargic and do not want to move, and have lost their appetite. There is conjunctivitis and reddening of the ears in these pigs. Credit: The Pirbright Institute

# African swine fever - clinical signs



Pig after infection with virulent African swine fever virus. This pig has a very high temperature (over 41°C), is lethargic and does not want to move, and has lost its appetite. There is reddening of the ears. Credit: The Pirbright Institute



# African swine fever - clinical signs



Pig seven days after infection with virulent ASFV with a very high temperature (over 41°C). This pig is very reluctant to get up, depressed and has lost its appetite. Blotchy reddening of the ears pinnae is visible.  
Credit: The Pirbright Institute

# African swine fever - clinical signs



Pig seven days after infection with virulent ASFV with a very high temperature (over 41°C). This pig is reluctant to get up, depressed and has lost its appetite. Reddening of the ear pinna is observed in this pig. Credit: The Pirbright Institute

# African swine fever - clinical signs



Pigs infected with virulent ASFV can display skin redness and cyanotic areas (tip of ears, distal limbs, tail, perianal area, chest and abdomen). This pig has reddened ears, conjunctivitis and had a high temperature (over 41°C).

Credit: The Pirbright Institute

# African swine fever - clinical signs



Pigs infected with virulent ASFV can show conjunctivitis with reddening of the conjunctival mucosa and ocular discharges. This pig also had a high temperature (over 41°C).  
Credit: The Pirbright Institute

# African swine fever - clinical signs

In pigs infected with virulent ASFV, bloody diarrhoea (dysentery) is occasionally observed. Credit: The Pirbright Institute



# African swine fever - clinical signs

Pigs infected with virulent ASFV can display skin redness and cyanotic areas (tip of ears, distal limbs, tail, perianal area, chest and abdomen). This pig has reddening of the skin of the ventral body and scrotum. It also had a high temperature (over 41°C). Credit: The Pirbright Institute



## African swine fever – Gross pathology

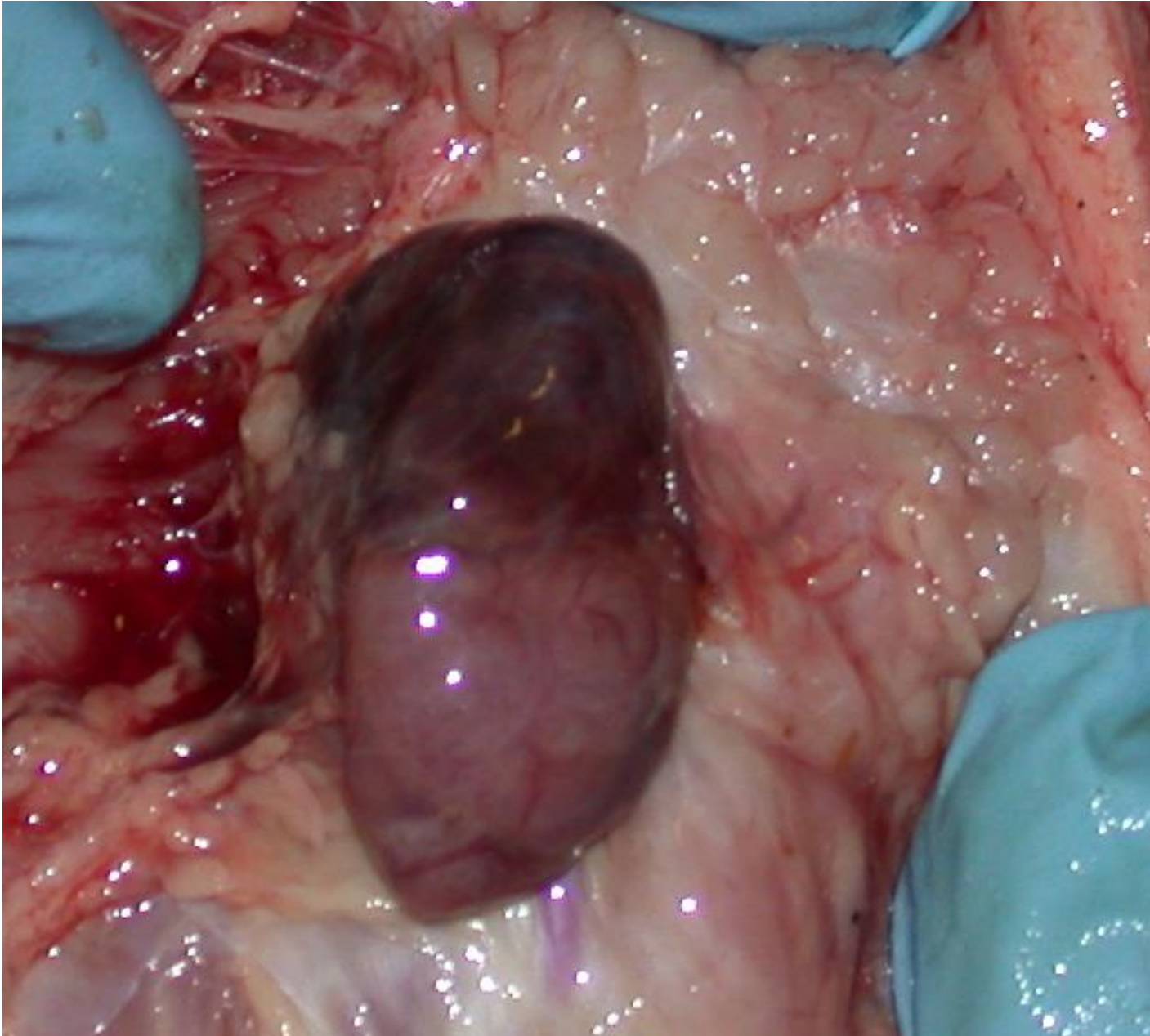
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### Post Mortem lesions:

