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Popular Article

African swine fever (ASF): A silent menace to pig industry of North Eastern states

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Abstract

Pigs are an integral part of people's livelihoods in Northeast India, serving as a primary source of income, nutrition and cultural significance. However, the outbreak of African Swine Fever (ASF) has severely impacted pig farming in the region. First reported in Assam in 2020, ASF has since spread across multiple states, causing heavy losses due to its high mortality rate and lack of a vaccine or cure. This article explores the disease's transmission, diagnosis and economic consequences. Strengthening bio-security, promoting alternative livestock farming and advancing research on ASF vaccines are crucial steps to safeguard the pig industry.

Introduction

Pigs hold significant importance in the North Eastern states of India. They are most the populous livestock species in Manipur, Mizorum & Nagaland state and third most populous species in Arunachal Pradesh, Assam, Sikkim & Tripura (GOI, 2019). They are a crucial part of the traditional agricultural and culinary practices of the region. In many North Eastern communities, pigs are raised as a source of livelihood, providing meat and income through their sale. They also play a vital role in cultural and social ceremonies, symbolizing prosperity and abundance. However, the pig industry in the *North Eastern* states is under significant jeopardy due to the outbreak of African Swine Fever (ASF). While this deadly viral disease has been a persistent problem in various parts of the world, its

arrival on the Indian subcontinent has raised alarm. ASF is a highly contagious viral disease caused by a double-stranded DNA virus that primarily affects lymphoid tissues in domestic and wild pigs. When the virus enters a pig's body, it initially targets the tonsils and lymph nodes in the throat and respiratory tract. From there, it replicates in the lymphoid tissues, leading to a viremia (presence of virus in the bloodstream). The virus then spreads rapidly to various organs and tissues, including the spleen, lymph nodes and bone marrow, causing widespread damage and immune-suppression. Infected pigs may develop high fever, lethargy and hemorrhagic symptoms, such as internal and external bleeding. Ultimately, ASF can lead to a high mortality rate, with no specific treatment or vaccine available, making it a significant threat to the swine industry The virus is known to be lethal to swine, with mortality rates as high as 100% in some cases. ASF is not only a severe threat to animal health but also poses significant economic consequences.

The ASF virus is not known to infect humans and is not considered a public health risk, but its impact on the pork industry cannot be underestimated. The first case of ASF in India was reported in the North Eastern state of Assam in 2020. Since then, the disease has spread to various parts of the country, including states like Mizoram, Meghalaya and Arunachal Pradesh. The slow but steady expansion of ASF's geographic range has set off alarm bells among policymakers, veterinarians and the swine farming community.

Mode of Transmission

African Swine Fever (ASF) spreads primarily through direct and indirect contact between infected and susceptible pigs. Here are the key ways in which ASF can spread:

1. **Direct Contact**: Infected pigs shed the ASF virus in various bodily fluids, such as blood, saliva, urine, feces, and nasal secretions. Direct contact between infected and healthy pigs through activities like nose-to-nose contact, mating, or fighting can transmit the virus.
2. **Indirect Contact**: The virus can persist in the environment for extended periods, making indirect transmission possible. Healthy pigs can become infected when they come into contact with contaminated materials, equipment, vehicles, or feedstuffs that have been in contact with infected pigs or their secretions.
3. **Humans**: Although humans are not susceptible to ASF, they can inadvertently spread the virus through contaminated clothing, footwear, or equipment if they have been in contact with infected pigs or materials.
4. **Wild Boars and Ticks**: In some cases, wild boars can become infected and act as reservoirs for ASF. Ticks can also play a role in transmitting the virus between wild boars and domestic pigs.

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5. **Transportation**: The movement of infected pigs or contaminated vehicles can lead to the spread of ASF over longer distances. This is particularly concerning in areas with intensive pig farming or when pigs are transported across regions or countries.
6. **Feeding of Swill**: Feeding pigs with food waste or swill that contains ASF-contaminated pork products can introduce the virus to a new location.

Diagnosis

The diagnosis of ASF encompasses a blend of clinical, laboratory, and epidemiological techniques. Clinical indicators of ASF include elevated body temperature, reduced appetite, lethargy, coughing, and distinct hemorrhagic symptoms like bleeding from the nose and rectum. A post-mortem examination of deceased pigs can yield valuable insights, with characteristic findings such as enlarged and hemorrhagic lymph nodes, an enlarged spleen (splenomegaly) and hemorrhages in various organs serving as potential signs of ASF. In laboratory diagnostics, specialized methods come into play: ASF virus-specific PCR tests can identify the virus's genetic material in tissue samples, blood, or other bodily fluids with high sensitivity and specificity. Virus isolation efforts involve trying to cultivate the ASF virus from tissue samples taken from affected pigs. Antigen detection techniques such as enzyme-linked immune-sorbent assays (ELISAs) or immune-histochemistry can pinpoint ASF virus antigens in tissues. Serological tests, such as ELISAs or virus neutralization assays, can identify antibodies to the ASF virus in the bloodstream, although these are typically employed in later stages to confirm previous exposure rather than acute infection. Epidemiological investigations, which entail examining the outbreak's history, pig-to-pig contact, and potential sources of infection, contribute to the confirmation of ASF and the prevention of its further spread. While rapid on-site tests like lateral flow assays are sometimes utilized for initial screening, confirmation through more specialized laboratory methods remains essential.

Economic Impact: North Eastern states have a thriving pork industry that supports the livelihoods of many small-scale farmers and contributes significantly to the local food supply. The introduction of ASF threatens the entire swine value chain, from farmers to consumers. The economic consequences are multifaceted, including the loss of livelihoods for farmers, disruption of the pork supply chain and potential price hikes for consumers.

The Indian and state government and various stakeholders have been swift in recognizing the economic risks posed by ASF. Efforts have been made to contain the disease and minimize its impact on the economy.

Control and Prevention Measures: Containing ASF is a complex task, requiring a complex approach that includes surveillance, bio-security measures and public awareness campaigns. The Indian

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government along with state governments, in collaboration with international organizations like FAO, has taken several measures to control the spread of the disease:

1. **Culling and Quarantine:** Infected animals are culled to prevent the virus from spreading. Strict quarantine measures are imposed in affected areas to limit the movement of pigs.
2. **Bio-security:** Enhanced bio-security measures have been promoted including restrictions on the movement of live pigs and pig products, disinfection of vehicles and controlling access to pig farms.
3. **Vaccination:** Research on developing an effective ASF vaccine is ongoing, with the aim of protecting domestic swine populations. However, no widely approved vaccine is available at present.
4. **Surveillance:** Continuous monitoring and surveillance of pig populations, both domestic and wild, are essential to track the spread of the virus and identify new outbreaks promptly.
5. **Public Awareness:** Public awareness campaigns have been initiated to educate farmers and the general public about ASF's signs, symptoms, and preventive measures.

The Way Forward

While North Eastern states grapple with the challenge of ASF, it is crucial for the government, farmers and the international community to work together to combat this disease. Investments in research for an effective vaccine, strict bio-security measures and proactive surveillance are key components of an effective strategy. Moreover, it is also necessary that pig keepers also diverse the animal farming like rear goats and poultry.

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