African swine fever (ASF)

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Introduction

The virus that causes this disease is physically and behaviourally unique in many respects but only the introduction of domestic pigs to Africa by European missionaries and settlers starting several centuries ago revealed its pathogenic potential. Prior to that, the virus had existed in an underground commensal relationship with warthogs and argasid ticks that live in their burrows and feed on their blood. ASF was first reported as a disease distinct from classical swine fever in Kenya in 1921, followed shortly by Angola and South Africa. However, in the last 50-60 years the virus has shown a remarkable ability to infect pigs and has invaded many other parts of the world.

Salient features of ASF

ASF is a highly contagious viral haemorrhagic fever of domestic pigs that can kill up to 100% of affected animals. It is caused by a unique DNA virus, Asfivirus, which is the only known member of its family (Asfarviridae). Its natural hosts are wild African pigs, in particular warthogs, and argasid (soft) ticks of the Ornithodoros moubata complex that live in their burrows and are responsible for transmitting the virus from warthogs to domestic pigs. ASF is therefore unusual in being both a highly contagious and a vector-borne disease, and in the fact that ASF virus is the only known biologically-transmitted DNA arbovirus (=arthropod-borne virus). Only members of the Suidae (pig family) are susceptible to infection. African wild pigs (warthogs, bush pigs and giant forest hogs) have an inherent resistance to the pathogenic effects of the virus and do not develop disease, but most domestic pigs and their ancestor, the Eurasian wild boar, develop serious, usually fatal disease. In spite of more than half a century of research, which only yielded vaccines that retained too much pathogenicity to be made available, there is no vaccine against ASF.

Where does ASF occur?

ASF virus is endemic to sub-Saharan Africa, where it is a major constraint for pig production and prevents pigs from fully realizing their high potential to generate income for the people who produce them. Owing to its high propensity for transboundary spread, which is largely due to the ability of the virus to persist in the meat of infected pigs, outbreaks of ASF have occurred in Europe, the Caribbean, Brazil, and the Caucasus (Georgia, Armenia, Azerbaijan, south-western Russia). It is currently widespread in Africa in countries where pigs are produced, including Madagascar, endemic in the Italian island of Sardinia, and has not been eradicated from Russia.
What triggers an outbreak of ASF?

There are several ways in which domestic pigs may become infected with ASF virus:

In parts of East and southern Africa where warthogs are infected, domestic pigs can be infected by *Ornithodoros* ticks feeding on their blood. Once a domestic pig is infected, it sheds enormous amounts of virus. Thereafter the most common ways for pigs to become infected are:

- Direct contact with infected pigs
- Contact with objects contaminated with the secretions, excretions or blood of infected pigs (footwear, equipment, clothing, etc)
- Eating the flesh of pigs that have died of ASF either by scavenging the carcasses of the pigs or by being fed swill that contains uncooked or under-cooked pork derived from infected pigs.
- In some places *Ornithodoros* ticks live in pig sties and in parts of Africa a cycle has developed between them and the pigs they feed on, with the ticks serving as long-term hosts of the virus.

Prevention and control

Prevention of ASF is very important because once an outbreak occurs it becomes difficult and sometimes impossible to control. Losses can be very heavy due to high mortality and drastic control measures involving the killing and disposal of all infected and in-contact pigs that cause far higher mortality than the disease itself. Good biosecurity measures that prevent contact between pigs and the sources of virus described above will protect the pigs and avoid outbreaks that have devastating effects such as:

- Loss of income and a threat to food security in poor communities
- Local and international bans on trade in pigs and pork
- Loss of livelihoods and jobs in small and industrialized pig industries

Find out more

The CPD module on ASF describes the complicated epidemiology of ASF, how to recognise it and confirm the diagnosis, its remarkable potential for transboundary spread, the effects it has had on pig production in Africa and other parts of the world and why it is regarded as a re-emerging disease, the reasons why conventional control measures can fail, and the on-farm biosecurity measures needed to prevent it.

Other relevant CPD courses

- Classical swine fever
- Biosecurity