

# Swinepox: An Old Skin Disease That Still Matters in Modern Pig Farming

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## ARTICLE HISTORY

Received: August 01, 2026  
Accepted: August 01, 2026  
Published: August 30, 2026

## Abstract

Swinepox is a visually striking but generally mild and self-limiting viral skin disease of pigs. It is caused by swinepox virus (SWPV), a poxvirus of the genus *Suipoxvirus*, and is mainly recognized in young pigs. The disease is characterized by a progression from erythematous macules and papules to vesicles or pustules, followed by necrosis, ulceration and dark crust formation. The pig louse, *Haematopinus suis*, is an important vector or mechanical transmitter, while skin trauma, other ectoparasites, direct contact and contaminated environments may facilitate spread. Histologically, epidermal hyperplasia, ballooning degeneration, vesicle or pustule formation, necrosis and characteristic eosinophilic intracytoplasmic inclusion bodies may be observed. Clinical appearance can strongly suggest swinepox, but PCR and histopathology are useful for confirmation, especially in unusual outbreaks. Differential diagnosis is particularly important when vesicular lesions are present because serious notifiable diseases must be excluded. Indian studies have documented SWPV outbreaks in several regions and have demonstrated a distinct Indian molecular lineage. Although mortality is usually low, outbreaks can cause production losses, secondary infections and increased management costs. Effective control depends mainly on ectoparasite control, sanitation, biosecurity, reduction of skin trauma and appropriate laboratory confirmation.

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DOI: <https://doi.org/10.5281/zenodo.22786342>

## Introduction

Skin lesions are among the first abnormalities noticed in pigs, and swinepox can produce a dramatic clinical appearance. Affected animals develop circular red spots, raised papules, pustules and dark crusts that may cover large areas of the body. Despite this striking appearance, uncomplicated swinepox is usually a mild, self-limiting disease. It is most important in young pigs and deserves attention because it can be confused with other dermatological or vesicular diseases and may indicate inadequate ectoparasite control, hygiene or housing management [1–4].

Swinepox is caused by swinepox virus (SWPV), classified in the genus *Suipoxvirus* within the family *Poxviridae*. Like other poxviruses, it is a large double-stranded DNA virus that replicates in the cytoplasm. The virus is strongly host adapted to pigs and wild boar and is not regarded as a zoonotic pathogen. Molecular

investigations in India have confirmed outbreaks in different regions and have provided evidence of a recognizable Indian lineage [4–7].

## Transmission and Farm Risk Factors

The pig louse, *Haematopinus suis*, is closely associated with swinepox transmission. Infectious material may be mechanically transferred between animals, particularly when ectoparasites and minor skin abrasions are present. Direct contact with infected lesions, contaminated materials and other arthropods may also contribute. Overcrowding, fighting, rough flooring, sharp projections, poor sanitation and inadequate ectoparasite control increase opportunities for infection. Because poxvirus material can persist in the environment, removal of crusts and thorough cleaning are important components of control [1–3].

### Clinical and Pathological Features

Lesions typically begin as small, round, reddened macules and progress to papules, vesicles or pustules. The central portion may become necrotic or ulcerated and eventually dries into a brown or black crust. Crusts subsequently detach as healing occurs, with the overall course commonly lasting several weeks. Lesions are often prominent on the abdomen, inner thighs, ears, snout, neck and other exposed areas. Young pigs, particularly those below three to four months of age, are most commonly affected. Most pigs remain active and continue eating, although fever, reduced appetite and temporary loss of condition may occur. Secondary bacterial infection can make lesions more severe [1–3].

Congenital swinepox is uncommon but important. Piglets infected before birth may be born with widespread crusted lesions and, in severe cases, weakness, stillbirth or early death. Histopathologically, swinepox primarily affects epidermal keratinocytes. Epidermal hyperplasia, ballooning degeneration, intercellular edema, vesicle or pustule formation, necrosis and ulceration may be accompanied by mixed inflammatory infiltrates. Eosinophilic intracytoplasmic inclusion bodies in affected keratinocytes are an important microscopic clue to poxvirus infection [3,8,9].



**Fig. 1.** Multiple circular pox-like skin lesions in a young pig. Source: Flock & Herd, Australia. Reproduction should be subject to the source's applicable permission/licensing requirements.

