



**Ministry of Environment  
and Food of Denmark**  
Danish Veterinary and  
Food Administration

# Animal Health in Denmark 2019

July 2020

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# Preface

It is a pleasure for me to present the 2019 Annual Report on Animal Health in Denmark on behalf of the Danish Veterinary and Food Administration (DVFA).

The Annual Report begins with a general presentation of the Danish animal health surveillance and contingency planning, including the essential preparedness measures introduced to prevent the introduction of contagious diseases to Danish livestock.

The report also reviews developments in 2019 in the field of animal health in Denmark. The main focus is on OIE-listed diseases and the animal diseases that are notifiable in Denmark.

The report provides statistical information and an overview of surveillance that may be useful for reference purposes. Furthermore, the report contains statistics on animal by-products as well as livestock.

I hope that you will find the information in this Annual Report useful; however, please visit our website at [www.dvfa.dk](http://www.dvfa.dk) if you need further details. If you cannot find the information you are looking for, please do not hesitate to contact us.

**Camilla Brasch Andersen**  
Deputy Chief Veterinary Officer  
Head of the Animal Health Division



# 1. Animal health surveillance and contingency planning

## Monitoring and control of animal diseases

As the competent veterinary authority, the Danish Veterinary and Food Administration (DVFA) is responsible for the monitoring and control of animal diseases in Denmark.

Denmark has a long history of intensive production of food of animal origin and of trade in animals and animal products. Relative to its size and compared with that of other countries, the level of animal production in Denmark is quite high, and production has increased over the past decades. Information on livestock statistics is given in Chapter 4 of this report.

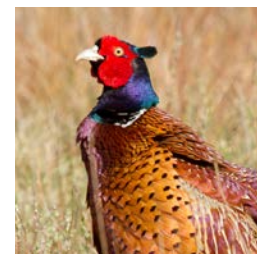
Concurrently with the increase in animal production, the implementation of disease surveillance and control programmes is essential to improve animal health and animal welfare and thereby support the production of safe foods.

Such programmes to control animal diseases, which are also intended to prevent human and animal infections and protect trade interests, are

subject to legislation. The extensive trade in Danish animals and animal products is highly dependent on the good health status of Danish livestock. To keep livestock healthy, various initiatives are taken to limit the risk of disease introduction into Denmark. One example is that the number of imported cloven-hoofed animals has been kept as low as possible for many years (see Table 26 in Chapter 4). Disease status is paramount when it comes to the issuance of export certificates for Danish animals and products (see the description in Box 4).

Denmark is a member of the World Organisation for Animal Health (OIE) and meets all obligations of transparency on the animal disease situation, including the obligation to give notification of any occurrence of a listed disease. Further, as a member of the EU, Denmark has adopted the harmonised EU legislation on animal health and animal production.

The DVFA is constantly adapting the legal framework of the disease control regulations to changes in farming practices, disease risk assessments, EU legislation, etc. Therefore, the contingency plans



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Relative to its size and compared with that of other countries, the level of animal production in Denmark is quite high, and production has increased over the past decades.

## A description of all notifiable animal diseases in Denmark is available at [www.fvst.dk](http://www.fvst.dk).

for disease outbreaks are revised on a regular basis. Additionally, operational capabilities are continuously improved to provide a prompt and effective response to every single suspected case or outbreak of a notifiable infectious disease in the Danish livestock population.

The main purpose of the improvements in operational capabilities is:

- To reduce the likelihood of the introduction of exotic livestock diseases in Denmark.
- To curb disease spread in susceptible animal populations by restricting hazardous animal trade practices and maintaining a constant focus on improving biosecurity measures.
- To ensure effective disease surveillance and early detection of diseases.
- To have plans in place for appropriate and effective actions to control disease outbreaks.

### Animal disease preparedness

#### Obligation to notify suspicions

The Danish Animal Health Act<sup>1</sup> is the legislative basis for the current notification procedures. The Act also lays down the list of notifiable animal diseases in Denmark and the rules for the notification of sus-

pected cases of those diseases. Furthermore, the Act gives legal powers to carry out diagnostic and epidemiological investigations, impose movement restrictions, create protection and surveillance zones, control movements within such zones, take samples, cull infected and in-contact animals, pay compensation to farmers, destroy carcasses and potentially infective materials, carry out cleaning and disinfection and, if necessary, carry out emergency vaccination.

The notifiable animal diseases listed in Executive Order No. 1381 of 11 December 2019 are divided into two groups: list 1 and list 2 diseases. Any suspicion of a list 1 disease must immediately be notified to the DVFA, whereas notification of a list 2 disease is mandatory after confirmation of the disease. The Danish list 1 of notifiable diseases includes all serious diseases in animals as well as several zoonotic diseases. A description of all notifiable animal diseases in Denmark is available at [www.fvst.dk](http://www.fvst.dk) (in Danish).

Effective surveillance for clinical signs of contagious diseases is required for early detection of disease outbreaks. According to the Animal Health Act, all farmers are obliged to call a veterinarian right away in case of suspicion of a notifiable disease. If the

<sup>1</sup> The Animal Health Act has been amended since the year under review. The most recent statute is Animal Health (Consolidation) Act No. 38 of 15 January 2020. Link: <https://www.retsinformation.dk/Forms/R0710.aspx?id=212450> (in Danish)



## Box 1

# The role of private veterinarians in national contingency plans

Denmark maintains a high level of preparedness for notifiable diseases in animals involving the full range of stakeholders: authorities, private veterinarians and farmers. In 1995, the first veterinary advisory service contracts (VASCs) were signed with owners of herds of cattle and pigs. In 2010, it became mandatory for owners of large herds of cattle and pigs and for mink farm owners to sign a VASC. Small cattle and pig holdings may be registered for advisory services on a voluntary basis.



A central element of a VASC is frequent veterinary advisory visits to the farm, creating a one-on-one relationship between the farmer and the veterinarian. Further, a VASC provides the farmer with extended treatment possibilities.

The most important aims of VASCs are to maintain focus on advice and the prevention of diseases rather than treatment to ensure the prudent use of antimicrobials to minimise antimicrobial resistance (AMR) and hence improve animal welfare. More information on the Danish strategy for the reduction of AMR is given in Box 2 in this chapter.

Having signed a VASC, the farmer usually consults the same veterinarian, who can be temporarily replaced by a colleague from the same veterinary practice, if necessary. This gives the veterinarian a unique insight into the health of the herd and enables a faster reaction to disease outbreaks in the herd.

Private veterinarians are also part of the national contingency plans. If a farmer suspects a notifiable animal disease, s/he is obliged to contact his or her veterinarian immediately. In such a situation, the

private veterinarian is obliged to inspect the herd and the animals in question and to evaluate whether further action should be taken. Depending on the suspected disease, the private veterinarian then contacts the relevant Veterinary Inspection Unit (VIU) of the Danish Veterinary and Food Administration (DVFA). A veterinary officer from the VIU will then inspect the herd within five hours and report the suspected case to the DVFA. All suspected cases of notifiable diseases will immediately be registered in a database and announced on the website of the DVFA. Depending on the nature of the suspected disease, the international animal health organisations will also be notified. A national database and a web interface have been set up to increase the awareness among farmers and veterinarians of the potential presence of certain notifiable diseases.

A VASC is a means to ensure that the farmer is advised by his or her veterinarian of ways to increase biosecurity that can contribute to the general health of his or her herd, while the veterinarian also acts as a first-line defence in the surveillance of notifiable animal diseases.

## Immediate notice is given on the website of the DVFA of all suspected cases of a notifiable disease.

When a veterinarian suspects a list 1 disease, the veterinarian must immediately notify the relevant Veterinary Inspection Unit (VIU) of the DVFA. A veterinary officer from the VIU will inspect the herd or flock within five hours and make a report to the DVFA on the suspected case. If the veterinary officer cannot rule out the suspicion of a list 1 disease, official restrictions are imposed on the herd or flock, and test material is collected and dispatched to the National Reference Laboratory.

As a second line of defence, official veterinarians are responsible for inspecting all animals at shows as well as animals intended for production, slaughter or export at assembly centres and animals intended for export directly from the farm. Also ante-mortem inspection and post-mortem examination at slaughterhouses are important elements of the surveillance system.

The role of the private veterinarian in animal health surveillance in Denmark is described in Box 1 in this chapter.

### Handling of suspected cases

The DVFA ensures that all suspected cases are handled in a uniform way. This is achieved by the application of 'action cards' developed for most of the notifiable diseases. The action cards, which are available on the DVFA intranet, list all actions necessary to handle a suspected case.

### Transparency in dealing with suspected cases and outbreaks

All suspected cases of a notifiable disease will immediately be published on the website of the DVFA (in Danish). The official website of the DVFA displays information on each individual suspicion notified. This is done to increase the awareness among farmers and veterinarians of the potential presence of the relevant notifiable disease.

If a suspected case is deemed to be of potential interest to the general public and/or export markets, a website notice will be followed up by a press release. Additionally, targeted information will be sent to the embassies of Denmark's main export markets. The database is publicly available at [www.fvst.dk](http://www.fvst.dk) (in Danish).

### Compensation for losses caused by notifiable diseases

The DVFA offers compensation to animal owners who suffer a financial loss due to an outbreak of a notifiable disease. The compensation scheme contributes significantly to making animal owners comply with the obligation to notify listed diseases. In case of an outbreak of a notifiable disease leading to a loss of animals and/or eggs and the destruction of contaminated feed, the DVFA offers compensation for the value of the animals, eggs and feed. In most outbreaks, this value is estimated by a valuation committee. The committee has three members:

one appointed by the herd owner, one appointed by the DVFA and one being an employee of the DVFA. The premises are cleaned and disinfected according to a fixed plan, the cleaning and disinfection being paid by the DVFA. Furthermore, the DVFA pays 20% of the estimated income loss due to the disease outbreak. If the outbreak is in either cattle or pigs, the Cattle Levy Fund or the Pig Levy Fund will cover the remaining income loss. The poultry sector does not have a similar scheme compensating loss of income.

# 20%

**The DVFA pays 20% of the estimated income loss due to the disease outbreak. If the outbreak is in either cattle or pigs, the Cattle Levy Fund or the Pig Levy Fund will cover the remaining income loss.**



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## Box 2

# Danish strategy to reduce antimicrobial resistance (AMR)

Antimicrobial resistance (AMR) is of growing global concern, and it is foreseen that AMR in human pathogens will cause an increasing number of deaths as well as higher healthcare costs. Moreover, the use of antimicrobials in humans and animals may lead to selection for resistant pathogens.

From a One Health perspective, the close connection between animals, food, people and the environment therefore necessitates action across sectors and a strong call for reduced and more prudent

use of antimicrobials in both humans and animals to mitigate AMR.

Denmark has a long history of combatting AMR. Since 1995, Denmark has monitored antimicrobial consumption and resistance across humans, food and animals (DANMAP). DANMAP has been developed in close collaboration between authorities, industry and scientists, and stakeholders continuously discuss interventions to ensure a high level of compliance and maximum effect.

The Danish approach to AMR is based on certain fundamental principles according to which all veterinary antimicrobials are prescription-only, prophylactic use is not allowed, and Danish veterinarians are not allowed to make a profit from the sale of antimicrobials. Furthermore, laboratory examination of samples from cases of pneumonia and diarrhoea must be performed to identify the cause of the infection before group treatment of pigs is prescribed. These initiatives are supported by guidelines for veterinary practitioners on the prudent use of antimicrobials in pigs and cattle.



The large Danish pig production accounts for the vast majority (75%) of antimicrobials used in animals in Denmark. Many initiatives to reduce AMR are therefore aimed at the pig sector. In 2010, the Yellow Card Initiative was introduced to reduce the use of antimicrobials in pig production. A 'yellow card' is given, when the consumption of antimicrobials in a pig herd exceeds a fixed national threshold. The pig farmer is thereby ordered to make an action plan to reduce the use of antimicrobials below threshold level.

In 2016, the Yellow Card Initiative was expanded to reduce the use of critically important antimicrobials, such as third-generation and fourth-generation cephalosporins, fluoroquinolones and colistin. Despite an increase in pig production, Denmark has achieved, through the Yellow Card Initiative commencing in 2010, a reduction of 31% in the total use of antimicrobials in pigs from 2009 to 2019. Moreover, the use of critically important antimicrobials is now close to zero.

Denmark aims at a more prudent use of antimicrobials and has obtained good results from determining national targets for the reduction in the use of antimicrobials. A new advisory Committee on Veterinary Medicines was established in 2018 to provide evidence-based advice for the authorities on the use of veterinary medicines. In 2019, a new national target was determined for an 8% reduction in the use of antimicrobials in the pig sector by 2022.

Denmark's long history of AMR initiatives was also highlighted in a recent report published in collaboration with FAO in 2019 (see [www.fao.org](http://www.fao.org)).

### Pathogen-specific surveillance

Denmark has several pathogen-specific surveillance programmes intended to demonstrate the absence of diseases that usually cause mild or no clinical symptoms, or to determine the occurrence, prevalence or distribution of diseases. The surveillance method used depends on the disease and the purpose of the programme, and usually a combination of different surveillance methods is applied. Several Danish surveillance programmes are mentioned in Chapter 2 of this report.

The DVFA focuses especially on infectious diseases with increasing incidence in other countries and an epidemic potential, which raises the risk of their introduction into Denmark in the near future. The DVFA has implemented a rapid and systematic model to qualitatively evaluate the risk of disease introduction in case of disease outbreaks in other EU Member States or certain countries outside the EU. For more information on this rapid risk assessment for disease introduction, see Box 3 in this chapter.

Examples of Danish surveillance programmes for emerging diseases are given below:

The surveillance method used depends on the disease and the purpose of the programme, and usually a combination of different surveillance methods is applied.

Several Danish surveillance programmes are mentioned in Chapter 2 of this report.

## Being prepared is an important precautionary principle to enable a rapid and effective response to any outbreak of an infectious disease.

- Blood sample testing of outdoor poultry for West Nile fever. For more information on the surveillance scheme for West Nile virus in Denmark, see Box 6 in section 2.1 of this report.
- Cattle farmers are offered laboratory examination of material from abortions in the form of a post-mortem examination and subsequently microbiological and histological examinations. Such an examination comprises an analysis for brucellosis, bovine virus diarrhoea and any new emerging infections causing abortion in cattle. For more information, see Box 7 in section 2.2 of this report.
- Swine carcass samples submitted by pig farms to a diagnostic laboratory undergo a general post-mortem examination, and selected samples are examined for classical swine fever and African swine fever. For more information on the supplementary surveillance for African swine fever and classical swine fever, see Box 8 in section 2.4 of this report.
- The DVFA offers free testing of hunted wild boars for Aujeszky's disease, African swine fever, classical swine fever and *Trichinella* spp. For more information on the free testing, see section 2.4 of this report.
- In 2014, the DVFA initiated a special surveillance programme for porcine epidemic diarrhoea, which continued in 2019. For more information on the non-existence of porcine epidemic diarrhoea virus in Denmark, see Box 9 in section 2.4 of this report.

