

A case study on African swine fever in North East India

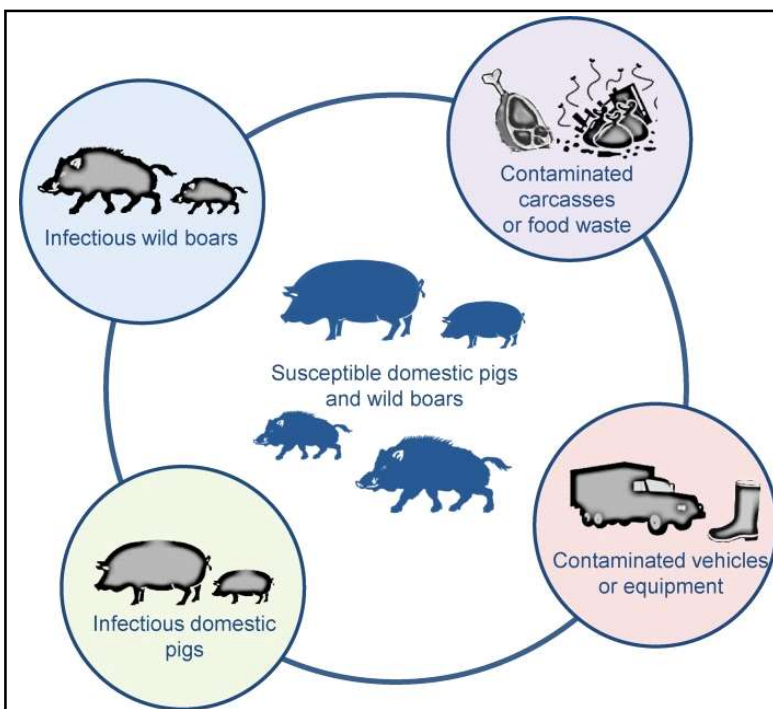
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History : African swine fever (ASF) is a highly contagious viral disease of swine which causes high mortality, approaching 100%, in domestic pigs. After ASF was originally identified in Kenya in 1921, the first outbreak was later determined to have happened in 1907. Up until 1957, when it was discovered in Lisbon, Portugal, the disease was only found in Africa, Portugal saw another outbreak in 1960. Following these first introductions the illness thorough out Europe, becoming established on the Iberian Peninsula and occasionally breaking out in France, Belgium and other nations in the 1980s. By the middle of the 1990s, the disease had been wiped out in Spain and Portugal thanks to a slaughter programme. African swine fever is a



highly contagious and deadly viral disease affecting both domestic and feral swine of all ages. ASF is not a threat to human health and cannot be transmitted from pigs to humans. It is not a food safety issue. ASF is found in countries around the world. More recently, it has spread to the Dominican Republic and Haiti. ASF has also spread through China, Mongolia and Vietnam, as well as within parts of the European Union. It has never been found in the United States – and we want to keep it that way.

ASF is a devastating, deadly disease that would have a significant impact on U.S. livestock producers, their

communities and the economy if it were found here. There is no treatment or vaccine available for this disease. The only way to stop this disease is to depopulate all affected or exposed swine herds.

Etiology: Iridovirus is the causal agent of the viral disease known as African swine fever. Due to its upto 95-100% mortality rate and the management measures put in place by afflicted countries, African swine fever, a highly contagious hemorrhagic viral illness of domestic and wild pigs, causes significant production and economic losses. A DNA virus belonging to the Ansfarviridae family is the culprit. Classical swine fever and African swine fever are two distinct illnesses with comparable signs and

symptoms.