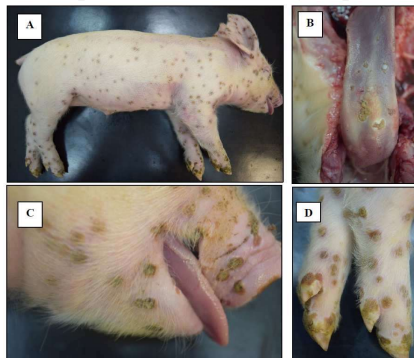


**Fig. 2.** Congenital swinepox with widespread crusted lesions in a neonatal piglet. Source: Animal Health Laboratory, University of Guelph. Reproduction should be subject to the source's applicable permission/licensing requirements.

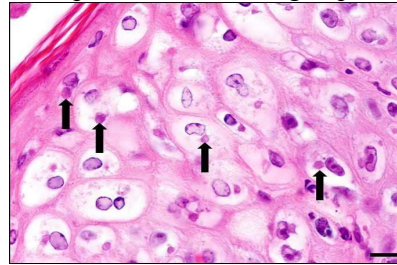


**Fig. 3.** Histological appearance of swinepox dermatitis showing ballooning degeneration and intracytoplasmic inclusions in keratinocytes. Source: Joint Pathology Center. Reproduction should be subject to the source's applicable permission/licensing requirements.

### Diagnosis and Differential Diagnosis

A typical outbreak in young pigs with characteristic lesions and evidence of lice may permit a strong clinical suspicion of swinepox. However, laboratory confirmation is advisable in unusual, severe or first-time outbreaks. Scabs, crusts and active lesion tissue are suitable materials for diagnostic testing. PCR targeting SWPV genes provides specific confirmation, while histopathology and virus isolation can provide additional evidence [1,4–7].

The differential diagnosis includes bacterial dermatitis, dermatophytosis, parasitic skin disease, pityriasis rosea and porcine dermatitis and nephropathy syndrome. Vesicular lesions involving the snout, mouth or feet require particular caution because serious vesicular diseases, including foot-and-mouth disease, may produce overlapping clinical signs. When a vesicular disease cannot be confidently excluded, immediate consultation with the appropriate veterinary diagnostic authority is essential [1].

### Treatment, Control and Prevention

There is no routinely recommended specific antiviral treatment for uncomplicated swinepox. Most affected pigs recover spontaneously, so management should focus on supportive care, prevention of secondary infection and correction of farm-level risk factors. Clean, dry bedding, adequate nutrition and minimization of skin trauma are beneficial. Antimicrobial treatment, when indicated for secondary bacterial infection, should be veterinarian-directed and

based on responsible antimicrobial-use principles [1–3].

Control of *Haematopinus suis* and other ectoparasites is central to prevention. Veterinary-approved products should be used according to an appropriate herd-level program, with attention to reinfestation. Pens and equipment should be cleaned thoroughly and contaminated organic material and detached scabs removed. Incoming pigs should be inspected and appropriately isolated before introduction. Overcrowding and sharp surfaces should be avoided, and workers should maintain suitable clothing, footwear and equipment hygiene. There is no widely used commercial swinepox vaccine in routine international practice; therefore, management and biosecurity remain the principal preventive measures [1–3].

### Swinepox in India

Indian investigations have demonstrated that swinepox is not merely a historical disease. SWPV was isolated and genetically characterized from piglets during an outbreak in Rohtak, Haryana, and subsequent studies documented natural outbreaks in Assam and investigated viruses from Haryana and Uttar Pradesh [4–7]. Molecular studies showed that Indian viruses form a distinct lineage compared with viruses reported from several other countries. More recently, a 2024 outbreak at an organized piggery farm in Punjab was investigated using histopathology, PCR and sequencing, again supporting the

presence of a distinct Indian group [10]. These findings highlight the value of surveillance and submission of suitable lesion material for laboratory confirmation.

Although swinepox is generally associated with low mortality, it can still cause economic and management consequences. Growth may be temporarily affected, secondary infections may prolong recovery, and farms may incur additional costs for treatment, cleaning and ectoparasite control. Visible lesions can also reduce the perceived health and market value of animals. Thus, swinepox should be regarded as a manageable disease that can nevertheless serve as a useful indicator of deficiencies in hygiene, vector control and housing.

### Conclusion

Swinepox is a visually dramatic but usually manageable disease of pigs. Recognition of its characteristic progression from macules and papules to pustules and dark crusts can provide an important clinical clue, particularly in young pigs. Histopathology and PCR strengthen diagnostic confidence, while exclusion of important vesicular diseases is essential when appropriate. In India, molecular studies demonstrate ongoing circulation and geographic genetic patterns of SWPV. For practical farm control, the message is simple: investigate the lesions, control lice and other ectoparasites, improve sanitation, reduce skin trauma and confirm unusual cases through appropriate laboratory testing.

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