### Disease control

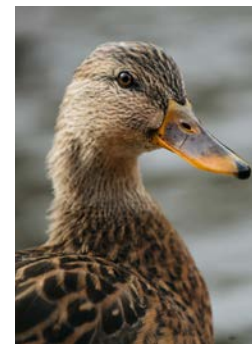
#### Contingency plans

Being prepared is an important precautionary principle to enable a rapid and effective response to any outbreak of an infectious disease. Almost every year, outbreaks of diseases occur in nearby countries with comparable intensive animal production systems.

Despite a history of few disease outbreaks in Denmark, the DVFA has made great efforts to prepare and revise its contingency plans. These plans include all necessary actions to handle infected herds, ensuring an efficient control of any disease outbreak.

#### The general contingency plan and the disease-specific manuals

The Danish contingency plan consists of a general plan and disease-specific manuals. The Danish contingency plan comprises an overall eradication strategy, tools for eradication, a crisis organisation and a crisis management and communication plan. The disease-specific manuals include operational instructions for those involved in managing the response to the following diseases: foot and mouth disease, classical swine fever, African swine fever, bovine spongiform encephalopathy, scrapie, avian influenza, Newcastle disease, bluetongue, lumpy skin disease, Rift Valley fever, peste des petits ruminants, sheep pox and goat pox, epizootic haemorrhagic disease, African horse sickness, West Nile fever and



Despite a history of few disease outbreaks in Denmark, the DVFA has made great efforts to prepare and revise its contingency plans.

### Box 3

## Rapid qualitative risk assessment of the threat of disease introduction

The Danish Veterinary and Food Administration (DVFA) monitors animal disease outbreaks of high significance in the EU, the Nordic countries and countries neighbouring the EU.

Due to increased global mobility, the trade in live animals and animal products and the interaction with livestock production systems of other countries (e.g. through transport vehicles), there is a risk of introduction of new infectious diseases in Denmark.

The DVFA has implemented a structured, systematic, transparent and well-documented rapid qualitative risk assessment tool for preventing the introduction of diseases in Denmark in case of animal disease outbreaks in other EU Member States or in certain countries outside the EU. This is in accordance with the guidelines given in the OIE Handbook on Import Risk Analysis for Animals and Animal Products, in particular the risk assessment steps. The risk assessment process is well-documented as a step-by-step process. Hazard identification is the first step and is considered separately from the assessment of risk. The risk assessment process itself is subdivided into four steps: (1) entry assessment, (2) exposure assessment, (3) consequence assessment and (4) risk

estimation. The overall risk estimation is made by integrating the entry, exposure and consequence assessments.

The rapid qualitative risk assessment is a document reporting on the estimated risk of introduction of epizootic or zoonotic diseases in susceptible animal populations in Denmark. It is intended to help risk managers prepare for possible health risks and to reduce the social and economic consequences of the relevant threat (the pathogen causing the disease).

In short, the aim of this qualitative risk assessment is to provide a well-documented report describing:

- The importance and purpose of the disease risk assessment (hazard identification).
- The current status of the relevant disease in the EU or in neighbouring countries.
- The estimated level of the risk of introduction of specific diseases into Denmark.
- The significance of the consequences if a disease gains a stronghold in Denmark and spreads from the first infected population to other sensitive animal populations.

Depending on the estimated risk level, the DVFA will consider whether to launch risk mitigating actions.

Results from the rapid risk assessment are then used by the risk managers for determining risk-mitigating actions, such as the imposition of a requirement of more thorough inspection of vehicles for international transportation of animals, further tests of recently imported live animals and, depending on the estimated risk level, the need for specific information to relevant groups of the public. If necessary, risk mitigating measures are recommended to all stakeholders.

All qualitative rapid risk assessment reports are published by the DVFA at [www.fvst.dk](http://www.fvst.dk) (in Danish with a summary in English) within three working days from the time when the official outbreak notification is received.

In 2019, specific risk assessments were made for avian influenza, African swine fever, bluetongue and West Nile fever due to outbreaks in the EU and countries neighbouring the EU.

## Box 4

# Certification of animal products

EU legislation lays down the general principles and requirements of food law. According to Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002, Member States exporting products of animal origin must generally comply with bilateral agreements with third countries. However, products of animal origin complying with the relevant EU legislation can be exported to all third countries at the exporter's own expense and risk. Regulation (EU) 2017/625 of the European Parliament and of the Council of 15 March 2017 governs official controls and other official activities performed to ensure the application of food and feed law, rules on animal health and welfare, plant health and plant protection products.

The issuing of certificates for products of animal origin is based on national legislation (Executive Order No. 671 of 1 June 2018)<sup>2</sup> and Commission Implementing Regulation (EU) 2019/628 of 8 April 2019. Certificates must be based on a thorough investigation of the background for the certification. Furthermore, the certifying

officer must be impartial and independent from commercial interests. According to the rules governing the issuing of certificates in Denmark, certificates can be issued on the basis of regular auditing and verification procedures at establishments. Certificates will be issued based on facts obtained within the context of monitoring programmes, officially recognised quality assurance schemes and epidemiological surveillance programmes by a person authorised by the competent authority. The certifying officer must not certify data of which s/he has no personal knowledge or

which cannot be ascertained. No blank or incomplete certificates, or certificates for products which have not been inspected or are no longer available for inspection, can be issued.

If an animal disease breaks out, all Danish certificates of animals and animal products in which data on the disease status have been certified are immediately assessed by the DVFA, and no new certificates will be issued if certified data no longer apply. If necessary, withdrawal procedure of products will be initiated.



<sup>2</sup> Replaced by Executive Order No. 729 of 29 May 2020 before the date of publication.



## All contingency plans are regularly updated to be in line with the experience gained in other European countries.

aquaculture diseases. All contingency plans are publicly available at [www.fvst.dk](http://www.fvst.dk) (in Danish).

The following types of specific information are included in the disease-specific contingency plans: characteristics and epidemiology of the disease, sampling procedures, disease-specific cleaning and disinfection procedures, the establishment of restriction zones, instructions for handling animals and materials from infected herds and herds within the zones, instructions for screening and emergency vaccination.

All contingency plans are regularly updated to be in line with the experience gained in other European countries. Updates are also based on experience gained from simulation exercises and from handling actual outbreaks, changes in farming practices, revisions to EU legislation and the most recent scientific knowledge.

### Vaccination policy

The main methods for disease control described in the Danish contingency plans are the quarantining of farms suspected of housing infected animals, killing of infected animals, cleaning and disinfection, and zoning.

In general, preventive vaccination is banned. However, following an epidemiological analysis of the disease situation, the DVFA may use emer-

gency vaccination to control an outbreak. However, emergency vaccination requires an approval by the European Commission.

### Disease control and eradication - 'the Danish model'

Denmark has a long tradition of eradicating animal diseases. A prominent example is that tuberculosis and brucellosis were eradicated from domestic livestock in Denmark by the mid-1900s. The eradication was achieved as a result of close collaboration between the veterinary research laboratory, the veterinary administration authority and the industry since the late 1800s. In those days, farmers created both dairy and slaughterhouse cooperatives, which were owned by the farmers. All farmers therefore had a common interest in producing high-quality products.

On many occasions, the animal farming industry has launched voluntary initiatives to control the occurrence of infections. Those initiatives have gained broad support from all farmers, and effective eradication measures have subsequently been supported by legislation.

Several animal diseases besides tuberculosis and brucellosis have been eradicated in Denmark due to the efficient 'Danish model', e.g. enzootic bovine leukosis, Aujeszky's disease, infectious bovine rhinotracheitis, bluetongue and viral haemorrhagic septicaemia.

## Simulation exercises constitute an important tool for testing contingency plans, but are also used for the training of DVFA staff and different stakeholders in handling emergency situations.

### The disease control organisation

The emergency preparedness and response of the competent authorities to an outbreak of a notifiable disease is facilitated by the legal powers of the competent authorities, statutory provisions granting ample financial resources and the direct chain of command. Moreover, contingency plans are in place for the operation of the National Disease Control Centre (NDCC) and the establishment of a Local Disease Control Centre (LDCC).

In the event of an outbreak, the NDCC is staffed by employees from the DVFA central office, and the LDCC by employees from the relevant VIU(s). The DVFA has three VIUs with local veterinary officers specifically trained in managing suspected cases and outbreaks of notifiable animal diseases.

### Training

The veterinarians from the DVFA, including veterinarians from the VIUs, organise and prepare practical training in the contingency plans. The field staff are trained at seminars and targeted courses and by participation in simulation exercises.

Veterinary officers from the DVFA maintain their expertise by participating in relevant courses and training activities, such as courses held under the auspices of the EU 'Better Training for Safer Food' (BTSF) programme and training organised by FAO

(the European Commission for the Control of Foot-and-Mouth Disease (EuFMD)).

### Simulation exercises

Simulation exercises constitute an important tool for testing contingency plans, but are also used for the training of DVFA staff and different stakeholders in handling emergency situations. Furthermore, exercises may be used for testing new equipment and procedures.

The Danish exercise programme comprises a number of exercises each year. The number is not fixed in advance, but depends on the animal health situation, including the number of real cases. Lessons learned from all exercises throughout the year and from handling disease outbreaks are used to establish the most beneficial exercise programme for the following year.

The following categories of exercises are applied in the Danish training programme:

- Procedure exercises: Training in disease-handling procedures.
- Dilemma exercises: Desktop exercises to simulate a specific dilemma or train the use of new software.
- Crisis management exercises: Exercises with a broader scope, such as the assessment of

resources, setting up of crisis centres, actions to control outbreaks, communication and collaboration between national or international partners as either local training or full-scale national simulation training involving both regional and national units.

- Evaluation seminars: Each year, the lessons learned from all exercises are evaluated. The learning obtained is used for updating contingency plans and internal procedures and is incorporated into the exercises the following year to create a multiplier effect.

Simulation exercises are conducted at regional level, at national level and, due to the close cooperation among the Nordic and Baltic countries (the Nordic-Baltic Veterinary Contingency Group), also as cross-border exercises at international level.

Full-scale exercises are conducted at intervals of 3-5 years, and extensive contingency exercises are carried out regularly for all eight Nordic and Baltic countries.

The exercises may involve a number of stakeholders, such as the National Reference Laboratory, the Danish Emergency Management Agency, the National Police, agricultural organisations, slaughterhouses and rendering plants.

In 2019, Denmark conducted a full-scale national crisis management exercise with the aim of developing and expanding crisis management skills with special focus on African swine fever and a number of procedure exercises at regional level. Further, the DVFA participated in exercises planned and conducted by other organisations.



# 2. Livestock disease status

In general, Danish livestock have a favourable health status regarding a large number of OIE-listed diseases, and only few diseases cause problems in the production of livestock.

Denmark is officially recognised by the OIE as a country free from foot and mouth disease without vaccination, and Denmark also has the official status of a country free from classical swine fever, peste de petit ruminant and African horse sickness.

Since 2011, Denmark has been recognised as a country with a negligible risk of bovine spongiform encephalopathy (BSE) by the OIE. Comprehensive BSE testing has been conducted for more than two decades, and the last case of BSE in Denmark occurred in 2009 in a 14-year old cow. No BSE cases have been born after the most recent tightening of the feed ban in January 2001.

In 2019, no outbreaks of highly pathogenic avian influenza (HPAI) were diagnosed in poultry and other captive birds. However, HPAI H5N6 was diagnosed in a dead wild bird in 2019. Further, three outbreaks of low pathogenic avian influenza (LPAI) were detected in a flock of free-range laying hens and two flocks of mallards kept for restocking of game birds.

Within the EU, Denmark is recognised as officially free from Aujeszky's disease, bluetongue, bovine brucellosis, bovine tuberculosis, infection with *Brucella melitensis*, enzootic bovine leukosis, infectious bovine rhinotracheitis (IBR), infectious haematopoietic necrosis (IHN), infectious salmon anaemia (ISA) and viral haemorrhagic septicaemia (VHS).

An overview of the animal health status in Denmark for OIE-listed diseases is given at the end of each section for the relevant animal category.

Information on the Danish strategies for the monitoring and control of animal diseases is given in Chapter 1 of this report and on the website of the Danish Veterinary and Food Administration at <https://dvfa.dk>

**In general, Danish livestock have a favourable health status regarding a large number of OIE-listed diseases, and only few diseases cause problems in the production of livestock.**





# 2.1 Multiple species diseases

For decades, Denmark has not experienced any outbreaks of Aujeszky's disease, brucellosis in bovine herds, foot and mouth disease, sylvatic rabies or trichinellosis. Brucellosis has not been detected in Danish pig herds since 1999. Furthermore, Denmark is free from disease caused by *Brucella melitensis*, which has never been recorded in Denmark, and Denmark has been recognised as free from bluetongue since 2011.

## Aujeszky's disease

Denmark is recognised as officially free from Aujeszky's disease by the European Commission (Commission Decision 2008/185/EC). The disease has not occurred in Denmark since 1991.

Under the Danish Aujeszky's disease surveillance programme, blood samples from 2% of all sows with a live weight of more than 140 kg are tested at slaughter or before trade. The current surveillance programme was initiated in 2012. In addition, all boars at semen collection centres are regularly tested in accordance with the provisions of Council Directive 90/429/EEC. Moreover, breeding pigs intended for export to certain countries outside the EU are tested for Aujeszky's disease.

One suspected case of Aujeszky's disease was notified to the Danish Veterinary and Food Administration (DVFA) in 2019. The case was notified because an animal had tested positive in a serological test performed before it entered a semen collection

centre. Official restrictions were imposed on the herd under suspicion while confirmatory laboratory testing was being conducted at the National Reference Laboratory. The suspected case tested negative for Aujeszky's disease.

The number of blood samples examined for Aujeszky's disease in the period 2017-2019 is given in Table 1.

The number of blood samples examined for Aujeszky's disease in the period 2017-2019 is given in Table 1.

**Table 1**  
Blood samples examined under the Danish Aujeszky's disease surveillance programme, 2017-2019

Year	Samples
2017	44,247
2018	43,553
2019	39,977

Source: The Technical University of Denmark, the SSI (Statens Serum Institut) and other official laboratories in the EU, 2020.