- Variable and not all are present in each pig or in all groups of pigs:
- Haemorrhages – skin, lymph nodes, kidney (cortex - strip off capsule, “turkey-egg” kidney), bladder, larynx, heart, lung, liver, serosal & mucosal surfaces
- Enlarged, reddened (almost black) lymph nodes
- Spleen enlarged, dark and more friable
- Blood-stained effusions in pericardium, abdomen and thorax

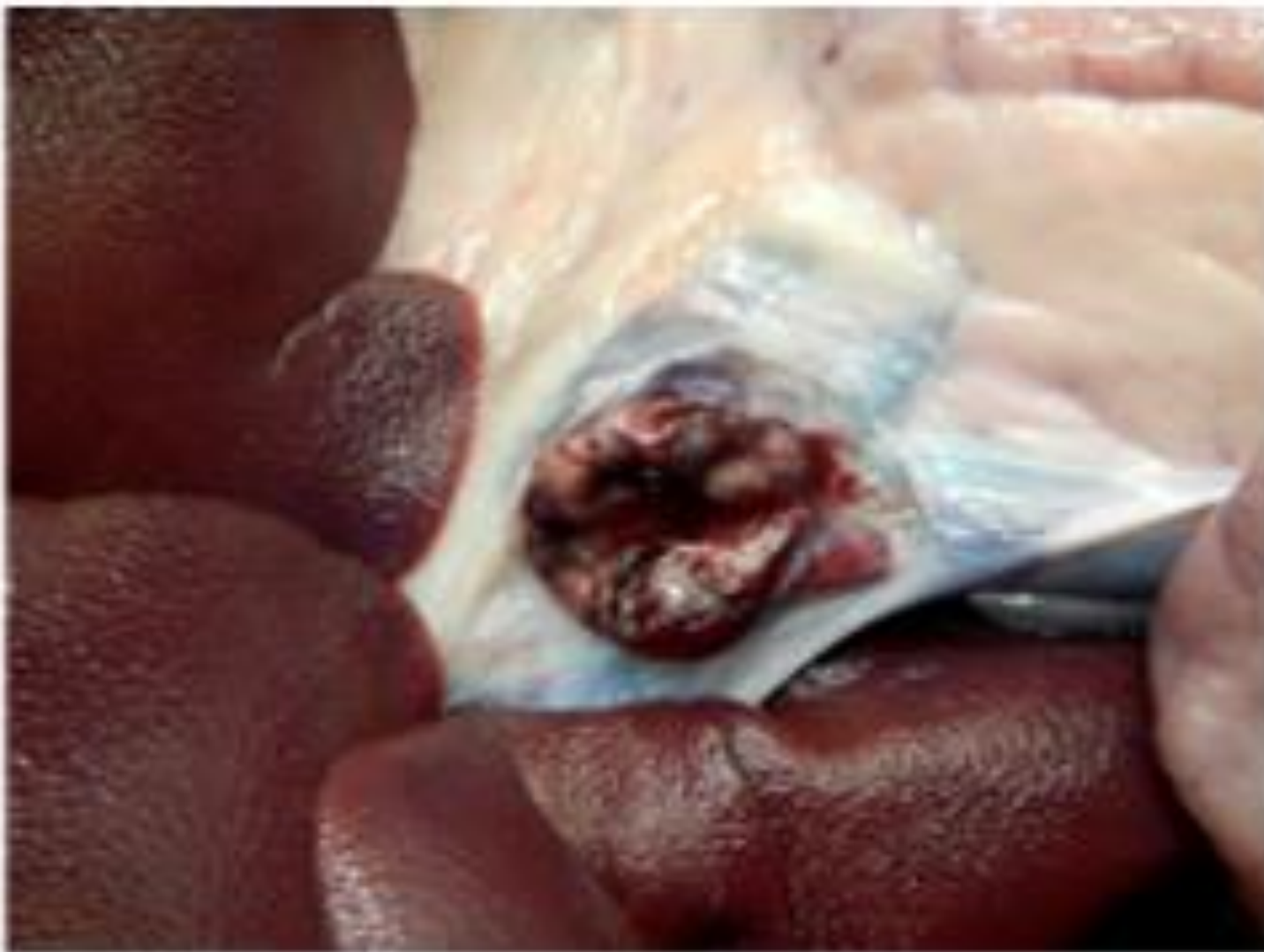
# African swine fever - pathology



An enlarged and partially haemorrhagic gastrohepatic lymph node in a pig affected by ASF. At later stages of disease the haemorrhagic area increases and the lymph node becomes almost black. Tracheo-bronchial lymph nodes are often nearly black. Credit: The Pirbright Institute



