



# TECHNICAL BULLETIN

Central Veterinary Laboratory (CVL)

Tripureswor, Kathmandu

Year II-2079

Volume 4

## African Swine Fever (ASF)

### Introduction

African swine fever (ASF) is a viral hemorrhagic disease caused by a large DNA virus belonging to the family Asfviridae with exceptionally high lethality in domestic pigs and Eurasian wild boar. Despite its limited host range and absent zoonotic potential, its socio-economic impact is very high and many stakeholders are involved. For this reason, the disease is notifiable to the World Organization for Animal Health (WOAH). In its worst-case scenario, the disease involves domestic pigs, reservoir hosts in wildlife, i.e. wild boar or other feral swine, inanimate fomites (e.g. carcasses, contaminated habitats, tools, other mechanical vectors), and competent arthropod vectors (soft ticks). Control measures rely on strict sanitary measures as neither a licensed vaccine nor any treatments are currently available. The disease has reached multiple countries across Asia, the Caribbean, Europe and the Pacific, affecting both domestic and wild pigs.

### Mode of transmission

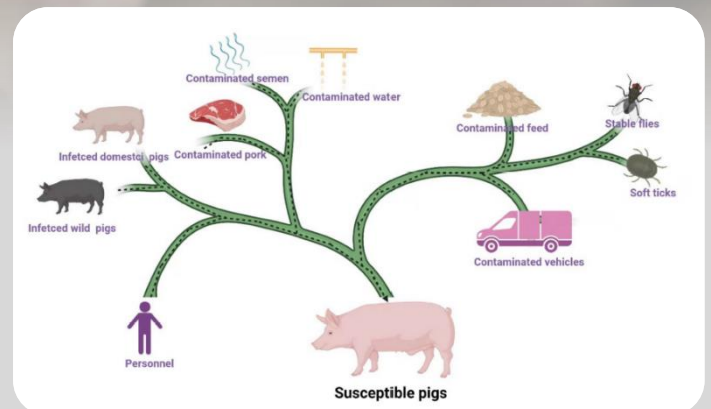


Fig. Route of transmission (Liu, Zhang et al. 2021).

### Oral Transmission

Ingesting virus-contaminated feed, drinking contaminated water, and swallowing virus particles from infectious sources are the most important routes of ASFV transmission (Liu, Zhang et al. 2021).

### Aerosol Transmission

ASFV-infected pigs shed viruses to the environment through excretions and secretions, and the virus titer in their oral fluid, nasal fluid, feces, and urine is particularly high during the acute phase (Fenner, Barthold et al. 2017).

### Insect-Borne Transmission

ASFV can be horizontally, sexually, trans-ovarially, and trans-stadially transmitted in *Ornithodoros* ticks (Liu, Zhang et al. 2021).

### Iatrogenic Transmission

ASFV may spread from virus-carrying pigs to susceptible pigs through contaminated medical equipment, such as shared immunization needles, known as iatrogenic transmission.

### Vertical Transmission

Antiabong et al. provided molecular evidence of vertical transmission of the virus. In the study, ASFV DNA was detected in the placenta and fetal organs from sows showing clinical symptoms of ASF, suggesting that vertical transmission of ASFV could occur across placenta (Antiabong, Owolodun et al. 2006).

### Clinical signs

- Fever (40.5–42°C)
- Reddening of the skin – tips of ears, tail, distal extremities, ventral aspects of chest and abdomen.



- Anorexia, listlessness, cyanosis and incoordination.
- Vomiting, diarrhoea (sometimes bloody) and eye discharges may occur

- Abortion may occur in pregnant sow
- In domestic swine, the mortality rate often approaches 100%.

### Gross lesions

- Pronounced haemorrhages in the gastrohepatic and renal lymph nodes



- Petechial haemorrhages of the renal cortex



- Congestive splenomegaly



- Hemorrhage on the heart surface

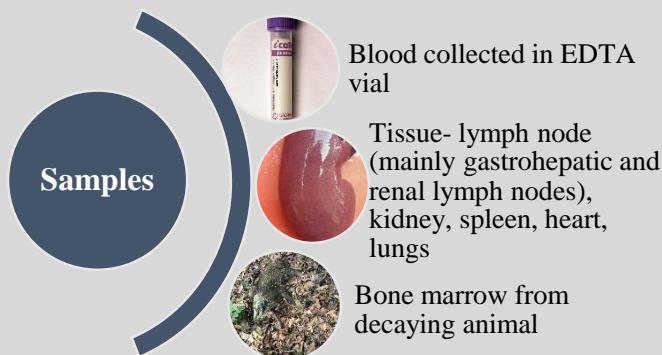


- Congested and consolidated lungs



- Cutaneous ecchymoses on the legs and abdomen
- Excess of pleural, pericardial and/or peritoneal fluid
- Petechiae in the mucous membranes of the larynx and bladder, and on visceral surfaces of organs