## A surveillance programme for bluetongue has been implemented in Denmark according to Commission Regulation (EC) No 1266/2007.

### Bluetongue

Since 1 January 2011, Denmark has been recognised as free from bluetongue according to Commission Regulation (EC) No 1266/2007.

In 2007 and 2008, not only Denmark, but also most North and Central European countries, experienced outbreaks of bluetongue caused by virus serotype 8 (BTV-8) in herds of sheep and cattle. The last outbreak of bluetongue (BTV-8) in Denmark occurred in November 2008.

In 2008, a vaccination campaign against BTV-8 was initiated both in Denmark and in several other EU Member States to control outbreaks of the disease. However, vaccination against bluetongue has been banned altogether in Denmark since 1 January 2011.

A surveillance programme for bluetongue has been implemented in Denmark according to Commission Regulation (EC) No 1266/2007. Serological tests were performed on blood samples collected from 60 cattle herds in 2019. In total, 600 blood samples were tested. All tested negative for bluetongue.

Vector surveillance activities have been carried out in Denmark since the first outbreak of bluetongue. For further details on vector surveillance, see Box 5 in this section.

The DVFA was notified of three suspected cases of bluetongue in 2019: in a cow, a goat and a sheep, respectively. All three cases were reported due to clinical symptoms. Official restrictions were imposed on the herds under suspicion while laboratory testing was conducted. The virological tests of samples from all herds under suspicion proved negative.

### Brucellosis

Denmark has been recognised as officially free from brucellosis in bovine herds since 1979 (Commission Decision 2003/467/EC). The official Danish eradication programme for brucellosis in bovine herds began in 1948, and all cattle herds were identified as free from brucellosis in 1959. Brucellosis has not occurred in cattle in Denmark since 1962. All bulls at semen collection centres are regularly tested in accordance with the provisions of Council Directive 88/407/EEC. Cattle intended for export to certain countries outside the EU are also tested. In 2019, 55 aborted foetuses from cattle underwent laboratory testing for brucellosis. All tested negative. See Box 7 in section 2.2 for more information on the supplementary surveillance for brucellosis in cattle.

Brucellosis has not been detected in pigs since 1999, when *Brucella suis* biovar 2 was diagnosed in a herd of free-range pigs. The source of the infection was never found, but it is suspected



The DVFA was notified of three suspected cases of bluetongue in 2019: in a cow, a goat and a sheep, respectively.



## Box 5

# Suveillance for disease vectors in Denmark in 2019

Over the years, there has been ever-increasing focus on insect vectors and the pathogens transmitted by those vectors. Organised monitoring of vector activity has been carried out in Denmark since 2007 when Denmark experienced the first outbreak of bluetongue. In the following years, the vector surveillance programme was expanded to include mosquitoes, horse flies and ticks.

Since 2012, the Danish Veterinary and Food Administration (DVFA) and the Technical University of Denmark (in 2019 replaced by the University of Copenhagen) have carried out systematic surveillance of mosquitos and biting midge abundance during the warm season. Vectors are collected on a weekly basis through the use of octenol and CO<sub>2</sub>-baited suction traps in private gardens and light traps at cattle farms. National average abundance estimates are updated weekly at [www.myggetal.dk](http://www.myggetal.dk) (in Danish). Additional traps are operated permanently at Copenhagen Airport to monitor potential introductions of exotic mosquito species.

In 2017, the seasonal vector surveillance was expanded to include weekly surveillance of four groups of *Tabanidae* biting

flies at a horse farm, a pig holding and a cattle holding. Since June 2017, the surveillance has also included larvae, nymphs and adults of *Ixodes ricinus* ticks at three forest sentinel sites.

In the summer of 2019, the *Culicoides* activity was characterised as average to high based on results from the surveillance.

The number of mosquitoes collected during the summer season peaked at the beginning of the summer and was subsequently very low for the remainder of the season. Also, the prevalence of Nile fever

mosquitoes, *Culex modestus*, seemed to be low according to field studies at a few of the known hotspots in Denmark.

The surveillance of *Tabanidae* is still new, and it is difficult to compare density in 2019 with that of the two preceding years. However, the season appears to be very short in Denmark.

The prevalence of ticks in Denmark in 2019 corresponded to the average abundance of ticks. The finding of an adult *Hyalomma* tick in the spring of 2019 indicates that ticks of this exotic species are able to survive the winter in Denmark.





**Table 2**

Blood samples examined under the Danish brucellosis surveillance programme, 2017-2019

<b>Year</b>	<b>Cattle: Blood samples</b>	<b>Pigs: Blood samples</b>	<b>Sheep and goats: Blood samples</b>
<b>2017</b>	1,007	33,429	1,986
<b>2018</b>	1,223	33,973	2,270
<b>2019</b>	1,019	33,356	2,314

Source: The Technical University of Denmark, the SSI (Statens Serum Institut), and other official laboratories in the EU, 2020.

that *B. suis* biovar 2 had been transmitted from European brown hares in the area. *B. suis* biovar 2 has not been detected in hares since 2002, when it was diagnosed in two wild hares found dead. All boars at semen collection centres are regularly tested in accordance with the provisions of Council Directive 90/429/EEC. Also breeding pigs intended for export to certain countries outside the EU are tested for brucellosis. Due to fluctuations in trade, the number of samples tested varied in the period under review.

*Brucella melitensis* has never been reported in Denmark, and Denmark has been recognised as being officially free from *B. melitensis* since 1995 (Commission Decision 93/52/EC). A serological surveillance programme for *B. melitensis* is carried out by testing blood samples collected through the

voluntary lentivirus control programme managed by SEGES, the Danish Agriculture and Food Council (see section 2.3 on sheep and goat diseases).

In 2019, nine suspected cases of brucellosis were notified to the DVFA: seven in pigs, one in a sheep and one in a goat. One case was notified due to clinical symptoms, and eight cases were notified because the animals had tested positive in a serological test performed under the surveillance programme. Official restrictions were imposed on all herds under suspicion while confirmatory laboratory testing was conducted. Samples of all suspected cases tested negative at the National Reference Laboratory.

The number of blood samples examined for brucellosis in the period 2017-2019 is given in Table 2.

The number of blood samples examined for brucellosis in the period 2017-2019 is given in Table 2.

***Brucella melitensis* has never been reported in Denmark, and Denmark has been recognised as being officially free from *B. melitensis* since 1995.**

## Foot and mouth disease

Denmark is recognised by the OIE as a country free from foot and mouth disease (FMD). Vaccination is prohibited, and FMD has not occurred in Denmark since 1983.

The main component of the Danish surveillance and early detection system for FMD is the animal disease notification system. The system for the notification of suspected cases of animal disease is described in Chapter 1 of this report.

In 2019, the DVFA was notified of one suspected case of FMD in cattle due to clinical symptoms. Official restrictions were imposed on the herd under suspicion while epidemiological investigation and laboratory testing were conducted. All samples tested free from FMD.

## Rabies

The rabies virus (classical rabies virus) has not been reported in domestic animals in Denmark since 1982. In wild animals, the last occurrence was in 1981.

Bat rabies, the European bat lyssavirus, was diagnosed for the first time in Denmark in 1985. The occurrence of bat rabies has been monitored since then. The last case of bat rabies in Danish domestic animals was diagnosed in sheep in 2002 and in Danish bats in 2009.

The monitoring of rabies is based on the testing of animals suspected of being infected with rabies and of bats which have been in contact with other animals or humans.

In 2019, eleven bats were tested, and all tested negative. Seven other animals (two cats, two foxes, one dog, one sheep and one cow) were submitted for examination. However, all animals tested negative.

In addition, active surveillance for rabies among bats is conducted. In 2019, saliva samples were collected from 88 bats living at different locations in Denmark. All saliva samples tested negative for European bat lyssavirus (EBLV-1 and EBLV-2).

## Trichinellosis

Infections with *Trichinella* spp. have not been reported in domestic animals in Denmark since 1930.

For more than 80 years, targeted tests have been performed in Denmark without finding any *Trichinella* spp. in pork or horse meat. In 2007, Denmark was classified as a region with a negligible risk of trichinellosis in herds of domestic pigs (Commission Regulation (EC) No 2075/2005). Although the designations of status and categories were changed in 2014 due to an amendment to the EU legislation (Commission Regulation (EC) No 216/2014), Denmark was allowed to maintain its surveillance programme for infections with *Trichinella* spp.

## Box 6

# Active surveillance for West Nile virus in Denmark

During the past few years, an increasing number of European countries have experienced outbreaks of infection with West Nile virus (WNV), and in 2019, several outbreaks in horses and birds were detected in zones in central and northern Europe with no history of WNV. As WNV may spread further north with migratory birds from endemic areas, surveillance activities are highly relevant to monitor whether the infection has reached Danish territories.

In 2019, the Danish Veterinary and Food Administration, the Technical University of Denmark, the SSI (Statens Serum Institut) and the Natural History Museum of Denmark (the University of Copenhagen) continued the ongoing surveillance for WNV in Denmark. Various material (avian tissue, blood samples and mosquitoes) was collected for surveillance:

Serum from poultry held outdoors (400 individuals) and migratory birds (322 individuals) was included in the serological surveillance programme and tested for WNV-specific antibodies. Altogether, 722 samples were examined, and one sample of serum from migratory birds (medium/long distance migratory species) was found

positive for WNV antibodies. This suggests that at least one of the migratory birds that stayed in or passed through Denmark in 2019 had been exposed to WNV at some time point in its previous life span, probably during its annual winter stay in Africa.

Further, mosquitoes collected through the insect vector surveillance programme mentioned in Box 5 (14 pools, or a total of 331 mosquitoes) were used to carry out virological surveillance for WNV. Also, brain tissue or other organ material from 88 wild birds found dead in nature was analysed for WNV. Testing of dead birds focused on species that are particularly sensitive to WNV. All samples tested negative. This means that no viral RNA was found in the material collected.

In conclusion, data from the 2019 surveillance programme indicate that there is not yet an active ongoing WNV infection in the Danish bird and mosquito populations. However, there is no doubt that migratory birds provide a link between WNV-endemic areas and Denmark. The material collected under this programme was tested in parallel for Usutu virus (USUV) and corresponding antibodies. All tests were negative.

# 722

**Altogether, 722 samples were examined, and one sample of serum from migratory birds (medium/long distance migratory species) was found positive for WNV antibodies.**



Photographer: Morten Scheller Jensen/www.nelfug.dk

**Table 3**  
Animals examined under the Danish trichinellosis surveillance programme, 2017-2019

Year	Pigs (incl. boars and sows)	Farmed wild boars*	Horses
2017	17,340,351	445	1,542
2018	17,956,829	575	1,334
2019	16,639,006	909	1,321

Source: Danish Veterinary and Food Administration Laboratory Division and other laboratories accredited to test for *Trichinella* spp.

\* Private hunted wild boars are included.

The Danish surveillance programme for demonstrating the absence of *Trichinella* spp. infections distinguishes between pigs kept indoors and pigs having access to outdoor facilities, the latter being considered a high-risk subpopulation. Older pigs, such as breeding animals, are also considered a high-risk subpopulation. However, sows and boars are still exempt from testing when kept under controlled housing conditions, as are also slaughtered fattening pigs reared under controlled conditions in integrated production systems.

Although comprehensive testing for *Trichinella* spp. is not required, the Danish pork meat industry has maintained a practice of testing all slaughtered fattening pigs, boars and sows as not all trading partners accept the above testing regime. Therefore, supplementary testing is performed, and this scheme is still under the control of the Danish competent authorities. All animals of susceptible

species slaughtered at Danish slaughterhouses are examined in accordance with the methods prescribed in Commission Implementing Regulation (EC) No 2015/1375.

The number of animals from each category of slaughtered animals examined under the Danish trichinellosis surveillance programme in the period 2017-2019 appears from Table 3.

Information pertaining to the OIE-listed multiple species diseases is given in Table 4.

The number of animals from each category of slaughtered animals examined under the Danish trichinellosis surveillance programme in the period 2017-2019 appears from Table 3.

Information pertaining to the OIE-listed multiple species diseases is given in Table 4.

**Table 4**

Last occurrence of OIE-listed multiple species diseases in Denmark

<b>Anthrax</b>	1988
<b>Bluetongue</b>	2008
<b>Crimean Congo haemorrhagic fever<sup>1</sup></b>	Never reported
<b>Epizootic haemorrhagic disease</b>	Never reported
<b>Equine encephalomyelitis (Eastern)</b>	Never reported
<b>Heartwater<sup>1</sup></b>	Never reported
<b>Infection with Aujeszky's disease virus</b>	1991
<b>Infection with <i>Brucella abortus</i>, <i>Brucella melitensis</i> and <i>Brucella suis</i></b>	Cattle: 1962 Pigs: 1999 Sheep and goats: Never reported
<b>Infection with <i>Echinococcus granulosus</i></b>	Not reported <sup>2</sup>
<b>Infection with <i>Echinococcus multilocularis</i></b>	2018 <sup>3</sup>
<b>Infection with foot and mouth disease virus</b>	1983
<b>Infection with rabies virus</b>	1982 <sup>4</sup>
<b>Infection with Rift Valley fever virus</b>	Never reported
<b>Infection with rinderpest virus</b>	1782
<b>Infection with <i>Trichinella</i> spp.</b>	1930
<b>Japanese encephalitis</b>	Never reported
<b>New World screwworm (<i>Cochliomya hominivorax</i>)<sup>1</sup></b>	Never reported
<b>Old World screwworm (<i>Chrysomya bezziana</i>)<sup>1</sup></b>	Never reported
<b>Paratuberculosis<sup>1</sup></b>	Disease present <sup>5</sup>
<b>Q fever</b>	Suspected, but not confirmed
<b>Surra (<i>Trypanosoma evansi</i>)<sup>1</sup></b>	Never reported
<b>Tularemia</b>	2016 <sup>6</sup>
<b>West Nile fever</b>	Never reported

<sup>1</sup> The disease is not notifiable in Denmark.

<sup>2</sup> Year of last outbreak not known.

<sup>3</sup> Detected in wildlife (fox).

<sup>4</sup> Infection with classical rabies virus in domestic animals.

<sup>5</sup> The disease is not officially controlled in Denmark; however, the cattle industry carries out a voluntary control programme.

<sup>6</sup> Detected in wildlife (rabbit).





# 2.2 Cattle diseases

In Denmark, 20% of the cattle farms are dairy farms and 80% produce beef. The trend towards fewer but larger dairy herds has been evident for many years. Dairy farms account for most of the production with approximately 560,000 milking cows producing approximately 5,610,000 tonnes of milk (2019 figures).<sup>3</sup> The rest of the herds comprise approximately 80,000 cows for beef production.