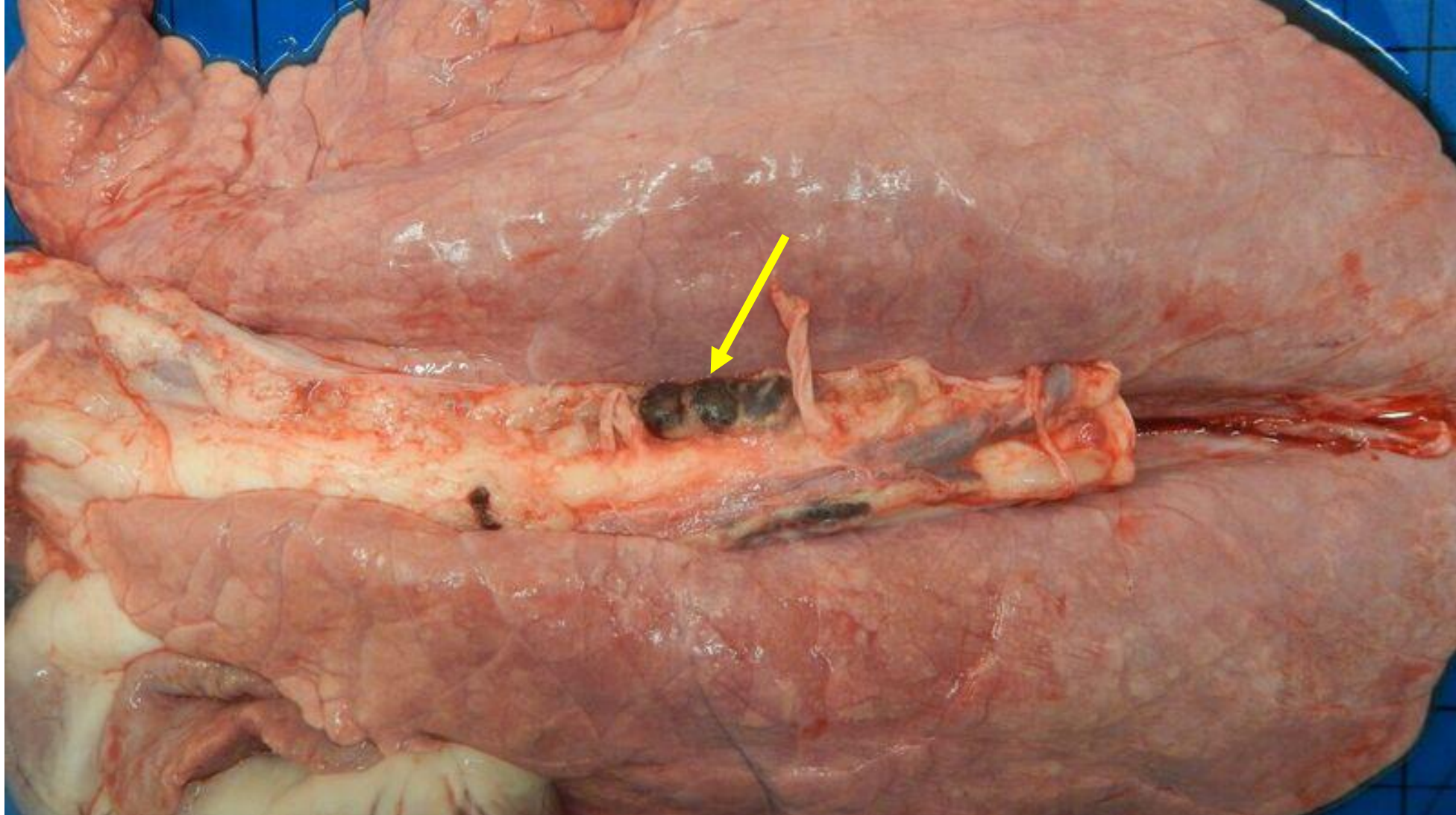
## African swine fever - pathology



Greatly enlarged and haemorrhagic lymph nodes are commonly observed in pigs infected with acute ASF, this involves lymph nodes at many different sites. The lymph nodes can become almost black in colour. Here an incised gastro-hepatic lymph node is shown in the centre of the image. Credit: The Pirbright Institute

# African swine fever - pathology

Lungs and enlarged dark (haemorrhagic) lymph nodes (arrowed) in a pig affected by ASF. Credit: The Pirbright Institute

