Ministry of Food, Agriculture and Fisheries of Denmark
Danish Veterinary and Food Administration

Animal Health in Denmark 2023

October 2024

1st edition, 1st impression, September 2024
ISBN: 978-87-93147-63-8.

Design by: Essensen.com
Photos by: Danish Veterinary and Food Administration,
Colourbox and Unsplash

Contents

Preface

It is a pleasure for me to present the 2023 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 transmissible animal diseases into Danish livestock.

The report also reviews developments in 2023 in the field of animal health in Denmark. The focus is on WOAH-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.

I hope that you will find the information in this Annual Report useful; however, please visit our website at **www.fvst.dk** if you need further details. If you cannot find the information you are looking for, please do not hesitate to contact DVFA.

Mette Kirkeskov Sie
Deputy Chief Veterinary Officer
Head of the Animal Health Division

1. Animal health surveillance and contingency planning

Surveillance and control of animal diseases

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

Denmark has a long history of intensive production of food of animal origin and trade in animals and animal products. Relative to the size of the country and compared to other countries, the level of animal production in Denmark is very high. Information on livestock statistics is given in Chapter 4.

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

Such animal disease control programmes are intended to prevent human and animal infections. These programmes are also aimed at protecting trade interests and are governed by legislation. The extensive trade in Danish animals and animal products is highly dependent on the health status of the Danish livestock population. To keep livestock free from diseases, various initiatives are taken to limit the risk of disease introduction into Denmark. The 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 (WOAH) and meets all transparency obligations in any animal disease situation, including the obligation to notify the WOAH of any occurrence of a listed animal disease. Furthermore, as a member of the EU, Denmark has implemented the harmonised EU legislation on animal health and animal production.

The DVFA is constantly focused on national disease awareness, preparedness and control based on experiences, new EU legislation, changes in farming practices, disease risk assessments, developments in the scientific field, etc. Additionally, operational capabilities are continuously improved to provide

Disease surveillance and control programmes are essential to improve animal health and animal welfare.

a prompt and effective response to every single suspected case or outbreak of a notifiable infectious disease in the Danish livestock population.

The main purposes of maintaining disease awareness and preparedness are:

- To reduce the probability that new transmissible animal diseases will be introduced into Denmark.
- To curb the spread of disease among susceptible animal populations.

This is achieved by maintaining a constant focus on the improvement of biosecurity measures, effective disease surveillance and early detection of diseases and by updating contingency plans for appropriate and effective control of disease outbreaks.

A list of suspected and confirmed cases of notifiable animal diseases will in real time be announced on the official website of the DVFA.

Animal disease preparedness

Obligation to report suspected cases of animal diseases

Regulation (EU) 2016/429 of the European Parliament and of the Council on transmissible diseases (the EU Animal Health Law) and the Danish Animal Health Act (Animal Health Consolidation) Act No. 62 of 19 January 2024 provide the legal basis for the obligation to report suspected and confirmed cases of notifiable animal diseases to the competent authority and to maintain a list of notifiable animal diseases in Denmark. Furthermore, the EU Animal Health Law and the Danish Animal Health Act provide legal powers for tasks such as diagnostic and epidemiological investigations, the imposition of movement restrictions on animals and products, the establishment of restriction zones, control on movements within such zones of animals and products, sampling, the culling of infected, suspected and contact animals, the payment of compensation to animal owners, the disposal of carcasses and potentially infectious materials, cleaning and disinfection and, if necessary, preventive or emergency vaccination.

Notifiable animal diseases according to the EU Animal Health Law and animal diseases of interest to Danish society are listed in Executive Order No. 1341 of 27 November 2023.

The Executive Order provides two lists: List 1 comprises animal diseases which must be reported to the DVFA immediately upon suspicion, and List 2 comprises animal diseases which must be reported to the DVFA at the time of confirmation. A description of all notifiable animal diseases in Denmark is available at **www.fvst.dk** (in Danish).