Denmark is recognised by the OIE as a country having a 'negligible BSE risk'. Bovine spongiform encephalopathy (BSE) has not been detected in Denmark since 2009.

Denmark is recognised by the EU as officially free from bovine tuberculosis, enzootic bovine leukosis and infectious bovine rhinotracheitis (IBR).

## Bovine spongiform encephalopathy (BSE)

Denmark became recognised as a country with a 'negligible BSE risk' in 2011. Even before 2011, Denmark was generally considered a country with a low risk of BSE due to very few cases of the disease. The status as a country with a negligible risk was granted on the basis of a comprehensive application documenting Danish compliance with the OIE requirements. The essential elements are:

- Risk assessment identifying historical and existing risks and showing that appropriate measures have been taken to manage each identified risk.
- The feed ban, which has been in place in Denmark since 1990 (ruminant-to-ruminant feed ban).
- The most recent tightening of the feed ban in January 2001, when processed animal proteins were banned in feed for production animals.
- No BSE cases in cattle born after the most recent tightening of the feed ban in January 2001.
- The comprehensive Danish BSE testing programme with a little over 2.7 million tests performed since the beginning of 2001.
- The long period of 20 years since the birth of the youngest Danish case of BSE.

<sup>3</sup> Source: SEGES.

## No BSE-positive animals have been born after the implementation of the total feed ban in 2001. This fact highlights the importance and effectiveness of the total feed ban.

No cases of BSE have been found in Denmark since 2009, when a BSE case was found in a 14-year old cow. During the period 2000-2009, a total of 18 cases of BSE were detected. The youngest Danish case of BSE was a cow born in 1999. No BSE-positive animals have been born after the implementation of the total feed ban in 2001. This fact highlights the importance and effectiveness of the total feed ban.

### Surveillance for BSE

In 1990, a passive surveillance programme for BSE was introduced in Denmark, and at the same time BSE was made a notifiable disease.

As BSE is a notifiable disease, anyone discovering symptoms of BSE in an animal must notify a veterinary practitioner and, hence, the Danish Veterinary and Food Administration (DVFA). BSE is suspected in animals showing clinical signs compatible with BSE or in case of a positive or inconclusive result of a rapid test performed under the surveillance programme. Confirmatory testing of material from the relevant animal is performed at the National Reference Laboratory. Meanwhile, the herd of origin is placed under movement restrictions, at least until the birth cohort of the suspected animal has been identified. Animals of the birth cohort are then placed under movement restrictions, both animals in the herd of origin and animals moved to other herds.

Additionally, if a rapid test of a slaughtered animal is positive, all parts of the animal are destroyed as specified risk material (SRM) irrespective of the result of the confirmatory test. At the slaughter line, the carcasses next to the test-positive animal are also destroyed as SRM (one carcass upstream - two carcasses downstream) if the final result is positive.

The current Danish BSE surveillance programme implements the most recent European TSE legislation laid down in Commission Regulation (EC) No 999/2001 as amended and Commission Decision 2009/719/EC as amended.

Active surveillance was implemented in October 2000, and from 2001 to 2009 the surveillance programme generally comprised the testing of:

- All clinical suspects (no age limit).
- All fallen stock, emergency-slaughtered animals and animals older than 24 months in which observations had been made of accidents or functional or neurological problems at the ante-mortem inspection at slaughter (AM animals).
- All healthy slaughter animals older than 30 months at slaughter.

The surveillance programme has been revised a few times since 2009 due to amendments to EU legislation. The latest revision was made in July 2013, when the testing of healthy slaughter animals was discontinued.

As from 4 July 2013, the surveillance testing regime for animals born in Denmark has comprised:

- All clinical suspects (no age limit).
- All fallen stock older than 48 months, emergency-slaughtered animals older than 48 months and animals older than 48 months in which observations were made of accidents or functional or neurological problems at the ante-mortem inspection at slaughter (AM animals).

Moreover, a more stringent testing regime has been implemented for animals from other EU Member States whose monitoring programmes have not been revised or from countries outside the EU which have a controlled or undetermined risk of BSE.

In 2019, one suspected case of BSE was notified to the DVFA due to clinical symptoms. Samples from the suspected case tested free from BSE.

An overview of the amendments to the Danish BSE surveillance programme is provided in Table 5.

The results of the Danish BSE surveillance programme in the period 2017-2019 are shown in Table 6.

An overview of the amendments to the Danish BSE surveillance programme is provided in Table 5.

The results of the Danish BSE surveillance programme in the period 2016-2018 are shown in Table 6.

**Table 5**  
Amendments to the Danish BSE surveillance programme as from 2001

<b>BSE testing in Denmark (periods)</b>	<b>Clinically suspected cases tested</b>	<b>Risk animals tested: emergency-slaughtered animals, fallen stock and AM animals</b>	<b>Healthy slaughter animals tested</b>
<b>1 July 2001 - 31 December 2008</b>	All (no age limit)	All > 24 months	All > 30 months
<b>1 January 2009 - 30 June 2011</b>		All > 48 months	All > 48 months
<b>1 July 2011 - 31 December 2012</b>			All > 72 months
<b>1 January 2013 - 3 July 2013</b>			Random samples > 72 months
<b>4 July 2013 -</b>			No testing

**Table 6**  
Results of the Danish BSE surveillance programme, 2017-2019

Category	2017		2018		2019	
	Animals tested	Positive animals	Animals tested	Positive animals	Animals tested	Positive animals
<b>Fallen stock</b>	21,036	0	22,272	0	22,872	0
<b>Emergency-slaughtered animals</b>	1,295	0	1,565	0	1,705	0
<b>AM animals</b>	0	0	0	0	0	0
<b>Healthy slaughter animals</b>	59	0	63	0	0	0
<b>Clinical suspects</b>	1	0	1	0	1	0
<b>Total</b>	<b>22,391</b>	<b>0</b>	<b>23,901</b>	<b>0</b>	<b>24,578</b>	<b>0</b>

Source: EFSA (the European Food Safety Authority), 2020.

## Bovine tuberculosis

Denmark has been recognised as officially free from tuberculosis in bovine herds since 1980 (Commission Decision 2003/467/EC).

The eradication of bovine tuberculosis in Denmark was initiated in 1893. In 1959, the eradication programme was replaced by a surveillance programme because only few outbreaks were diagnosed each year.

The last outbreak of tuberculosis in cattle occurred in 1988, the infection being of human origin. However, bovine tuberculosis was also diagnosed in farmed deer in 1988. A surveillance programme for bovine tuberculosis comprising all Danish herds of farmed deer was initiated in 1989. The last outbreak of tuberculosis in Danish farmed deer occurred in 1994.

The Danish surveillance programme demonstrating the absence of tuberculosis in cattle comprises

post-mortem examination of all slaughtered animals as part of the meat inspection programme at the slaughterhouses. Furthermore, bulls at semen collection centres are regularly tuberculin-tested in accordance with the provisions of Council Directive 88/407/EEC. Cattle intended for export to certain countries outside the EU are also tested. In 2019, approximately 1,800 animals were tested for bovine tuberculosis. All tested negative.

**Table 7**  
Bulk milk samples and blood samples examined under the Danish bovine virus diarrhoea surveillance programme, 2017-2019

Year	Bulk milk samples	Blood samples from beef herds
<b>2017</b>	12,708	25,209
<b>2018</b>	12,651	21,522
<b>2019</b>	12,927 <sup>1</sup>	20,918

Source: SEGES, 2020.

<sup>1</sup> 3,035 dairy herds in 2019 (Source: Central Husbandry Register).

## Bovine virus diarrhoea

Three Danish cattle herds had infections with Bovine virus diarrhoea (BVD) in 2019. Two of the infected herds were new cases detected in the year under review. Since those two herds had the same owner, they were considered as a single epidemiological unit. The infected herds were placed under official restrictions.

A voluntary control and eradication programme for BVD was implemented in Denmark in 1994. The voluntary programme was replaced in 1996 by a compulsory surveillance programme carried out jointly by the DVFA and the Danish cattle industry, represented by SEGES, the Danish Agriculture and Food Council. Legislation has been amended regularly to reflect the progress in the BVD eradication programme.

In 2006, the eradication programme had almost reached the end, and all herds except for a few were considered free from BVD. Movement restrictions were imposed on the remaining infected herds. Since 2006, BVD has reoccurred in few new herds almost every year.

The Danish BVD surveillance programme includes the testing of bulk milk samples from dairy herds and blood samples from beef herds for antibodies against BVD. Bulk milk samples are collected from all dairy herds four times a year. Cattle from beef herds are sampled at slaughterhouses following a computer-based selection of herds for sampling. Furthermore, bulls at semen collection centres are regularly tested according to the test regime required in accordance with the provisions of Council Directive 88/407/EEC.

## Box 7 Supplementary surveillance for brucellosis in cattle

The Danish Veterinary and Food Administration (DVFA) collaborates with the National Reference Laboratory to offer laboratory examination of bovine abortion material (foetus, placenta and blood sample from the mother cow).

In the post-mortem examination and microbiological and histological examinations, the samples are examined for brucellosis, bovine virus diarrhoea and any new emerging infections causing abortion in cattle. In 2019, 55 aborted foetuses from cattle underwent laboratory testing under this scheme.

The examination scheme is a supplement to the passive surveillance for bovine brucellosis, which provides additional documentation proving that Denmark is free from brucellosis in cattle.



In 2019, 11 suspected cases of BVD were notified to the DVFA. Nine cases were notified because the animals had tested positive in a serological test performed under the surveillance programme and two cases due to clinical symptoms. Official restrictions were imposed on all herds under suspicion while confirmatory laboratory testing was conducted at the National Reference Laboratory. Ten of the suspected herds tested free from BVD, while one herd and an epidemiologically linked herd were both diagnosed with BVD infection, as mentioned above.

The number of bulk milk samples and the number of blood samples from beef herds examined for BVD in the period 2017-2019 are given in Table 7.

### Enzootic bovine leukosis

Enzootic bovine leukosis (EBL) has not occurred in Denmark since 1990, and Denmark was declared officially free from EBL in 1991 (Commission Decision 2003/467/EC).

EBL has been notifiable in Denmark since 1959, and a surveillance programme was initiated the same year. For several years, the absence of EBL was demonstrated by tests of bulk milk samples every three years and by regular tests of blood samples collected at slaughter.

Since 2011, the Danish surveillance programme demonstrating the absence of EBL in cattle has comprised post-mortem examination of all slaughtered animals as part of the meat inspection

programme at the slaughterhouses. Furthermore, bulls at semen collection centres are regularly tested in accordance with the provisions of Council Directive 88/407/EEC. Cattle intended for export to certain countries outside the EU are also tested. In 2019, a total of 1,209 animals were tested.

In 2019, the DVFA was notified of three suspected cases of EBL. Two cases were suspected due to clinical symptoms and one case due to pathological findings at a post-mortem examination of a slaughtered animal. Official restrictions were imposed on the herds of origin while laboratory testing was conducted at the National Reference Laboratory. All suspected cases tested negative.

### Infectious bovine rhinotracheitis/ infectious pustular vulvovaginitis

Denmark was recognised as free from infectious bovine rhinotracheitis (IBR) in 1992 (Commission Decision 2004/558/EC).

Isolated outbreaks of IBR have occasionally occurred in Denmark. However, the official disease-free status has not been lost. The most recent case of IBR in Denmark was in a single animal diagnosed in 2005.

The national serological surveillance programme intended to demonstrate the absence of IBR was implemented in April 1984. The surveillance programme includes testing for IBR antibodies in bulk milk samples from dairy herds and blood samples



The number of bulk milk samples and the number of blood samples from beef herds examined for IBR in the period 2017-2019 are given in Table 8.

Information pertaining to the OIE-listed cattle diseases is given in Table 9.

from beef herds. Bulk milk samples are collected from all dairy herds. Cattle from beef herds are sampled at slaughterhouses following a computer-based selection of herds for sampling. In order to detect any introduction of IBR into Denmark, samples are collected from all cattle herds on the basis of the estimated risk of IBR. Due to the decreased risk of introduction from neighbouring countries, Danish dairy herds were tested only once in 2019. Furthermore, bulls at semen collection centres are regularly tested in accordance with the provisions of Council Directive 88/407/EEC. Cattle intended for export to certain countries outside the EU are also tested.

In 2019, the DVFA was notified of six suspected cases of IBR, two cases due to clinical symptoms and four cases because the animals had tested positive in a serological test performed under the surveillance programme. One case suspected due to clinical symptoms was rejected by the relevant Veterinary Inspection Unit (VIU) based on the evaluation of the clinical symptoms. Official restrictions were imposed on all herds under suspicion while laboratory testing was performed. Samples of all suspected cases tested negative for IBR at the National Reference Laboratory.

The number of bulk milk samples and the number of blood samples from beef herds examined for IBR in the period 2017-2019 are given in Table 8.

Information pertaining to the OIE-listed cattle diseases is given in Table 9.

**Table 8**  
Bulk milk samples and blood samples examined under the Danish infectious bovine rhinotracheitis surveillance programme, 2017-2019

Year	Bulk milk samples	Blood samples from beef herds
2017	13,017	14,571
2018	9,074	11,878
2019	3,056 <sup>1</sup>	12,039

Source: SEGES, 2020.

<sup>1</sup>3,035 dairy herds in 2019 (Source: Central Husbandry Register).

**Table 9**  
Last occurrence of OIE-listed cattle diseases in Denmark

<b>Bovine anaplasmosis<sup>1</sup></b>	Never reported
<b>Bovine babesiosis<sup>1</sup></b>	Suspected, but not confirmed
<b>Bovine genital campylobacteriosis<sup>1</sup></b>	1995
<b>Bovine spongiform encephalopathy (BSE)</b>	2009
<b>Bovine tuberculosis</b>	1994
<b>Bovine virus diarrhoea</b>	Disease present
<b>Enzootic bovine leukosis</b>	1990
<b>Haemorrhagic septicaemia<sup>1</sup></b>	Never reported
<b>Infection with <i>Mycoplasma mycoides</i> subsp. <i>mycoides</i> SC (contagious bovine pleuropneumonia)</b>	1886
<b>Infectious bovine rhinotracheitis (IBR)/ Infectious pustular vulvovaginitis (IPV)</b>	2005
<b>Lumpy skin disease</b>	Never reported
<b>Theileriosis<sup>1</sup></b>	Never reported
<b>Trichomonosis<sup>1</sup></b>	1990
<b>Trypanosomosis<sup>1</sup></b>	Never reported

<sup>1</sup>The disease is not notifiable in Denmark.