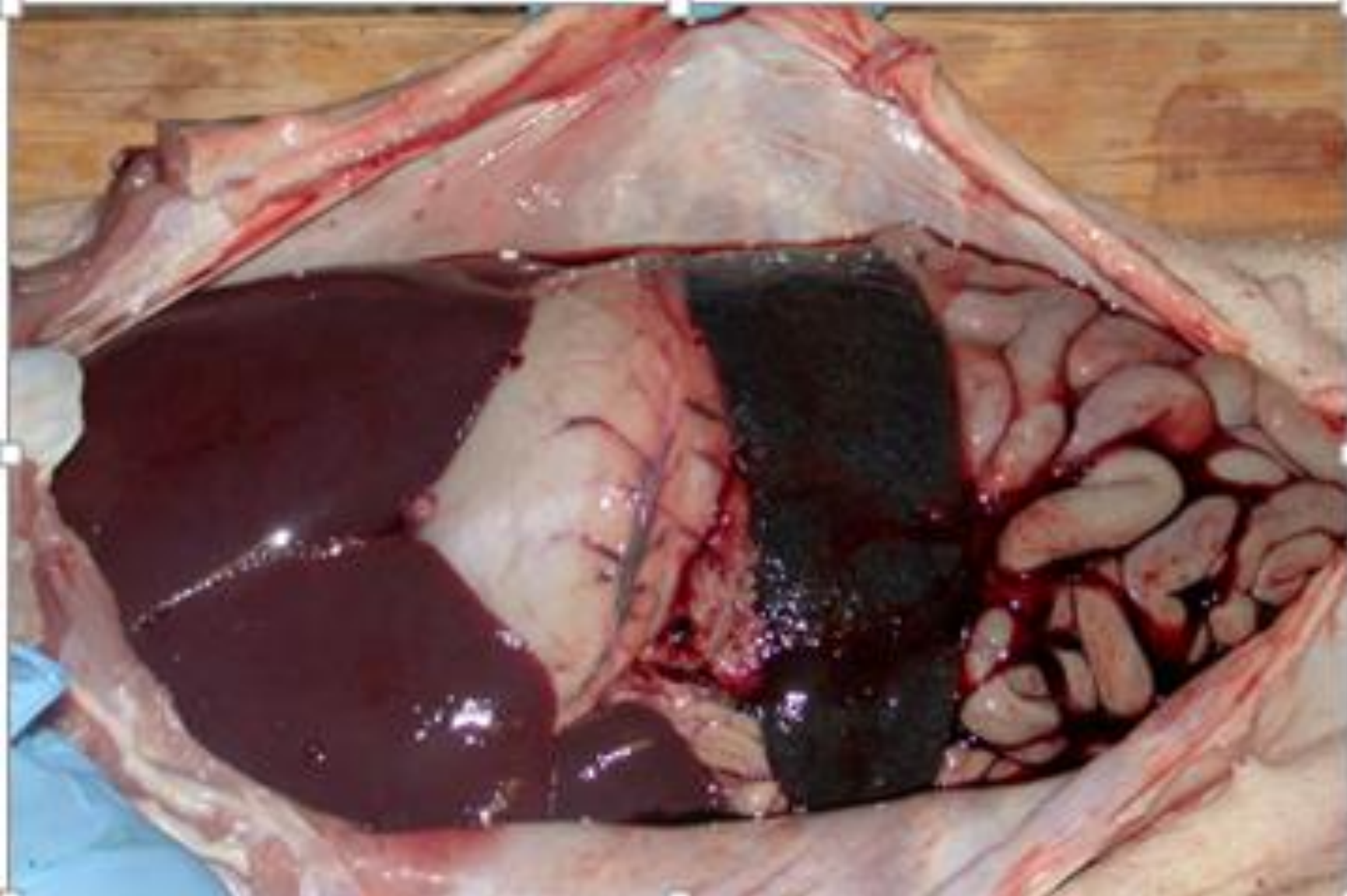


# African swine fever - pathology



Pigs infected with acute ASFV can develop haemorrhagic gastritis as shown in this image. Credit: The Pirbright Institute

