

SURVEILLANCE OF INFECTIOUS DISEASES

IN ANIMALS AND HUMANS IN SWEDEN 2022

*Chapter excerpt:
Classical swine fever*



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Typesetting: Wiktor Gustafsson

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Reporting guidelines: Reporting guidelines were introduced in 2018 for those chapters related to purely animal pathogens. The guidelines build on experiences from several EU projects, and have been validated by a team of international experts in animal health surveillance. The aim is to develop these guidelines further in collaboration within the global surveillance community and they have therefore been made available in the form of a wiki on the collaborative platform GitHub (<https://github.com/SVA-SE/AHSURED/wiki>). Feel free to contribute!

Layout: The production of this report continues to be accomplished using a primarily open-source toolset. The method allows the source text to be edited independently of the template for the layout which can be modified and reused for future reports. Specifically, the chapter texts, tables and captions are authored in Microsoft Word and then converted to the LaTeX typesetting language using a custom package written in the R software for statistical computing. The package uses the pandoc document conversion software with a filter written in the lua language. Most figures and maps are produced using R and the LaTeX library pgfplots. Development for 2022 has focused on generalising the R package to accommodate conversion into formats other than LaTeX and PDF, with a focus on markdown files which can be published as HTML websites using the Quarto publishing system. The report generation R package and process was designed by Thomas Rosendal, Wiktor Gustafsson and Stefan Widgren.

Print: TMG Tabergs AB

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Suggestion citation: Surveillance of infectious diseases in animals and humans in Sweden 2022, National Veterinary Institute (SVA), Uppsala, Sweden. SVA:s rapportserie 89 1654-7098

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Classical swine fever

BACKGROUND

Classical swine fever (CSF) is a disease of pigs caused by a pestivirus closely related to bovine viral diarrhoea virus and border disease virus. CSF is endemic in many parts of the world and is one of the most important diseases affecting pig production globally. The disease is endemic in parts of Asia, South America and on some Caribbean islands. In Europe, several large outbreaks of CSF occurred in the 1980s and '90s, including an extensive outbreak in the Netherlands, Germany, Belgium and Spain in 1997–1998. These outbreaks led to the implementation of highly effective control and eradication strategies. During the last 10 years there have only been sporadic reports of outbreaks of CSF in domestic pigs and cases in wild boar in the eastern parts of the EU, including Lithuania (2009, 2011) and Latvia (2012–2015). The last reported case of CSF in the EU was in 2015. Sweden, where CSF has not been diagnosed since 1944, was issued official status as a historically CSF-free country by WOA in February 2015.

Classical swine fever virus is highly contagious and is transmitted by direct and indirect contact between animals. Wild boar can serve as a reservoir for the virus and there are several documented cases of outbreaks in domestic pigs

caused by direct or indirect contact with wild boar. Feeding pigs swill contaminated with CSFV has also resulted in the spread of the disease to new areas. Because of this, swill feeding of pigs is prohibited in the European Union.

DISEASE

CSF appears in three different clinical forms; acute, chronic and mild. The incubation period is 2–14 days and the acute form of the disease includes high fever ($<42^{\circ}\text{C}$), weakness, conjunctivitis, purple skin discolouration, diarrhoea and neurological signs. The acute form of CSF cannot be distinguished clinically from African swine fever (ASF). Chronically infected animals exhibit a more diffuse clinical picture with intermittent fever, anorexia and stunted growth. In the mild form, sow reproductive failure, including abortion, foetal mummification and stillbirths, is the main clinical sign. The mild form can also result in the birth of persistently infected piglets that initially appear healthy but shed large amounts of virus before becoming ill and dying several months later from “late onset CSF”.