# 2.3 Sheep and goat diseases

Sheep and goats are kept under both intensive and extensive husbandry systems in Denmark, production being mainly for the domestic market.

Classical scrapie has never been reported in Denmark. However, few of the sheep and goat diseases listed by the OIE in 2019 have occurred in Denmark, such as Maedi-visna in sheep and caprine arthritis/encephalitis in goats. Maedi-visna and caprine arthritis/encephalitis are included in the voluntary control and surveillance programme for lentivirus.

## Caprine arthritis/encephalitis

Caprine arthritis/encephalitis is an enzootic infection most often recorded on the basis of serological findings. The disease is present in Danish goats.

A voluntary control programme for the lentivirus causing arthritis/encephalitis in goats was initiated in 1979 and is being managed by SEGES, the Danish Agriculture and Food Council. Herds included in this programme must be tested every three years

to maintain the disease-free status. The disease status of a herd has implications for the sale of live animals from that herd. It is recommended to identify and slaughter animals testing positive as well as their offspring, or to slaughter all animals of the herd if the infection is diagnosed.

In 2019, one of 556 goats tested was serologically positive (source: The Technical University of Denmark).







## Maedi-visna

The disease is present in Danish sheep. A voluntary programme for the lentivirus causing Maedi-visna in sheep was initiated in 1979 and is managed by SEGES. The control programme for Maedi-visna is similar to the programme for caprine arthritis/encephalitis.

In 2019, 2,170 sheep were tested, and one tested positive (source: The Technical University of Denmark).

## Transmissible spongiform encephalopathy

Denmark has never reported any cases of classical scrapie despite the comprehensive Danish surveillance programme for transmissible spongiform encephalopathies (TSEs). Since 2002, more than 70,000 animals have been tested for TSEs, which is quite a large number considering that the Danish population of sheep and goats is rather small (for population data see Chapter 4).

A passive surveillance programme was initiated in Denmark in 1988, and active surveillance began in 2002. From 1995 to 2002, a number of animals were tested in the voluntary scheme.

Atypical scrapie was first detected in Denmark in 2006. The most recent case of atypical scrapie was diagnosed in a seven-year old sheep in 2016

after five years without any cases. However, cases of atypical scrapie are not surprising as this disease can appear spontaneously in old animals.

TSE is suspected in case of a clinically suspected animal or a positive/inconclusive result of a rapid test, and the National Reference Laboratory investigates the test material from the animal. Meanwhile, official restrictions are imposed on the herd of origin and/or other herds in which the animal may have been exposed to TSE.

The Danish TSE surveillance programme implements the European TSE legislation as laid down in Commission Regulation (EC) No 999/2001. In 2003, Denmark initiated an extended national surveillance programme according to the EU rules at the time. According to the Danish programme, all fallen sheep and goats older than 18 months were tested, and Denmark was therefore granted additional guarantees regarding stringent import rules. In 2012, Denmark revised the national programme to become a testing scheme under which only a random sample of sheep and goats older than 18 months were tested, the reason being the substantial number of TSE tests performed during the preceding 8-year period without finding any cases of classical scrapie. The sample size depends on the size of the population and the rules laid down in the TSE Regulation (Council Regulation (EC) No 999/2001) as amended (Annex III).

Since 2002, more than 70,000 animals have been tested for TSEs.

## For countries with a national control programme for classical scrapie as Denmark, the most stringent EU rules on imports still apply.

**Table 10**  
Results of the Danish surveillance programme for TSEs in sheep, 2017-2019

Category	2017		2018		2019	
	Animals tested	Positive animals	Animals tested	Positive animals	Animals tested	Positive animals
<b>Animals not slaughtered for human consumption</b>	503	0	437	0	517	0
<b>Healthy slaughter animals</b>	1	0	1	0	0	0
<b>Cases of clinically suspected TSE</b>	1	0	1	0	0	0
<b>Total</b>	505	0	439	0	517	0

Source: EFSA (the European Food Safety Authority), 2020.

A major amendment to the TSE Regulation concerning imports was made in 2013 in order to approximate EU legislation and the OIE Terrestrial Animal Health Code. Denmark has maintained the status of a country with an extended surveillance programme, even though the TSE Regulation now refers to the programme as a national control programme for classical scrapie. For countries with a national control programme for classical scrapie as Denmark, the most stringent EU rules on imports still apply.

In 2019, one suspected case of TSE in a goat was notified to the DVFA. However, samples from the suspected case tested free from TSEs.

The results of the surveillance programmes for TSEs in sheep and goats in Denmark in the period 2017-2019 are shown in Tables 10 and 11.

Information pertaining to the OIE-listed diseases in sheep and goats is given in Table 12.

The results of the surveillance programmes for TSEs in sheep and goats in Denmark in the period 2017-2019 are shown in Tables 10 and 11.

Information pertaining to the OIE-listed diseases in sheep and goats is given in Table 12.

**Table 11**

Results of the Danish surveillance programme for TSEs in goats, 2017-2019

Category	2017		2018		2019	
	Animals tested	Positive animals	Animals tested	Positive animals	Animals tested	Positive animals
<b>Animals not slaughtered for human consumption</b>	106	0	98	0	110	0
<b>Healthy slaughter animals</b>	0	0	1	0	0	0
<b>Cases of clinically suspected TSE</b>	0	0	0	0	1	0
<b>Total</b>	106	0	99	0	111	0

Source: EFSA (the European Food Safety Authority), 2020.

**Table 12**

Last occurrence of OIE-listed sheep and goat diseases in Denmark

<b>Caprine arthritis/encephalitis</b>	Disease present
<b>Contagious agalactia<sup>1</sup></b>	Never reported
<b>Contagious caprine pleuropneumonia<sup>1</sup></b>	Never reported
<b>Infection with <i>Chlamydophila abortus</i> (Enzootic abortion of ewes, ovine chlamydiosis)<sup>1</sup></b>	Never reported
<b>Infection with peste des petits ruminants virus</b>	Never reported
<b>Maedi-visna</b>	Disease present
<b>Nairobi sheep disease<sup>1</sup></b>	Never reported
<b>Ovine epididymitis (<i>Brucella ovis</i>)<sup>1</sup></b>	Never reported
<b>Salmonellosis (<i>Salmonella abortusovis</i>)</b>	Never reported
<b>Scrapie (transmissible spongiform encephalopathy, classical scrapie)</b>	Never reported
<b>Sheep pox and goat pox</b>	1879

<sup>1</sup> The disease is not notifiable in Denmark.



# 2.4 Swine diseases

**The Danish pig production is characterised by large, industrialised pig farms. Approximately 3,500 Danish pig farms (one third of all pig farms but more than 90% of the breeding sow population) are run according to the pig industry's SPF programme.**

**Approximately 90% of the Danish pig production is exported either as live animals or as meat or meat products.<sup>4</sup>**

**African swine fever has never been reported in Denmark, and classical swine fever has not been reported in Denmark since 1933.**

## **African swine fever**

African swine fever (ASF) has never been reported in Denmark.

In 2013, ASF was approaching the borders of the EU from the east, as two outbreaks were reported in Belarus in June. In July, the EU implemented new legislation with the aim of reducing the risk of ASF spreading to the EU by transport vehicles entering the EU after having delivered live pigs to ASF-infected farms in countries along the eastern borders of the EU. The risk mitigating measures include the washing and disinfection of transport vehicles when they enter EU territory.

ASF reached the eastern territories of the EU in 2014. To prevent the disease from spreading any further, risk mitigating measures were put in place in the affected countries.

In 2019, 288 samples were tested under a supplementary surveillance programme for ASF (and classical swine fever (CSF)) in Denmark. All tested free from ASF and CSF. For further information, see Box 8.

If a pig shows clinical symptoms of ASF, CSF is also suspected. The Danish Veterinary and Food Administration (DVFA) was notified of six suspected cases of ASF (in five of the cases there was a suspicion of both ASF and CSF) in 2019. Five cases were reported due to clinical symptoms, and one case because an animal had a doubtful test result in a serological test for ASF performed prior to export. Official movement restrictions were imposed on the herds under suspicion while epidemiological investigation and laboratory testing were conducted. However, all samples tested free from ASF and CSF. Further details on the suspected cases are given under the heading of classical swine fever.

<sup>4</sup> Source: Danish Agriculture & Food Council.

## The public is encouraged to take part in the eradication of wild boars by reporting findings of animals to the DVFA.

### Initiatives to prevent the introduction of African swine fever into Denmark

Denmark has closely monitored the development and spread of African swine fever (ASF) since the outbreak of the disease in the Baltics in February 2014. Recent developments have therefore led to a more cautious and preventive approach as an attempt to curb the threat.

To mitigate the risk, Denmark has developed an action plan. The action plan consists of many measures, which are intended, in combination, to reduce the risk of ASF virus on Danish territory. The measures comprise veterinary actions and actions to eradicate wild boars in Denmark. The main elements appear from the following.

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**In 2019, 288 samples were tested under a supplementary surveillance programme for ASF (and classical swine fever) in Denmark.**

Veterinary actions:

- Further strengthening of the Danish veterinary disease control.
- Information initiatives on biosecurity, food litter and kitchen offal.
- Information signs at pull-outs from motorways giving instructions on risk mitigating measures and on the general prohibition of swill feeding.
- Large fines for illegal importation of food from third countries and for failure to properly clean transport vehicles returning from ASF-infected areas due to the risk of introduction of ASF.

Eradication of wild boars in Denmark:

- Intensive efforts to eradicate free-living wild boars in Denmark.
- License to hunt wild boars 24 hours a day.
- Construction of a wild boar fence along the Danish border to Germany to prevent the crossing of wild boars.
- Increased surveillance for ASF in the wild boar population through the offer of free testing of caught wild boars for *Trichinella* spp.
- Strengthening of the cooperation with the Danish Hunters' Association.



The public is encouraged to take part in the eradication of wild boars by reporting findings of animals to the DVFA. This can easily be done by using the smartphone app 'VildsvineTip' (in English: Wild Boar Tip-off). Notifications of both dead and live animals are stored in the wild boar database. Each record comprises the date, type of the finding (e.g. dead or alive), number of animals, geographical location and a photo of the animal(s) or traces of their presence. Information on live animals is forwarded to the Danish Nature Agency, which organises the hunting of wild boars and makes entries about the animals killed in the database. The relevant Veterinary Inspection Unit (VIU) then collects samples from the dead wild boars (whether shot, road-killed and otherwise deceased) for testing, and the laboratory enters the test results into the database. Hunters are offered free testing of hunter-killed wild boars. The samples are tested for ASF, CSF, Aujeszky's disease and *Trichinella* spp. The person reporting the wild boar will also be notified of the test results through the app. Carcasses of dead wild boars are collected and disposed of. All results are publicly available at [www.vildsvin.fvst.dk](http://www.vildsvin.fvst.dk) (in Danish). The findings of wild boars reported in 2019 are illustrated in Figure 1.

### Classical swine fever

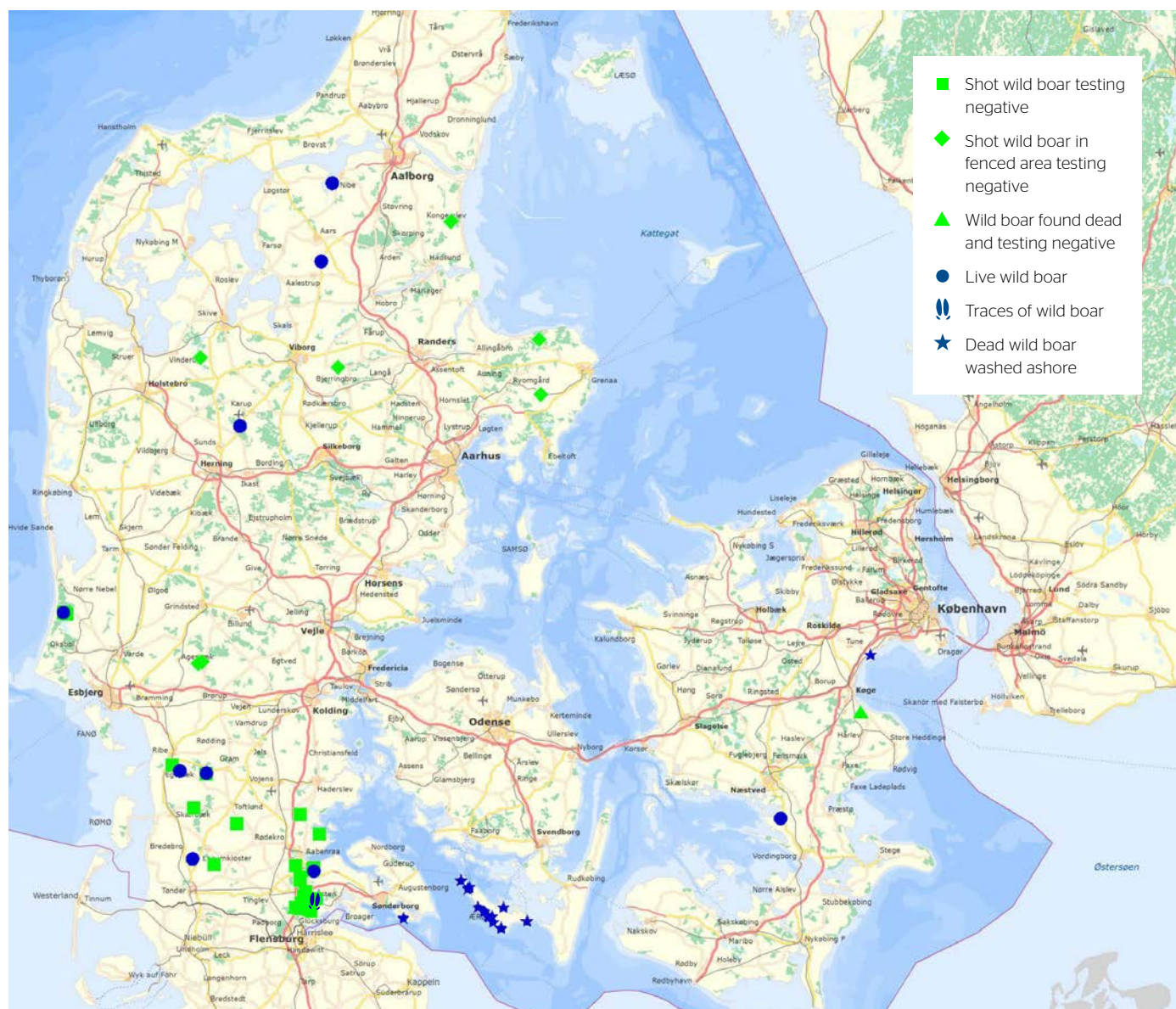
The last outbreak of classical swine fever (CSF) in Denmark was in 1933.