On April 29, 2020, Assam and Arunachal Pradesh in India reported the first case of African swine flu that year. In August 2018, it first affected China, then Southeast Asian nations like Vietnam, Myanmar, South Korea, etc. According to a study released in the National Center for Biotechnology Information in October 2020, India became the 30th nation to experience this disease for the first time in May 2020. ASF is caused by a virus that is not linked to the CSF virus and has a more complex genetic makeup. While the RNA virus causes CSF and the DNA virus

causes ASF, respectively According to Dr. Aksay Kesari, the district veterinary officer in Sivasagar, Assam. He continued by saying that ASF has a higher fatality rate than CSF. The rapid and widespread death of pigs is a sign of this transboundary animal disease (TAD). While recovered pigs may also operate as a carrier, the disease can be directly transferred by live or dead pigs through blood, tissues, secretions and excretions. Additionally, contaminated feed and fomites (items that are not living things) can transmit it likely carry infection such as clothing, footwear, automobiles, knives and other items that could potentially spread infection. In various contaminated materials, the virus can stay active for upto three years. Additionally, the incubation phase lasts from 4 to 19 days.

Current situation : Classical swine fever and African swine fever are two distinct illnesses with comparable signs and symptoms. “The virus that causes ASF is unrelated to the virus that causes CSF and has a more intricate genetic makeup. While the RNA virus causes CSF and the DNA virus causes ASF, respectively “According to Dr. Aksay Kesari, the district veterinary officer in Sivasagar, Assam. He continued by saying that ASF has a higher fatality rate than CSF. The first suspicious pig death in Mizoram was discovered on March 21, 2021 in the Lungsen village of the Lunglei district. A sample was sent to the National Institute of High Security Animal Diseases (NIHSAD) of the Indian Council of Agricultural Research, Bhopal, where it was tested and found to have ASF on April 15, 2021 According to Dr. Lalhming thanga, Joint Director (Livestock Health), Mizoram’s Department of Animal Husbandry and Veterinary. African swine flu cases were confirmed in the districts of Dimapur and Kohima on Friday by the Nagaland animal husbandry and veterinary services department. According to the report, the sickness has so far spread to seven regions in the state. Through RT-PCR from NERDDL, Guwahati, positive cases of African swine fever have been verified in Meriema, Viswema and Dzulakie villages in Kohima, Unity Colony at Purana Bazar and Bamunpukhuri Colony in Dimapur, according to the directorate of animal husbandry and veterinary services department.

According to a 2019 study published in the International Journal of Current Microbiology and Applied Sciences, pork is the most consumed meat worldwide even though poultry consumption is growing quickly. Assam has the most pigs (1.63 million), followed by Uttar Pradesh (1.33 million), Jharkhand (0.96 million), Bihar (0.65 million), and West Bengal (0.65 million) in terms of population (0.65

million). The north-eastern region is where the consumption is concentrated. The north eastern states share their boundaries with neighboring countries where ASF was already reported, like Myanmar and China he explained. Another reason could be unrestricted movement without checking health records of piglets along the borders of Myanmar, Bangladesh and Tibet. The cause of this virus is thought to be the unlawful movement of, according to Dr. Lalhmingthanga pigs from neighboring countries. “Mizoram shares its boundaries with Myanmar and Bangladesh and there were reports of illegal movement of pigs from these countries.

In 2020 and 2021, the Sivasagar district of Assam alone reported three ASF outbreaks. “Our district saw almost 2,700 deaths that were officially reported. However, there were also about 5,000 pig deaths that were unreported “Dr. Kesari noted. Additionally, the incubation phase lasts from 4 to 19 days. In mainland Italy, there has only ever been one case of ASF reported. Additionally, a backyard plot close to the Bulgarian border has been found to contain the disease for the first time in North Macedonia. Since the first domestic case was announced in July 2021, Germany has already discovered four instances of ASF in domestic pigs. In other places, such as Moldova, Romania, Russia and Ukraine, recurring epidemics in domestic pigs are still being documented. ASF has also been reported in wild boar across the globe Europe. Several nations in Eastern Europe and Asia, including China, Hong Kong, Mongolia, Vietnam, India, and North Korea, have also been found to have the disease. In affected areas the disease has been confirmed in wild boar, as well as on farms, smallholdings and in pet pigs.