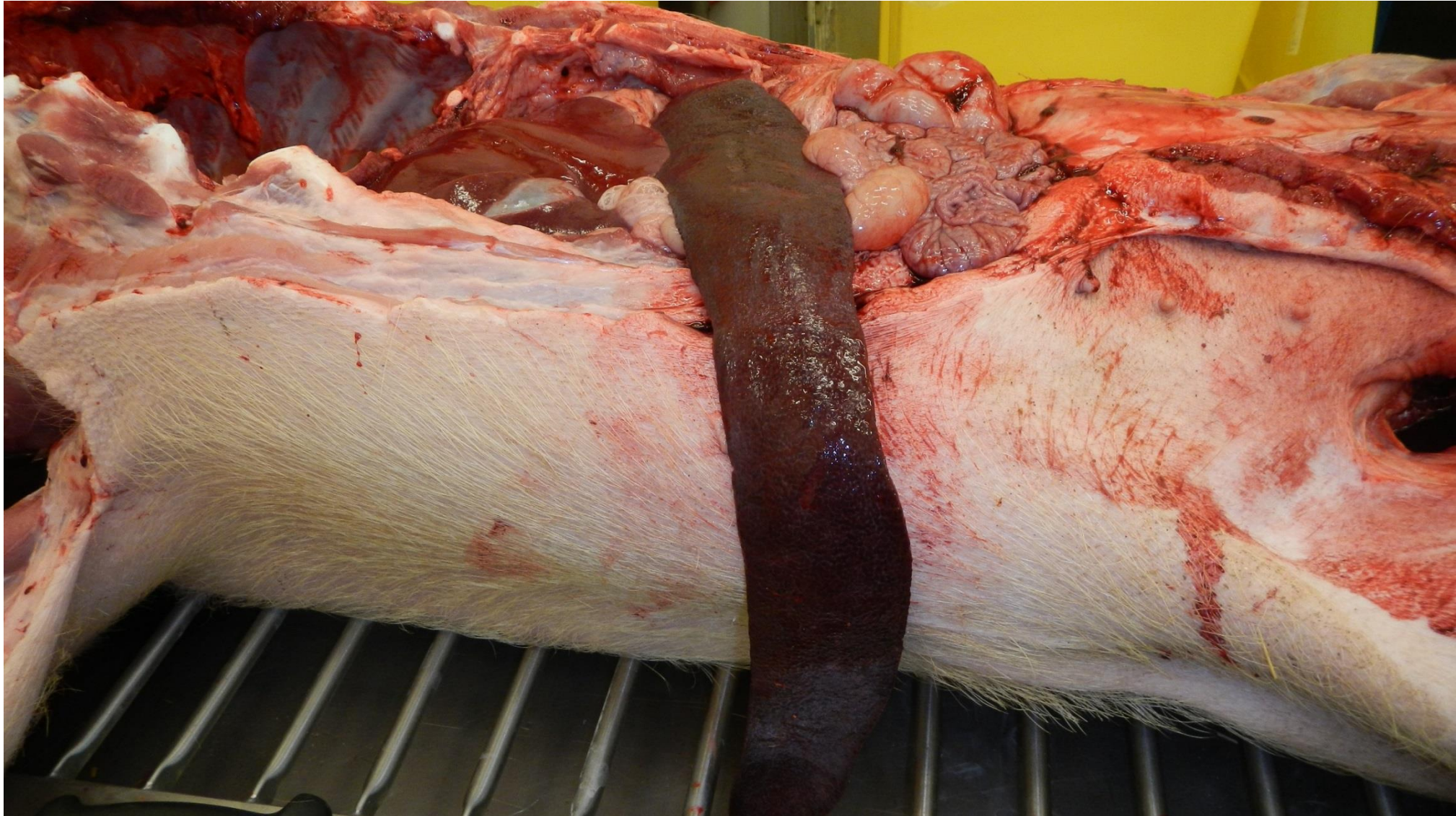
## African swine fever - pathology



Typical of acute ASF is the very enlarged and haemorrhagic spleen which is almost black in colour as shown here. Credit: The Pirbright Institute