### Samples for laboratory diagnosis



### Laboratory diagnosis available in CVL

- Rapid Antigen detection
- Antibody ELISA
- RT-PCR

### Differential diagnosis

- Classical swine fever (CSF or hog cholera) - not possible to differentiate ASF and CSF by clinical or post-mortem examination; needs laboratory confirmation
- Porcine reproductive and respiratory syndrome (PRRS)
- Erysipelas
- Salmonellosis
- Aujeszky's disease (or pseudorabies) (younger swine)
- Pasteurellosis

### Situation of ASF in Nepal

The first suspected cases of ASF were noticed in swine as of April 2022 in Kageshwori Municipality of Kathmandu District. CVL confirmed ASF by RT-PCR method. For further confirmation and characterization, the samples were sent to Australian Animal Health Laboratory (AAHL), Geelong where they confirmed it to be Genotype II which is circulating in Asia, enabling the notification to OIE of the first ASF case in Nepal in May 2022. Till date six districts are affected by this disease which is shown in figure below.

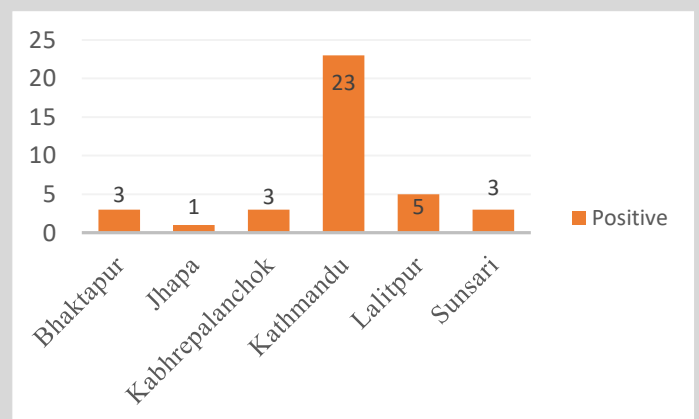


Fig. ASF cases from different districts of Nepal

### Treatment, prevention and control

There is no any specific treatment for ASF nor there is any licensed vaccine available commercially. Thus, biosecurity is only the cheap and reliable option for its prevention and control. Following are the prevention and control approaches.



## Disinfection

Following disinfectants are sensitive to ASF virus.

### Formaldehyde

- 3/1000 formalin for 30 minutes

### Sodium hypochlorite

- ASFV inactivated with 0.03%-0.5% chlorine for 30 minutes

### Iodine compounds

- 2-3% iodine compounds for 30 minutes

### Sodium hydroxide

- ASFV inactivated with 0.5% sodium hydroxide for 30 minutes, 1% sodium hydroxide for 3 minutes

### Calcium hydroxide (Lime)

- 1% calcium hydroxide for 3 minutes, 0.5% calcium hydroxide for 30 minutes; apply on the ground or floor of the barns to be visibly white. In case of disease outbreak, apply sufficient amount (1kg/m<sup>2</sup>)

## References

Antiabong, J., et al. (2006). "Molecular Evidence Of Transplacental (Vertical) Route Of Transmission Of African Swine Fever In Foetus Of Pig: A." *Veterinary Medicine* 2(2).

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## पशुपन्धी पालन गर्दा अपनाउनु पर्ने जैविक सुरक्षाका विधीहरू

“जैविक सुरक्षामा लगानी: ब्यबसायमा हुदैन नोक्सानी ”

जंगली पशुपन्धीलाई आफ्नो पशुपक्षिसग सम्पर्कमा आउन नदिन वारबन्देज गर्ने ।

खोर गोठको कम्पाउण्ड बाहिर प्रवेश निशेधको चिन्ह राख्ने र मानिसहरूको आवतजावत कमी गर्ने ।

खोरगोठ वरपर पानी जम्न र लामो झार हुन नदिने ।

गाडि निसंक्रमण तथा मानिसको निसंक्रमण गर्ने व्यवस्था गर्ने ।

आमन्त्रित ब्यक्तिहरूको लागि लग बुकको व्यवस्था गर्ने ।

खोर भित्र प्रवेश गर्नु पूर्व निसंक्रमण गरीएको बुट, एप्रोनको प्रयोग गर्ने ।

खोरगोठको मुल ढोकामा Foot Bath को व्यवस्था गर्ने ।

नियमित रुपमा फर्म मेशिनरीहरू र खोरगोठको निसंक्रमण गर्ने ।

स्वस्थ दानाको व्यवस्था गरी, सफा र ताजा दाना दिने, दाना भण्डारण कक्ष अलग बनाउने

फोहरको व्यवस्थापन गर्ने, मलमूत्र, मरेका पशुपक्षी को उचित ब्यबस्था गर्ने

पशुपक्षिको लागि स्वस्थ पिउने पानिको व्यवस्था मिलाउने ।

फर्म वरिपरी मूसा र बाह्य जीवको नियंत्रण गर्ने ।

पशुपक्षिलाई नियमित रुपमा खोप लगाउने ।



केन्द्रीय पशुपन्धी रोग अन्वेषण प्रयोगशाला, त्रिपुरेश्वर, काठमाण्डौ