Disease transmitted : This transboundary animal disease (TAD) is identified by the sudden and mass death of pigs. While it can be directly transmitted by live or dead pigs through blood, tissues, secretions and excretions, recovered pigs may also act as a carrier. It can also spread via contaminated feed and fomites (non-living objects that likely carry infection) such as clothes, shoes, vehicles, knives and other equipment. The virus can remain active up to three years in different contaminated materials.

- Direct contact with infected pigs, faces or body fluids.
- Indirect contact via fomites such as equipment, vehicles or people who work with pigs between pig farms with ineffective biosecurity.
- Pigs eating infected pig meat or meat products.
- Biological vectors - ticks of the species



Ornithodoros. However, ASF-competent ticks are not present in the UK.

Clinical signs : ASF clinical symptoms can manifest in chronic, subacute, or acute stages. ASF has a variable incubation time, however, it typically lasts between five and fifteen days. Pigs with the acute version of the disease reach a high body temperature (40.5 C or 105 F), after which they get drowsy and stop eating. Although they can vary, other signs may include some or all of the following:

- Vomiting.
- Constipation (sometimes bloody).
- Reddening or darkening of the skin, especially on the nose and ears.
- Clogged eyes.
- Sputum production and labored breathing.
- Lackluster litters, stillbirths and abortion.
- Weakness and a refusal to stand.
- Red patches of the skin on the ears, abdomen, chest, tail and hind legs which may turn into bluish purple colour

at later stages.

– Some pigs can show conjunctivitis with reddening of the conjunctiva mucosa and ocular discharges.

The clinical symptoms of ASF are identical to those of classical swine fever and also resemble those of Porcine Dermatitis and Neopathy Syndrome, two other pig illnesses.

Prevention and control : Good biosecurity is essential to the prevention of introduction of ASF into Northern Ireland. Procedures or measures designed to protect the population against harmful biological or biochemical substances.

- Maintain strict biosecurity.
- Only allow essential visitors to enter your farm, and insist that they wear clean or disposable clothing and footwear and wash their hands (or shower in if possible).
- Erection of physical barriers 50 metres around pig enclosures to keep off visitors, cars and advisors equipments and surgeons, farm attendants, etc.
- Liming of pasture and keeping it parasite free.



- Proper sanitation in house (dry floor, well ventilation and good lighting arrangement).
- Proper disposal of infected litter and carcass.
- Only allow vehicles and equipment on to the farm if they have been cleaned and disinfected beforehand.
- Do not allow people who may have been in contact with other pigs on to your farm.
- Do not allow staff and visitors to bring pork products on to the farm.
- Do not allow catering waste / scraps to be fed to pigs - dispose of it safely.
- Only source pigs and semen of known health status.

Treatment : No effective treatment or vaccine. There is no treatment for ASF and attempts to develop a vaccine are ongoing. Many laboratories around the world are working to develop a vaccine, with some promising results, but more work is required to ensure the safety and efficacy of these prototype vaccines before registration.

Conclusion : ASF is caused by a large, double stranded DNA virus, ASF virus (ASFV), which replicates predominantly in the cytoplasm of macrophages and is the only member of the *Asfarviridae* family, genus *Asfivirus*. The natural hosts of this virus include wild suids and arthropod vectors of the *Ornithodoros* genus. The infection of ASFV in its reservoir hosts is usually asymptomatic and develops a persistent infection. In contrast, infection of domestic pigs leads to a lethal hemorrhagic fever for which there is no effective vaccine. Identification of ASFV genes involved in virulence and the characterization of mechanisms used by the virus to evade the immune response of the host are recognized as critical steps in the development of a vaccine. Moreover, the interplay of the viral products with host pathways, which are relevant for virus replication, provides the basic information needed for the identification of potential targets for the development of intervention strategies against this disease.

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