# African swine fever - pathology

This shows a typical finding in acute ASF of a very enlarged and haemorrhagic spleen Credit: The Pirbright Institute



# African swine fever - pathology

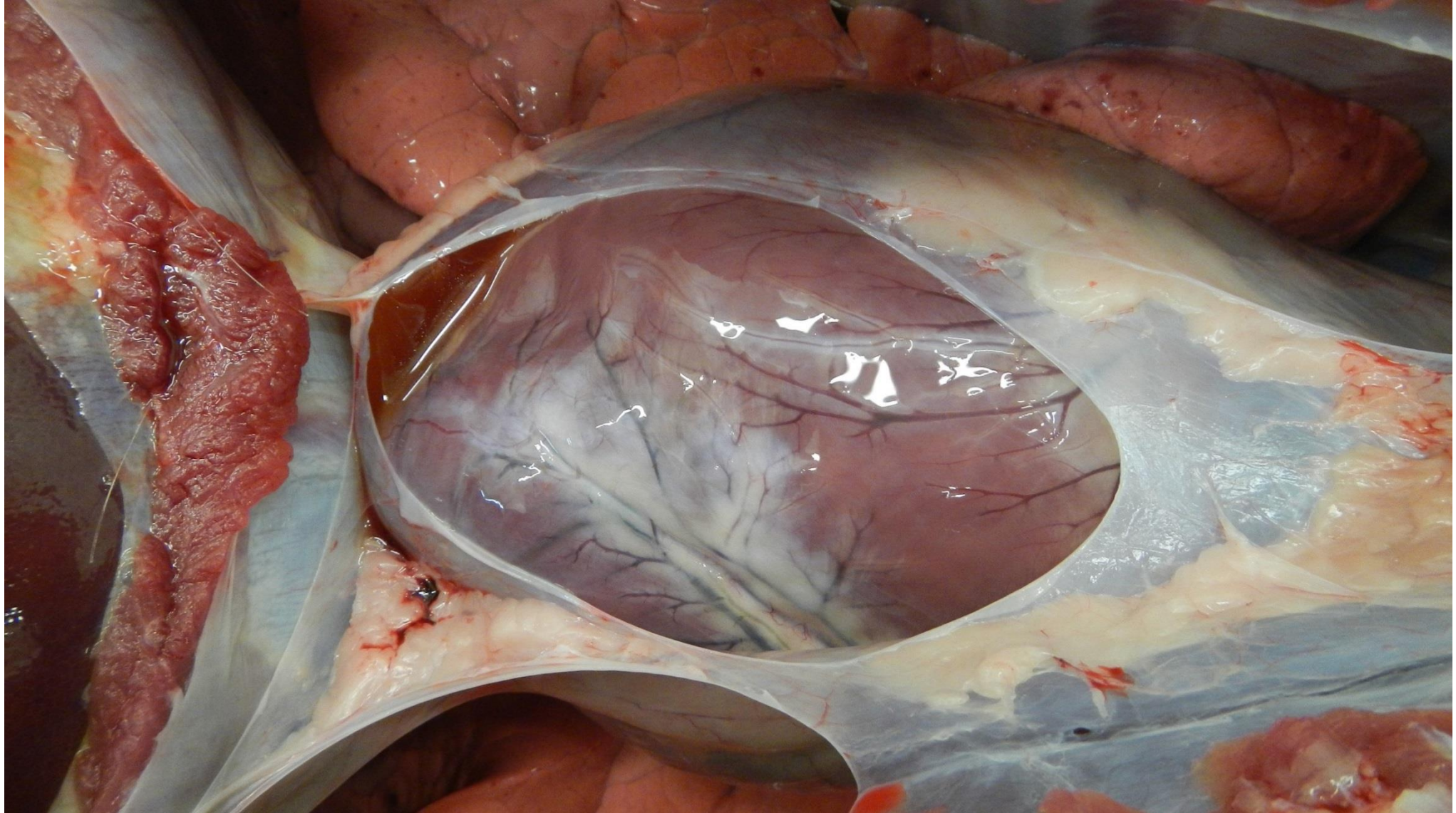


Excess yellow peritoneal and other body cavity fluids are common in pigs affected with acute ASF. The very dark and enlarged spleen can also be seen.