A serological surveillance programme is applied to demonstrate the absence of CSF in the Danish pig population. The surveillance programme was revised in 2012 on the basis of a comprehensive risk assessment. Since the revision of the serological surveillance programme, the following three components have been included in the programme:

- Random sampling of a maximum of 2% of sows at slaughter.
- Targeted testing of boars at semen collection centres in accordance with Council Directive 90/429/EEC.
- Sampling of animals intended for export to certain countries outside the EU.

**Figure 1**  
Findings of wild boars tested for ASF, CSF, Aujeszky's disease and *Trichinella* spp. in 2019.



As a supplement to the serological surveillance, pig carcasses submitted for post-mortem examination are tested for CSF and ASF. Further details are given in Box 8.

Due to fluctuations in trade, the number of samples tested for CSF changed significantly during the period under review. The number of samples examined in the period 2017-2019 is given in Table 13.

**Table 13**  
Serum samples from pigs examined under the Danish classical swine fever surveillance programme, 2017-2019

<b>Year</b>	<b>Samples</b>
<b>2017</b>	35,705
<b>2018</b>	23,658
<b>2019</b>	31,940

Source: The Technical University of Denmark, the SSI (Statens Serum Institut) and other official laboratories in the EU, 2020.

## Box 8

# Supplementary surveillance for African swine fever and classical swine fever

Samples from carcasses of swine submitted from pig farms for general post-mortem examination at the diagnostic laboratory are included in the surveillance programme for African swine fever (ASF) and classical swine fever (CSF) as a supplement to serological surveillance.

Carcasses are selected by laboratory staff on the basis of the anamnesis, and relevant organ material is collected for the testing for ASF and CSF. If a sample tests positive, the result is immediately reported to the Danish Veterinary and Food Administration (DVFA) as a suspected case of ASF or CSF.

On a weekly basis, samples from at least six pig herds are tested for ASF and CSF under this programme. In 2019, samples from 288 submissions were tested; all tested free from ASF and CSF.



## If a pig shows clinical symptoms of CSF, ASF is also suspected.

If any animals in a herd show clinical symptoms which give rise to the suspicion of CSF, the herd will be placed under official restrictions while laboratory testing and epidemiological investigations are conducted. If a pig shows clinical symptoms of CSF, ASF is also suspected.

In 2019, five suspected cases of CSF (or ASF) were notified to the DVFA. One case was suspected due to clinical signs in pigs at the ante-mortem inspection at a slaughterhouse, and four cases were reported due to clinical symptoms in animals in herds. In all suspected cases, the herd of origin was subjected to thorough clinical examination and laboratory testing. The relevant Veterinary Inspection Unit (VIU) imposed official restrictions on the herds under suspicion while epidemiological investigation and laboratory testing were conducted. All samples tested free from CSF and ASF.

Information pertaining to the OIE-listed diseases in pigs is given in Table 14.

**Table 14**

Last occurrence of OIE-listed swine diseases in Denmark

<b>African swine fever</b>	Never reported
<b>Infection with classical swine fever virus</b>	1933
<b>Infection with <i>Taenia solium</i> (Porcine cysticercosis)</b>	Not reported <sup>1</sup>
<b>Nipah virus encephalitis</b>	Never reported
<b>Porcine reproductive and respiratory syndrome (PRRS)</b>	Disease present <sup>2</sup>
<b>Transmissible gastroenteritis</b>	Never reported

<sup>1</sup> Year of last outbreak is not known.

<sup>2</sup> PRRS is endemic in Denmark.



## Box 9

# No porcine epidemic diarrhoea virus in Denmark

Porcine epidemic diarrhoea (PED) has never been recorded in Denmark despite the wide distribution of PED in central and southern Europe since the 1990s.

PED is not a notifiable disease in Denmark. The symptoms are similar to those of transmissible gastroenteritis (TGE), which is a notifiable disease that has never been reported in Denmark. This means that even though PED is not notifiable in Denmark, potential cases of PED would most likely have been detected because of the obligation to report suspected cases of TGE.

Due to the increased focus on PED in northern America in 2013, a serological screening of blood samples from sows for PED was initiated by the Danish Veterinary and Food Administration (DVFA) in 2014, using samples collected under the surveillance programmes for Aujeszky's disease and classical swine fever.

From October to December 2014, approximately 2,000 blood samples were tested in a PED ELISA developed by the Technical University of Denmark. The ELISA was developed to detect both the original European and the Asian/American

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**In 2019, 75 samples from piglets with diarrhoea were subjected to a PCR test, and 482 blood samples from pigs were subjected to serological testing.**

strains. All samples tested negative. The samples originated from 1,352 sow herds. In statistical terms, it was concluded with 92% certainty that the prevalence of the PED virus in Denmark was less than 1% at the end of 2014.

In 2015, the pig farming industry took over responsibility for the surveillance scheme. Material from carcasses of piglets with diarrhoea submitted for post-mortem examination is included in the PED surveillance scheme as a supplement to serological surveillance. In 2019, 75 samples from piglets with diarrhoea were subjected to a PCR test, and 482 blood samples from pigs were subjected to serological testing. All samples tested negative for PED.



# 2.5 Poultry diseases

**The poultry production in Denmark comprises two major categories: table egg production and meat production. There is a standing population of 3.8 million laying hens and 120 million broilers in Denmark.<sup>5</sup>**

**Only few poultry diseases listed by the OIE occurred in Denmark in 2019.**

**The EU-coordinated surveillance programme for avian influenza (AI) in poultry as revised in 2015 continued in 2019.**

## Avian influenza

No outbreaks of highly pathogenic avian influenza (HPAI) were reported in poultry and other captive birds in 2019.

However, HPAI H5N6 was detected in a dead buzzard in 2019.

Three outbreaks of low pathogenic avian influenza (LPAI) were detected in holdings with poultry in 2019. See below for more information.

In October 2019, Denmark regained its status as a country free from notifiable avian influenza according to the OIE Terrestrial Animal Health Code. The status was maintained during the rest of 2019.

Avian influenza (AI) H5/H7 is notifiable in Denmark according to national legislation. Veterinarians and farmers are obliged to notify the Danish Veterinary

and Food Administration (DVFA) immediately in case of clinical signs of AI.

If poultry show clinical signs of AI, official restrictions are imposed on the farm while an epidemiological investigation of the flock is carried out and laboratory testing is conducted.

In 2019, three suspected cases of AI were notified to the DVFA due to clinical symptoms. Two cases were rejected by the relevant Veterinary Inspection Unit (VIU) based on a thorough evaluation of the clinical symptoms. The last case tested negative in a virological test. Furthermore, 15 suspected cases of AI were notified to the DVFA because birds had tested positive in a serological test performed under the serological surveillance programme for AI. In the subsequent virological tests, two cases tested positive for LPAI. In the virological surveillance programme for AI, one flock tested positive for LPAI H5. More information on these three outbreaks is provided below.

<sup>5</sup> Source: Danish Agriculture & Food Council.

**Table 15**

Low pathogenic avian influenza (LPAI) in poultry, Denmark, 2019

Outbreak number	Municipality	Confirmed date	Virus type	Number of susceptible birds	Species	Type of holding	Approval of cleaning and disinfection, date
1	Rebild	28/02/2019	LPAI H5N1	7,276	<i>Gallus gallus</i>	Free-range laying hens	04/03/2019
2	Middelfart	14/03/2019	LPAI H7N7	2,828	Mallards	Game birds for restocking	17/03/2019
3	Naestved	28/06/2019	LPAI H5N1	5,193	Mallards	Game birds for restocking (offspring)	01/07/2019

### Low pathogenic avian influenza in three flocks

In 2019, three outbreaks of subclinical infection with LPAI occurred in Denmark on 28 February, 14 March and 28 June 2019, respectively. The outbreaks were detected under the Danish surveillance programme for AI in poultry and game birds and were promptly reported to the OIE through the WAHIS (World Animal Health Information System). A stamping-out policy was applied in all three outbreaks.

During the suspicion period, the holdings were placed under movement restrictions.

Immediately after the confirmation of LPAI, the DVFA established a restriction zone of 1 km around the infected holdings and implemented the necessary measures in accordance with Council Directive 2005/94/EC and national legislation.

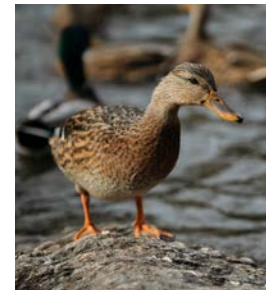
The following measures were applied on the infected holdings:

- All poultry were immediately killed, and the carcasses were disposed of by rendering.
- The cleaning and disinfection of buildings, equipment, vehicles etc. were initiated immediately after the killing. The cleaning and disinfection of the last infected holding was approved on 1 July 2019.
- An epidemiological investigation was conducted.

Information on the three LPAI-infected flocks is provided in Table 15.

In the three outbreaks, contact holdings were traced and tested for AI; all samples tested negative for AI. The epidemiological investigation of the outbreaks concluded that the most likely cause of the disease was contact with wild birds.

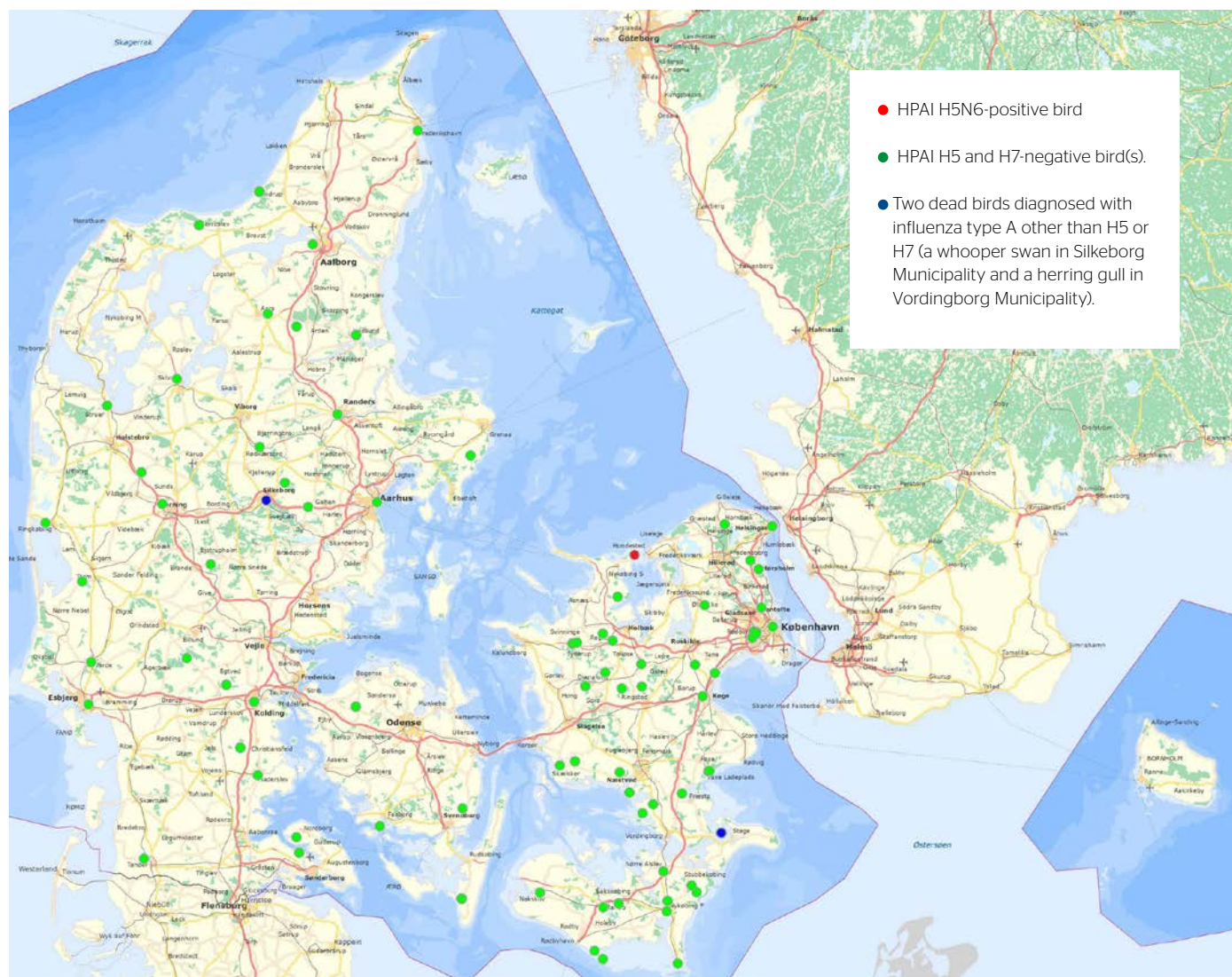
There were no other commercial poultry holdings in the restriction zone. However, in connection with the first and third outbreaks, hobby poultry flocks were registered in the restriction zone. The hobby flocks



Information on the three LPAI-infected flocks of birds is provided in Table 15.



**Figure 2**  
Dead wild birds tested for avian influenza in 2019.



Note that dead birds found in close geographical and temporal proximity of each other are only represented on the map by one dot.

were placed under the supervision of the relevant Veterinary Inspection Unit (VIU) of the DVFA.

Denmark handled the LPAI outbreaks as prescribed by Council Directive 2005/94/EC, taking the precautionary approach. All birds in the affected holdings were killed in order to mitigate the risk of mutation or reassortment of the AI virus.

The last restriction zone was lifted on 23 July 2019.

### **The surveillance programme for avian influenza in poultry and game birds for restocking**

The Danish surveillance programme for AI in poultry and game birds for restocking was established to detect AI virus of subtype H5 or H7 circulating in the poultry population. Consequently, when positive serological findings are reported, the relevant holdings will be subjected to further testing in order to detect whether the virus is circulating. In holdings where avian influenza (AI) H5/H7 virus is detected, all birds will be killed, and the infected premises/establishment will be subjected to cleaning and disinfection.

Surveillance for AI has been in place throughout the country since 2006. Initially, the surveillance programme comprised two levels: a standard level of testing all over the country and an intensified level of testing in an area extending 3 km inland from the coastline and from the shore of all large lakes.



The surveillance programme was revised in 2015 following a risk assessment. Subsequently, the surveillance level has been the same all over the country without any specific risk areas defined. All commercial holdings in the target group having more than 100 animals are included in the programme. Breeder hens (central rearing flocks) and pullets are tested before release to egg production, outdoor layers four times a year and outdoor slaughter poultry (broilers, ducks and geese) before slaughter. In addition, fattening turkeys are tested before slaughter. Breeder ducks and geese are required to be tested once a year.