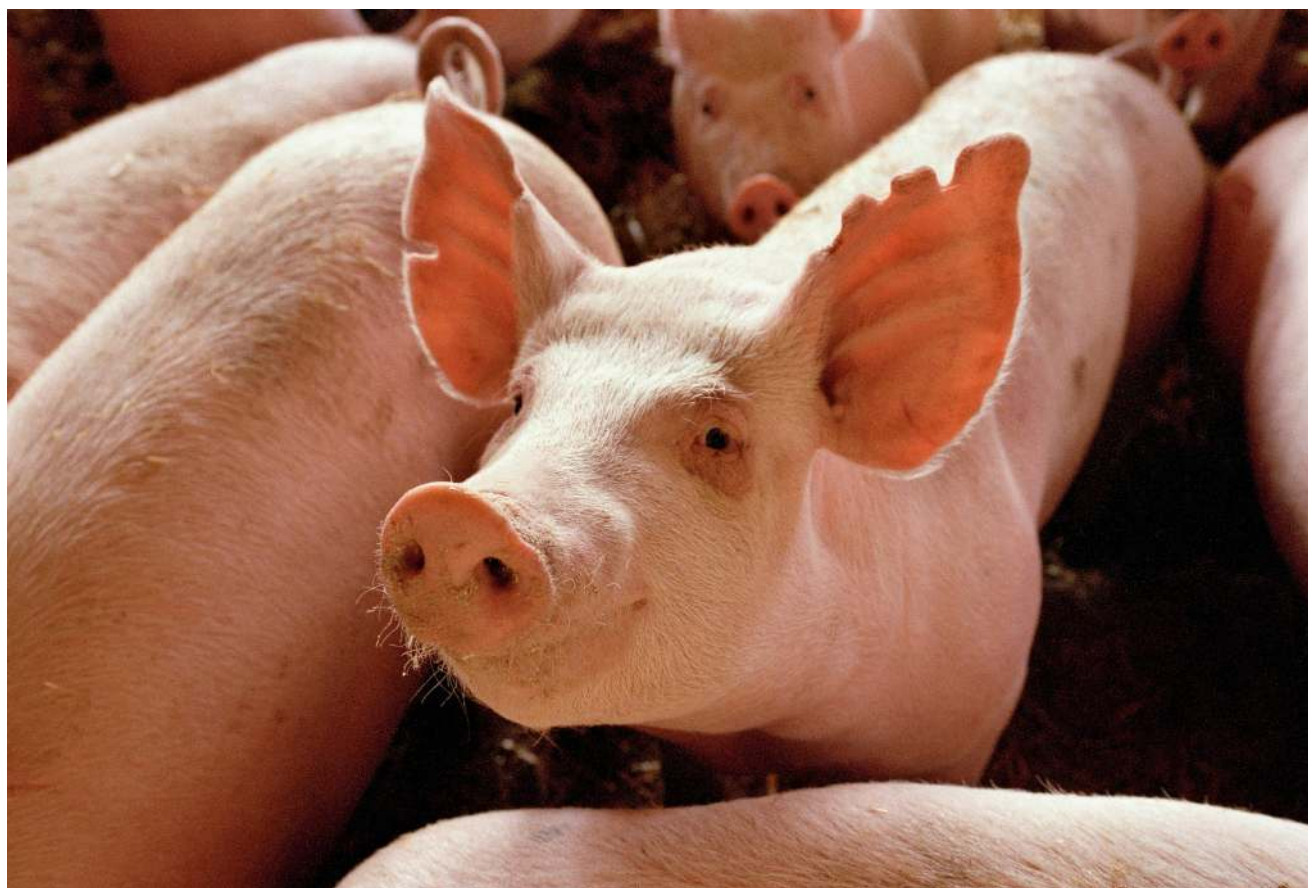


Figure 16: The purpose of the surveillance programme for Classical swine fever (CSF) in Sweden is to document freedom from CSF in the pig population and to contribute to the maintenance of this situation by early detection of an introduction. In 2022, 2144 pigs were tested and found negative for the disease. Photo: Bengt Ekberg/SVA.

LEGISLATION

CSF is a listed disease (category A, D and E) in the Animal Health Law, Regulation (EU) 2016/429. The disease is notifiable on clinical suspicion as described in SJVFS 2021/10 (K12).