Credit: The Pirbright Institute

# African swine fever - pathology

Excess yellow pericardial and other body cavity fluids are common in pigs affected with acute ASF. Credit: The Pirbright Institute



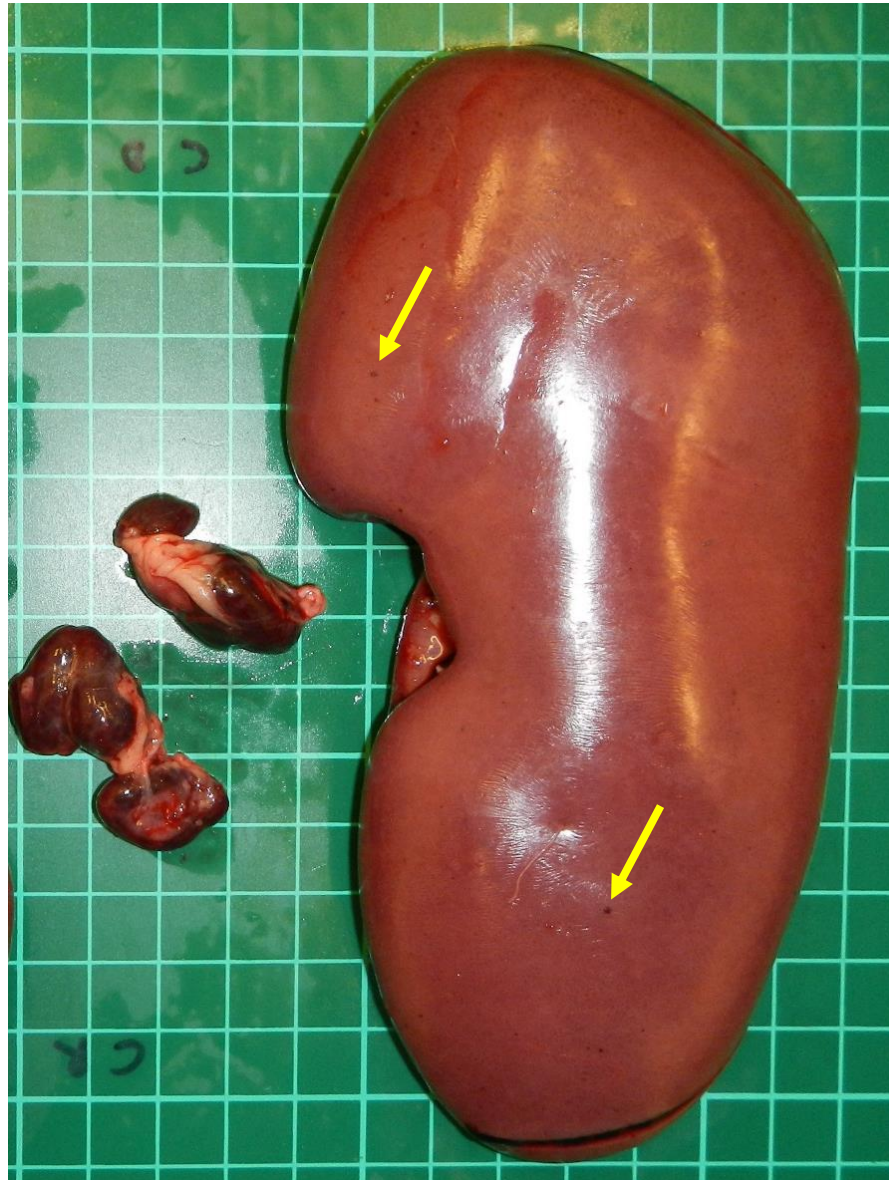
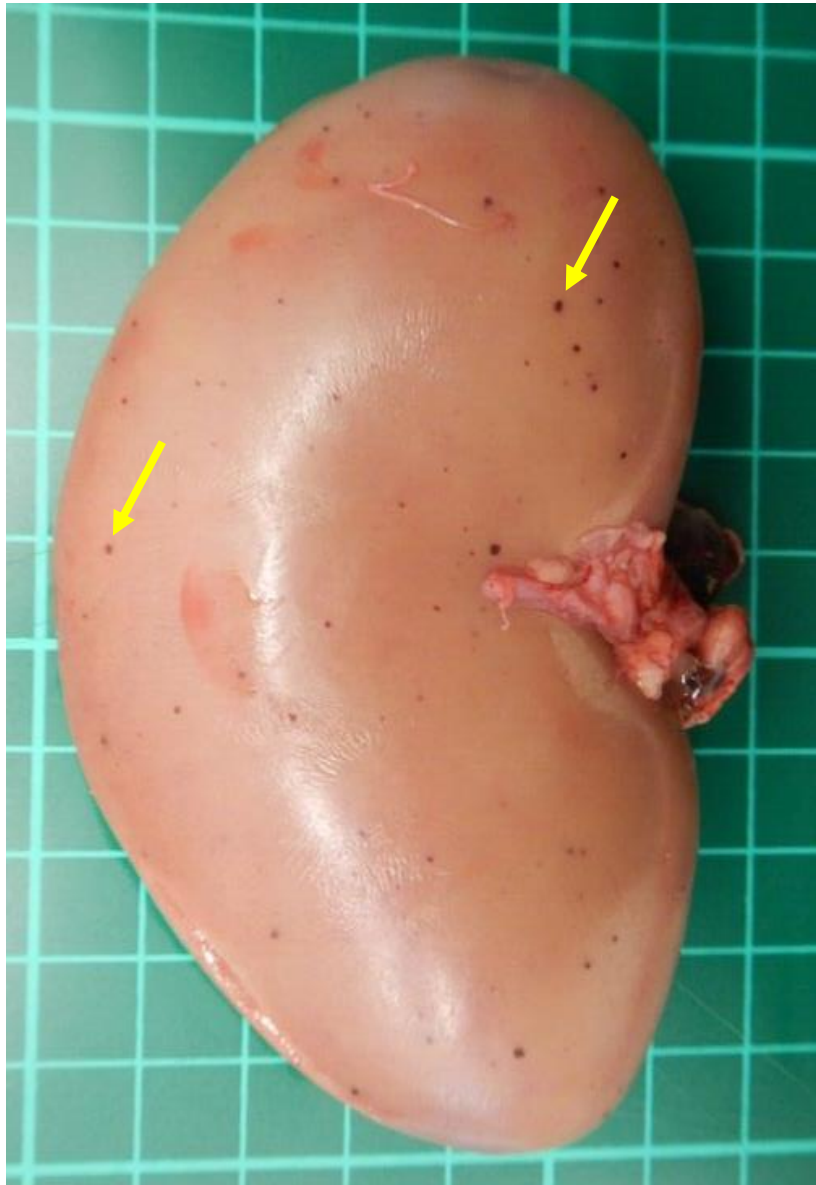
# African swine fever - pathology