Farmed game birds for restocking (gallinaceous birds and waterfowl) are tested four times during the production season from February to August.

The surveillance programme was revised in 2015 following a risk assessment.

Subsequently, the surveillance level has been the same all over the country without any specific risk areas defined.

Breeding animals undergo serological testing and their offspring virological testing.

When traded, poultry and game birds have to be accompanied by a certificate stating that the flock has been tested within the preceding three months in case of poultry, or two months in case of game birds.

The surveillance programme is mainly based on serology. PCR testing is used only for offspring from game birds. Additionally, PCR testing is used in case of a positive serological result to confirm whether the relevant flock is infected by the AI virus.

In total, 15 holdings/flocks tested positive for AI H5 under the serological surveillance programme in 2019. Some of the positive holdings/flocks tested positive more than once in 2019, which means that the number of serological positive holdings/flocks can be reduced to 13. Two of them also tested positive in the following virological test (LPAI). Furthermore, under the virological surveillance programme for poultry intended for restocking of wild game birds, one holding of offspring tested positive for LPAI H5. A detailed description of all three cases is given above.

As a supplement to the surveillance of AI, a special early warning programme for AI is in place. For more information, see Box 10 in this chapter.

## **Box 10**

### **Early warning scheme - a supplement to the surveillance of avian influenza**

EU surveillance programmes for avian influenza (AI) in poultry and wild birds have been in place in Denmark since 2003. As a supplement to these programmes, a special programme for early warnings of AI in commercial poultry and hobby poultry has been in place since 2005. All samples tested due to an early warning of AI are also tested for Newcastle disease (ND) as a differential diagnosis.

The AI early warning parameters requiring the owner of the animals to notify are:

- Drop in feed and water intake by more than 20% in 24 hours.
- Drop in egg production by more than 5% for more than two consecutive days.
- Mortality rate higher than 3% in any unit during a three-day period.

Early warnings are notified to the DVFA, and samples are collected from ten birds of the flock for virological examination.

Eight early warnings of AI were notified to the DVFA in 2019. One of the cases was rejected after a thorough assessment of the anamnesis. All samples from the seven other cases tested free from AI and ND.

The results of the Danish surveillance programme for AI in poultry and game birds for restocking are shown in Table 16.

### The surveillance programme for avian influenza in wild birds

In 2019, the DVFA continued the intensive surveillance programme for AI in wild birds.

Since January 2011, the surveillance programme for AI in wild birds has been divided into an EU-coordinated passive surveillance programme for HPAI in wild birds found dead or sick and active national surveillance for AI in live birds with an increased risk of exposure to AI and hunted game birds. Birds sourced from passive surveillance are tested individually, and birds sourced from active surveillance are tested by cloacal swabs in pools taken from up to five birds of the same species at the same time and location.

The DVFA encourages the public to report findings of dead wild birds. This can easily be done by using the smartphone app 'FugleinfluenzaTip' (in English: Bird Flu Tip-off).

In total, 111 dead wild birds were submitted for laboratory testing in 2019 (passive surveillance), most of them in the first quarter of the year.

The monitoring of dead wild birds covered the whole country; however, only one dead wild bird with HPAI H5N6 was detected (see Figure 2). The wild birds were tested at the National Reference Laboratory.

Under the active surveillance programme, 238 pools of cloacal swabs were analysed; however, none of the live wild birds tested positive for HPAI.

The results are displayed in Table 17.

Under the active surveillance programme, 238 pools of cloacal swabs were analysed; however, none of the live wild birds tested positive for HPAI.

The results are displayed in Table 17.



As a supplement to the surveillance of AI, a special early warning programme for AI is in place. For more information, see Box 10 in this chapter.

**Table 16**

Results of the Danish surveillance programme for avian influenza in poultry and game birds for restocking, 2019

Poultry category	Holdings (h)/ flocks (f) in Denmark <sup>1</sup>	Holdings (h)/ flocks (f) tested <sup>2</sup>	Serologically positive holdings/flocks (H5, H7)			Virologically positive holdings/flocks	
			H5	H7	H5 and H7	H5	H7
<b>Chicken breeders</b>	191 (f)	164 (f)	0	0	0	-	-
<b>Free-range laying hens</b>	186 (f)	151 (f)	10 <sup>3</sup>	0	1	1	0
<b>Free-range broilers</b>	100 (h)	30 (h)	0	0	0	-	-
<b>Fattening turkeys</b>	63 (h)	14 (f)	0	0	0	-	-
<b>Fattening geese</b>	14 (h)	3 (h)	0	0	0	-	-
<b>Fattening ducks</b>	81 (h)	17 (h)	0	0	0	-	-
<b>Mallards bred for restocking of game birds</b>	21 (h)						
<b>- Breeding animals</b>		7 (h)	1	0	1	0	1
<b>- Offspring</b>		14 (h)	-	-	-	1	0
<b>Pheasants, partridges, rock partridges and red-legged partridges</b>	85 (h)						
<b>- Breeding animals</b>		27 (h)	2	0	0	0	0
<b>- Offspring</b>		50 (h)	-	-	-	0	0
<b>Total positives</b>			<b>13</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>1</b>

Source: The Poultry Database of the Danish Agriculture & Food Council, 2020.

<sup>1</sup> Each holding/flock is registered with more than 100 animals. The holdings/flocks do not necessarily have active production throughout the year.

<sup>2</sup> Some flocks/holdings are tested more than once a year; the figures only include one annual testing per flock/holding, except that all positive results are included even in case the same holding tested positive more than once in the year under review.

<sup>3</sup> Some holdings tested serologically positive more than once in the year under review.

**Table 17**

Results of the Danish surveillance programme for avian influenza in wild birds, 2019

	<b>Passive surveillance (dead or sick wild birds)</b>	<b>Active surveillance (live wild birds)</b>
<b>Birds sampled</b>	111	892
<b>Samples/pools</b>	111 samples	238 pools <sup>1</sup>
<b>Influenza A-positive birds</b>	3	70 pools <sup>2</sup>
<b>LPAI H5-positive birds</b>	0	4 pools <sup>2</sup>
<b>LPAI H7-positive birds</b>	0	0
<b>HPAI H5/H7-positive birds</b>	1	0

Source: SSI (Statens Serum Institut) and the University of Copenhagen, 2020.

<sup>1</sup> Pools of cloacal swabs taken from up to five birds of the same species at the same time and location.<sup>2</sup> The actual number of positive birds is not known. If a pool is positive, at least one of the pooled birds is positive.**Table 18**

Outbreaks of poultry diseases listed by the OIE and notifiable in Denmark, 2017-2019

<b>Poultry disease</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<b>Avian chlamydiosis<sup>1</sup></b>	3	9	18
<b>Avian infectious laryngotracheitis<sup>1</sup></b>	6	2	4
<b>Avian mycoplasmosis (<i>Mycoplasma gallisepticum</i>)</b>	(1967)	(1967)	(1967)
<b>Fowl typhoid</b>	(2002)	(2002)	(2002)
<b>Infection with highly pathogenic avian influenza viruses (poultry)</b>	(2016)	(2016)	(2016)
<b>Infection with highly pathogenic avian influenza A virus (other captured birds)</b>	1	(2017)	(2017)
<b>Infection with low pathogenic avian influenza viruses</b>	(2016)	2	3
<b>Infection with Newcastle disease virus</b>	(2005)	(2005)	(2005)
<b>Pullorum disease<sup>2</sup></b>	(2010)	(2010)	2

The year of the last occurrence is stated in brackets if there were no outbreaks of the disease in the relevant year.

<sup>1</sup> Occurrence mainly in ornamental, hobby and backyard birds.<sup>2</sup> Two outbreaks were detected in flocks of farmed game birds (pheasants).

**Table 19**

Last occurrence of other OIE-listed poultry diseases not notifiable in Denmark

<b>Avian infectious bronchitis</b>	Suspected, but not confirmed
<b>Avian mycoplasmosis (<i>Mycoplasma synoviae</i>)</b>	Not reported <sup>1</sup>
<b>Duck virus hepatitis</b>	Suspected, but not confirmed
<b>Infectious bursal disease (Gumboro disease)</b>	2015
<b>Turkey rhinotracheitis</b>	2007

<sup>1</sup> Year of last outbreak is not known.

## Newcastle disease

The last outbreak of Newcastle disease (ND) in Denmark occurred in October 2005.

Prophylactic vaccination against ND is compulsory for hens and turkeys in both breeding and layer flocks. Vaccination is also compulsory for flocks of broilers kept free-range or slaughtered when older than ten weeks and for turkeys for commercial production. Also poultry brought to gatherings, exhibitions and markets and wintering game birds for breeding the following spring must be vaccinated against ND.

If poultry show clinical symptoms of AI, ND is also suspected, and official restrictions are imposed on the farm while an epidemiological investigation of the flock is carried out and laboratory testing is conducted. In practice, this means that all holdings suspected of an infection with AI due to clinical symptoms, or tested in the early warnings scheme, are tested for both ND and AI.

Due to the comprehensive vaccination programme against ND in Denmark, this disease is usually not the primary suspicion in case of clinical disease in poultry. However, as a precautionary measure, suspected cases are tested for ND in order to rule out the presence of the virus.

In 2019, one suspected case of ND was reported in a backyard flock due to clinical symptoms; however, no circulating virus was detected in the virological test.

Information pertaining to the OIE-listed poultry diseases is given in Tables 18 and 19.



In 2019, one suspected case of ND was reported in a backyard flock due to clinical symptoms; however, no circulating virus was detected in the virological test.

Information pertaining to the OIE-listed poultry diseases is given in Tables 18 and 19.

# 2.6 Equine diseases

The keeping of horses in Denmark is based on more than 30 different breeds, which are used for driving, riding and other purposes. Riding horse breeding focuses on the breeding of horses suitable for competition at an international level.

Few of the OIE-listed equine diseases are known to be present in Denmark; however, equine viral arteritis is notifiable and suspected to be present in Denmark, but the infection has not been confirmed.

## Contagious equine metritis

Infection with *Taylorella equigenitalis*, which causes contagious equine metritis (CEM), was diagnosed in two horses in Denmark in 2019. Microbiological examination of samples from horses is carried out in connection with breeding and international trade in horses and horse semen.

## Dourine

Dourine, which is caused by the protozoan parasite *Trypanosoma equiperdum*, has never been reported in Denmark. Serological examination is carried out in connection with international trade in horses and horse semen.

## Equine infectious anaemia

Equine infectious anaemia (EIA) has not been reported in Denmark since 1928. Serological examination is carried out in connection with international trade in horses and horse semen.

## Glanders

Glanders, which is caused by an infection with the *Burkholderia mallei* bacterium, has not been reported in Denmark since 1928. Serological examination is carried out in connection with international trade in horses and horse semen.

Information pertaining to equine diseases is given in Table 20.

**Glanders, which is caused by an infection with the *Burkholderia mallei* bacterium, has not been reported in Denmark since 1928.**

Information pertaining to equine diseases is given in Table 20.





**Table 20**

Occurrence of OIE-listed equine diseases in Denmark

<b>Contagious equine metritis</b>	Disease present
<b>Dourine</b>	Never reported
<b>Equine encephalomyelitis (Western)</b>	Never reported
<b>Equine infectious anaemia</b>	1928
<b>Equine influenza<sup>1</sup></b>	Suspected, but not confirmed <sup>2</sup>
<b>Equine piroplasmosis<sup>1</sup></b>	Not reported <sup>3</sup>
<b>Glanders</b>	1928
<b>Infection with African horse sickness virus</b>	Never reported
<b>Infection with equid herpesvirus-1 (EHV-1)<sup>1</sup></b>	Disease present
<b>Infection with equine arteritis virus</b>	Not reported
<b>Venezuelan equine encephalomyelitis</b>	Never reported

<sup>1</sup> The disease is not notifiable in Denmark.

<sup>2</sup> Due to widespread vaccination of competition horses and racehorses, incidents among those horses are rare and of a mild nature.

<sup>3</sup> Year of last outbreak is not known.



# 2.7 Fur animal diseases

In 2019, 1,244 mink farms were registered in Denmark and the annual production of skin exceeded 13 million skins.<sup>6</sup>

During the past years, consumer demand for animal welfare in modern Danish farming has increased. The industry has therefore collaborated with animal welfare experts to prepare guidelines for fur animal welfare, which formed the basis for national legislation enacted in 2007.

All Danish mink farms undergo annual, mandatory inspections by an authorised veterinarian as set out in legislation. The inspections (4-5 each year) are routine inspections to identify potential health or welfare issues on the farm.

Mink farms are also regularly inspected by veterinary officers from the Danish Veterinary and Food Administration (DVFA).

In addition to the production of mink, Denmark also has a very small commercial production of rabbits; however, most rabbits are held as pets. The populations of wild rabbits are assumed to be limited in number and only in restricted areas.

In total, Denmark exported more than 167,000 fur animals in 2019.

<sup>6</sup> Source: Copenhagen Fur (owned by the Danish Fur Breeders' Association).



## Myxomatosis

Until 2007, myxomatosis in rabbits occurred sporadically in Denmark, both in wild and in pet rabbits. In wild rabbits, myxomatosis occurred only in the southern part of Jutland and on some isolated islands. In 2007, many outbreaks of myxomatosis occurred in Danish pet rabbits, most cases being on Zealand.

Vaccination against myxomatosis has been allowed in Denmark since 2008. In 2010, myxomatosis was de-listed and made a non-notifiable disease.

## Rabbit haemorrhagic disease

Rabbit haemorrhagic disease (RHD) in rabbits is a notifiable disease in Denmark.

In 2019, RHD was diagnosed in five pet holdings of rabbits where several rabbits had died. The wild population is considered a reservoir for the disease.

## Box 11 Disease control in mink farms

The Danish mink farming industry has implemented control and eradication programmes for infectious diseases that previously caused heavy losses for farmers. Infection with Aleutian disease virus is notifiable in Denmark, and legislation has been put in place to support the programme for the prevention of future virus infection.

### Aleutian disease (mink plasmacytosis)

The Danish control programme for Aleutian disease is run by the Danish Fur Breeders' Association. Outbreaks occur rarely. In 2019, few serologically positive animals were registered at less than 40 farms in northern Jutland north of the Limfjord. South of the Limfjord, only two infected farms were detected in 2019.

As set out in the control programme, the infected herds were culled, and the farms were cleaned and disinfected.