SURVEILLANCE

The purpose of the surveillance for CSF is to ensure early detection of an introduction to the Swedish pig population and thus to contribute to the maintenance of freedom from the disease. The National Veterinary Institute (SVA) is responsible for surveillance design, sample analysis and reporting to the Swedish Board of Agriculture. Serological analyses for CSF, PCR analyses for the presence of CSF viral genome and CSFV culturing are performed at SVA. CSF serology is done using a commercial kit (IDEXX HerdChek® CSFV Antibody Test Kit, IDEXX Laboratories, Westbrook, Maine, United States) and, in the case of a positive ELISA result, a serum neutralisation (SN) test for detection of antibodies against CSFV is performed for confirmation.

Passive surveillance

Because CSF is notifiable on clinical suspicion for both veterinarians and farmers, cases with clinical signs consistent with CSF are investigated following notification to the Swedish Board of Agriculture. The investigation may include sampling of sick or dead animals, examination of the herd for the presence of clinical signs and analyses of production results. Due to the similarity in clinical signs, samples are typically analysed for both CSF and ASF, which is a strategy that is strongly recommended by the EU.

In addition, PCR analysis for the presence of CSFV genome is included in the enhanced passive surveillance of aborted fetuses (see chapter “Examinations of abortions in food producing animals” on page 146).

Active surveillance

The surveillance was designed using a between-herd design prevalence of 0.5%, a within-herd design prevalence of 40% and a risk of introduction of 1 in 25 years. The number of samples needed to achieve a probability of freedom of 99% is calculated yearly, taking the surveillance results of previous years into account. For 2022, the calculated number of samples needed was 2000. Blood samples collected within the abattoir sampling component of the surveillance for porcine reproductive and respiratory syndrome (PRRS), carried out by Farm and Animal Health (see chapter “Porcine reproductive and respiratory syndrome” on page 71), were used for the active surveillance of CSF in domestic pigs. Two to three samples per herd tested for PRRS were also analysed for CSF.

In addition to the active surveillance of CSF in domestic pigs, active surveillance of CSF in hunted Swedish wild boar has been undertaken yearly since 2000 (see chapter “Infectious diseases in wild boars” on page 129).

RESULTS

Passive surveillance

Five herd investigations following clinical suspicions of CSF in domestic pigs were carried out during 2022. In all herds, the primary clinical sign was the sudden, unexplained death of multiple animals within a short period of time. Post-mortem findings that could be attributed to CSF, including enlarged livers and organ haemorrhages, were also noted in three of these herds. During all investigations, samples were collected and analysed for CSF (and ASF). All samples were negative and all investigated herds were subsequently declared free from CSF.

Within the programme for enhanced passive surveillance of aborted fetuses, 15 fetuses from 10 herds were examined for the presence of CSF virus genome and all samples were negative.

Active surveillance

Serum samples from 2144 domestic pigs were analysed for the presence of antibodies for CSF in 2022. One sample tested positive on both ELISA and the confirmatory serum neutralisation test, which prompted a herd investigation. Clinical examination of the herd did not reveal any clinical signs consistent with CSF and additional samples collected from the herd all tested negative. Additionally, the sample that originally tested positive was sent to the EU reference lab in Germany for confirmatory testing, with negative results. The herd was subsequently declared free from CSF. All other samples taken during 2022 were negative. Taking the surveillance outcome from previous years into account, the probability of freedom from CSF during 2022 was >99%.

DISCUSSION

The results from the active and passive surveillance for CSF in Sweden in 2022 add to the documentation of freedom from this infection in the Swedish commercial pig population. In recent years, the Swedish pig industry has undergone significant structural changes, leading to a rapidly declining number of herds and extensive changes in the market and in the habits of farmers. The active surveillance, in terms of planning design and number of samples, is therefore evaluated yearly and adjusted accordingly if needed. Although the EU is now free from CSF, occasional outbreaks in domestic pigs in countries close to Sweden and the extensive movement of products and people, including labour in the animal production sector, emphasise the continued need for both passive and active surveillance for CSF.

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