Kidneys from pigs showing signs of acute ASF. Kidney on the right shows more marked multiple haemorrhages over the cortex. Haemorrhages may be less marked as shown on the left. The kidney capsule must be stripped off to look for these lesions.  
Credit: The Pirbright Institute



# African swine fever - pathology



On the right are enlarged haemorrhagic renal lymph nodes next to a kidney from the same pig affected with acute ASF. Scattered subtle haemorrhages are indicated by arrows. On the left is a paler kidney from a different pig with scattered haemorrhagic lesions (arrowed). The kidney capsule must be stripped off to look for these lesions. Credit: The Pirbright Institute

# Purpose, ethical review and biocontainment of experimental infections

The experimental infections of pigs with African swine fever virus (ASFV) were carried out at The Pirbright Institute as part of essential research to help in the diagnosis and control of ASF in pigs and in particular to:

- Develop effective vaccines for ASFV since none exist
- Investigate the pathogenesis and transmission of ASF and model disease spread
- Provide control samples for evaluation of diagnostic tests

## Ethical review and biocontainment:

- Animals are used in research only when no non-animal alternatives are available, and when they are used it is regulated by the Animals (Scientific Procedures) Act 1986 (ASPA). To meet the ASPA requirements there are strict requirements of ethical review and licencing. Details of how Pirbright met these requirements are at [Animal research at Pirbright | The Pirbright Institute](#)
- The experimental infections were also licensed by the Health and Safety Executive (HSE) under the Specified Animal Pathogens Order and carried out in level 4 biocontainment large animal facilities

**Further information:** Take a virtual tour of The Pirbright Institute's animal facilities and hear more about ASF research through [www.labanimaltour.org](http://www.labanimaltour.org)

- The organisation Understanding Animal Research provides information based on research and an understanding of the historical and scientific facts [www.understandinganimalresearch.org.uk](http://www.understandinganimalresearch.org.uk)
- If you have any questions regarding the use of animals in research at The Pirbright Institute, please email [animal.research@pirbright.ac.uk](mailto:animal.research@pirbright.ac.uk)