**The Danish mink farming industry has implemented control and eradication programmes for infectious diseases that previously caused heavy losses for farmers.**



# 2.8 Fish diseases

In 2019, 219 aquaculture production businesses (APBs) producing fish were registered in Denmark. The majority were freshwater fish farms, but 19 of the 219 APBs were marine fish farms producing rainbow trout in net cages, and 10 APBs produced fish in saltwater tanks/raceways. The marine fish farms are located in the Belt Sea, south and west of Zealand, along the eastern coast of Jutland and near the island of Samsø.

## The Danish aquaculture surveillance programme

Since 1970, Denmark has had an official disease surveillance programme comprising all fish farms in the country. Common EU legislation on animal health conditions governing the placing on the market of aquaculture animals was introduced by Council Directive 2006/88/EC. Since then, the surveillance programme has been conducted according to the provisions laid down in this Directive.

The aquatic animal health surveillance in Denmark consists of the following components: the obliga-

tion to notify suspicions of animal diseases, the obligation to notify unsuspected, increased mortality, routine inspections and laboratory examination of surveillance samples.

In 2019, the Danish Veterinary and Food Administration (DVFA) carried out approximately 200 inspections of fish farms. The surveillance samples (including export samples) tested in 2019 are described in Table 21.

Each sample tested is a pooled sample of up to ten fish. The most common species tested is rainbow trout, which constitutes approximately 97% of the production of salmonids in Danish fish farms. Brown trout (*Salmo trutta*) and brook trout (*Salvelinus fontinalis*) are also produced in some freshwater fish farms. These species are therefore also tested under the surveillance programme. Samples from wild salmon (*Salmo salar*) and brown trout (*Salmo trutta*) are also collected for testing under the surveillance programme. A few aquaculture farms produce species such as zander, turbot

The surveillance samples (including export samples) tested in 2019 are described in Table 21.

# 200

In 2019, the Danish Veterinary and Food Administration (DVFA) carried out approximately 200 inspections of fish farms.

and eel. Those species are also sampled and tested for viral haemorrhagic septicaemia (VHS) virus and infectious haematopoietic necrosis (IHN) virus. The types of tissue sampled and the testing methods are also specified in Table 21.

### Infectious haematopoietic necrosis

Infectious haematopoietic necrosis (IHN) has never been reported in Denmark, and the whole territory is approved free from IHN by the European Union (Commission Decision 2009/177/EC).

### Infectious salmon anaemia

Infection with HPR-deleted infectious salmon anaemia (ISA) virus has never been reported in Denmark, and the whole territory is approved free from ISA by the European Union (Commission Decision 2009/177/EC).

In February 2019, Infection with HPRO infectious salmon anaemia virus was detected in a wild Atlantic salmon (*Salmo salar*) in a facility for restoration of wild salmon in Randers Municipality. The salmon was caught in the river of Gudenåen. The fish and its eggs were destroyed, and the relevant parts of the facility were cleaned and disinfected.

**Table 21**

Number of surveillance samples (including export samples) tested under the Danish aquaculture surveillance programme in 2019

Disease	Type of tissue sampled <sup>1</sup>	Testing method <sup>2</sup>	Number of samples tested in 2019 <sup>3</sup>
<b>Epizootic haematopoietic necrosis disease</b>	1	A	139
<b>Infectious haematopoietic necrosis</b>	1	A+B	586
<b>Infection with infectious salmon anaemia virus</b>	2	B	194
<b>Infection with salmonid alphavirus</b>	1	B	170
<b>Spring viraemia of carp</b>	1	A	105
<b>Viral haemorrhagic septicaemia</b>	1	A+B	586

<sup>1</sup> 1: Kidney, spleen and heart (and in some cases brain).

<sup>2</sup> 2: Same tissues as in sample type 1 + gills.

<sup>3</sup> A: Cultivation in cell culture followed by observation of cytopathic effect.

B: PCR test.

<sup>3</sup> Each sample tested is a pooled sample of up to ten fish per sample.





## The last outbreak of viral haemorrhagic septicaemia (VHS) in Denmark was confirmed in January 2009.

### Koi herpesvirus disease

Koi herpesvirus disease (KHV) has never been reported in Danish carp farms, but has occasionally been detected in imported ornamental koi carp and in garden ponds with koi carp.

In 2019, KHV was detected in three private garden ponds and at three importers of koi carps.

### Spring viraemia of carp

The last occurrence of spring viraemia of carp (SVC) in Denmark was in 2003. Denmark (whole territory) is approved free from SVC by the European Union (Commission Decision 2010/221/EU). SVC has never been reported in any Danish carp farms, but has occasionally been detected in imported ornamental carp with no access to natural waters.

### Viral haemorrhagic septicaemia

The last outbreak of viral haemorrhagic septicaemia (VHS) in Denmark was confirmed in January 2009, and the whole continental territory of Denmark was approved as VHS-free by the European Union in 2013 (Commission Implementing Decision 2013/706/EU). The Danish programme for the eradication of VHS began in 2009 and ended in November 2013. The programme was approved by the European Commission and was co-financed by

the European Fisheries Fund. All freshwater trout farms are approved free from VHS (category I).

Information pertaining to the OIE-listed fish diseases is given in Table 22.

Information pertaining to the OIE-listed fish diseases is given in Table 23.

**Table 22**

Occurrence of OIE-listed fish diseases in Denmark

<b>Epizootic haematopoietic necrosis disease</b>	Never reported
<b>Infection with <i>Aphanomyces invadans</i> (epizootic ulcerative syndrome)</b>	Never reported
<b>Infection with <i>Gyrodactylus salaris</i><sup>1</sup></b>	Suspected, but not confirmed
<b>Infection with HPR-deleted infectious salmon anaemia virus</b>	Never reported
<b>Infection with HPRO infectious salmon anaemia virus</b>	Confirmed infection <sup>2</sup>
<b>Infection with salmonid alphavirus</b>	Never reported
<b>Infectious haematopoietic necrosis</b>	Never reported
<b>Koi herpesvirus disease</b>	Disease present <sup>3</sup>
<b>Red sea bream iridoviral disease<sup>1</sup></b>	Never reported
<b>Spring viraemia of carp</b>	2003
<b>Viral haemorrhagic septicaemia</b>	2009

<sup>1</sup> The disease is not notifiable in Denmark.

<sup>2</sup> Infectious salmon anaemia virus of the genotype HPRO was detected in a wild Atlantic salmon (*Salmo salar*) in a facility for restoration of wild salmon. The salmon was caught in the river of Gudenåen.

<sup>3</sup> The infection was detected in three private garden ponds and at three importers of koi carps.

## Box 12

# National disease control plan for infectious pancreatic necrosis virus and bacterial kidney disease in freshwater fish farms

Infectious pancreatic necrosis virus (IPNV) and bacterial kidney disease (BKD) are present in Denmark. Ongoing surveillance is conducted for IPNV and BKD, and breeding and production farms can be registered as IPNV-free and BKD-free by the DVFA. In 2019, 26 freshwater fish farms were registered as being IPNV-free and 20 freshwater fish farms as being BKD-free (Executive Order No. 967 of 18 July 2013 on the surveillance and registration of IPN and BKD).

Targeted surveillance is conducted at aquaculture production businesses (APBs) registered as free from IPN and/or BKD. Those APBs are inspected and sampled twice a year if the fish are reared at broodstock farms and once a year if they are reared at production farms. A sample of 30 fish is collected for virological examination for IPNV, and another sample of 30 fish for bacteriological examination for BKD.

# 26

In 2019, 26 freshwater fish farms were registered as being IPNV-free and 20 freshwater fish farms as being BKD-free.





# 2.9 Mollusc diseases

Denmark has intensive fisheries of natural mussel stocks (*Mytilus edulis*). Natural stocks of European flat oyster (*Ostrea edulis*) only exist in the Limfjord. The Danish oyster production is mainly based on the utilisation of natural stock. During the past more than 15 years, a number of marine aquaculture facilities producing mussels on ropes in a water column have been established in Denmark. At the moment, the annual production totals approximately 5,000 tonnes of mussels.

## Infection with *Bonamia ostreae*

In January 2020, *B. ostreae* was detected in samples collected in the Limfjord in December 2019. It has been decided to discontinue the surveillance in the Limfjord as it is unlikely that the area will regain the disease-free status once its population has become infected.

## Infection with *Marteilia refringens*

Although infections with *M. refringens* have never been detected in Denmark, it has been decided to discontinue the surveillance for *M. refringens*. This decision was based on a cost-effectiveness analysis. All areas in Denmark have therefore shifted disease categories from being 'disease-free' to 'undetermined' as set out in EU legislation.

Information pertaining to the OIE-listed mollusc diseases is given in Table 23.

**Table 23**  
Occurrence of OIE-listed mollusc diseases in Denmark

<b>Infection with abalone herpesvirus<sup>1,2</sup></b>	Never reported
<b>Infection with <i>Bonamia exitiosa</i><sup>2</sup></b>	Never reported
<b>Infection with <i>Bonamia ostreae</i></b>	Disease present
<b>Infection with <i>Marteilia refringens</i></b>	Never reported
<b>Infection with <i>Perkinsus marinus</i></b>	Never reported
<b>Infection with <i>Perkinsus olseni</i></b>	Never reported
<b>Infection with <i>Xenohaliotis californiensis</i><sup>1,2</sup></b>	Never reported

<sup>1</sup> The disease is not notifiable in Denmark.

<sup>2</sup> Host is not present in Denmark.

# 3. Animal by-products

**Animal by-products (ABPs) are products of animal origin not intended for human consumption.**

**The ABPs emerge from slaughterhouses, plants producing food for human consumption and dairies and as fallen stock from farms.**

**ABPs must be categorised, collected, transported, processed, used, stored and disposed of according to EU legislation.<sup>7</sup>**

ABPs are divided into three categories depending on the risks associated with each type of product:

- Category 1 includes animals suspected of being infected with TSEs and specified risk material (SRM) from cattle or small ruminants, experimental animals, pet animals, zoo animals and circus animals.
- Category 2 includes manure and by-products presenting a risk of being infected with contagious animal diseases.

- Category 3 includes parts of animals slaughtered for human consumption, raw milk, fish, former foodstuffs of animal origin, blood, hides and skins, hooves, feathers, wool, horns, hair and fur.

Table 24 shows a breakdown of the ABPs produced in Denmark in 2019.



Table 24 shows a breakdown of the ABPs produced in Denmark in 2019.

<sup>7</sup> Regulation (EC) No 1069/2009 of the European Parliament and of the Council of 21 October 2009 laying down health rules as regards animal by-products and derived products not intended for human consumption and repealing Regulation (EC) No 1774/2002 (Animal By-products Regulation), and Commission Regulation (EU) No 142/2011 of 25 February 2011 implementing Regulation (EC) No 1069/2009 of the European Parliament and of the Council laying down health rules as regards animal by-products and derived products not intended for human consumption and implementing Council Directive 97/78/EC as regards certain samples and items exempt from veterinary checks at the border under that Directive.



**Table 24**  
Animal by-products produced in Denmark in 2019

<b>Source</b>	<b>Category 1 (tonnes)</b>	<b>Category 2 (tonnes)</b>	<b>Category 3 (tonnes)</b>
<b>Slaughterhouses/cutting plants</b>	34,467	101,821	358,207
<b>Fallen stock</b>	16,977	109,863	None

Source: The Danish Agriculture & Food Council, 2020.

# 4. Livestock statistics

**Table 25**

Livestock population. Establishments and animals in Denmark, 2016-2018

		2017	2018	2019
<b>Cattle</b>	<b>Animals</b>	1,557,453	1,560,757	1,505,474
	<b>Establishments</b>	17,428	16,452	16,101
<b>Sheep</b>	<b>Animals</b>	147,347	149,532	143,080
	<b>Establishments</b>	6,537	6,404	6,211
<b>Goats</b>	<b>Animals</b>	19,536	19,370	19,744
	<b>Establishments</b>	3,004	2,961	2,980
<b>Horses</b>	<b>Animals</b>	174,500 <sup>1</sup>	175,000 <sup>1</sup>	175,000 <sup>1</sup>
	<b>Establishments</b>	No data	78,000 <sup>2</sup>	78,000 <sup>2</sup>
<b>Farmed deer</b>	<b>Animals</b>	14,490	14,131	14,202
	<b>Establishments</b>	486	479	465
<b>Pigs</b>	<b>Animals</b>	13,440,375	13,840,542	13,351,997
	<b>Establishments</b>	8,526	7,967	7,400
<b>Poultry</b>	<b>Animals</b>	32,836,800	32,604,504	29,651,173
	<b>Establishments</b>	1,268	1,266	1,242

Source: Central Husbandry Register, with the exception of horses.

<sup>1</sup> Estimate based on registrations in the national horse database.

<sup>2</sup> Statistics Denmark.







**Table 26**

Animals imported from the EU and third countries to Denmark 2017-2019

	2017	2018	2019
<b>Horses<sup>1</sup></b>	3,224	3,064	3,221
<b>Cattle<sup>2</sup></b>	168	181	117
<b>Pigs<sup>3</sup></b>	3	6	2
<b>Sheep/goats</b>	3,362 <sup>5</sup>	813	51
<b>Poultry<sup>4</sup></b>	5,793,280 <sup>6</sup>	6,021,736 <sup>6</sup>	7,512,626 <sup>6</sup>

Source: Based on the Trade Control and Expert System of the European Commission (TRACES).

<sup>1</sup> Horses, asses, mules and hinnies.<sup>2</sup> Bovine animals.<sup>3</sup> Pigs include domestic pigs (*Sus scrofa domesticus*), Central European boar (*Sus scrofa scrofa*) and warthogs (*Phacochoerus* spp.).<sup>4</sup> Fowls of the species *Gallus gallus domesticus*, ducks, geese, turkeys and guinea fowls.<sup>5</sup> Imports of sheep intended for slaughter.<sup>6</sup> Imports of mainly day-old chicks.**Table 27**

Animals exported from Denmark to the EU and third countries, 2017-2019

	2017	2018	2019
<b>Horses<sup>1</sup></b>	716	648	504
<b>Cattle<sup>2</sup></b>	62,929	70,790	91,759
<b>Pigs</b>	14,673,815	14,968,784	15,337,132
<b>Sheep/goats</b>	1,075	1,156	1,642
<b>Poultry<sup>3</sup></b>	56,116,342	54,076,715	62,504,659

Source: Based partly on the Trade Control and Expert System of the European Commission (TRACES).

<sup>1</sup> Horses, asses, mules and hinnies.<sup>2</sup> Bovine animals.<sup>3</sup> Fowls of the species *Gallus gallus domesticus*, ducks, geese, turkeys and guinea fowls.

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# 6. Animal health contacts in Denmark

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