Effective surveillance for clinical signs of transmissible animal diseases is required for early detection of disease outbreaks. According to the Danish Animal Health Act, operators are obliged to call a veterinarian in case they suspect a notifiable disease or in case of abnormal mortalities or other signs of a severe disease among their animals. The veterinarian must immediately notify the relevant Veterinary Inspection Unit of the DVFA of the suspicion if the veterinarian has reason to suspect the presence of a notifiable disease included in List 1. In case of suspicion of a category A or B disease according to the EU Animal health Law, a veterinary officer from the Veterinary Inspection Unit will inspect the animals as soon as possible. In the specific situation of suspicion, the assessment of what constitutes 'as soon as possible' should be clarified between the Veterinary Inspection Unit and the Animal Health Division of the DVFA. If the veterinary officer cannot rule out the suspicion, official restrictions are imposed on the establishment, and samples are collected and dispatched to the national reference laboratory. Category A diseases are diseases that are unusual in the EU and for which immediate eradication measures must be taken. Category B diseases are diseases which must be controlled in all Member States with the goal of eradicating them throughout the EU.

Ante-mortem inspection and post-mortem examination at slaughterhouses are also important elements of the surveillance system.

The role of private veterinarians in animal health surveillance in Denmark is described in Box 1.

Transparency in dealing with suspected or confirmed cases of notifiable animal diseases

A list of suspected and confirmed cases of notifiable animal diseases will in real time be announced on the official website of the DVFA, which displays information (in Danish) on each individual suspected and confirmed case reported. This contributes to increasing the awareness among operators and veterinarians of the potential risk of infection with the relevant notifiable diseases.

Additionally, targeted information on confirmed cases will be sent to the embassies of Denmark's main export markets.

Compensation for losses caused by outbreaks of notifiable animal diseases

The DVFA will compensate operators of establishments where animals have become infected by certain notifiable diseases if the operators suffer a financial loss due to the disease outbreak. Compensation is paid under the provisions of Executive Order No. 694 of 30 May 2023 on Compensation and Expenditure for the Control and Prevention of Domestic Animal Diseases, etc. (in Danish).

In case of a confirmed outbreak of a notifiable disease, the DVFA offers compensation corresponding to the value of animals, eggs and contaminated feed. The compensation is based on scale values or is estimated by a valuation committee. The valuation committee has three members: one appointed by the herd owner, one appointed by the DVFA and one being an employee of the DVFA. The costs of cleaning and disinfecting an infected establishment is paid by the DVFA. Furthermore, the DVFA reimburses income losses following the culling of all animals susceptible to the disease at the establishment. Compensation based on scale values covers 20% of the total income loss due to delay in restocking. If the valuation of animals is made by a valuation committee, any partial income loss is compensated at 8% of the value of the animals.

20 %

Compensation based on scale values covers 20% of the total income loss due to delay in restocking.

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 operators. 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 operators with large herds with cattle, pigs or mink to sign a VASC. Small establishments with few cattle, pigs, sheep, goats or fish may be registered for advisory services on a voluntary basis.

A central element of a VASC is frequent veterinary advisory visits, creating a one-on-one relationship between the operator and the veterinarian. Further, a VASC provides the operator 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.

Having signed a VASC, the operator usually consults the same veterinarian every time. The herd veterinarian may let another veterinarian visit the establishment if necessary or if a second opinion is required.

This gives the herd 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, since they are obliged to inspect the establishment and the animals in question and to assess whether further action should be taken if an operator contacts them with a suspicion of a notifiable animal disease. Depending on the disease suspected, the private veterinarian must then contact the relevant Veterinary Inspection Unit of the DVFA, after which a veterinary officer from the Veterinary Inspection Unit will inspect the animals and, if relevant, take further action. All suspected cases of a notifiable disease will immediately be registered in a database, and the disease status of the herd is updated in the central husbandry register. Depending on the nature of the suspected disease, the international animal health organisations and other member states will be notified as well. A national database and a web interface have been set up to increase the awareness among operators and veterinarians of the potential presence of certain notifiable diseases.

A veterinary advisory service contract is a means to ensuring that the operator is advised by the veterinarian of ways to increase biosecurity that can contribute to the general health of the herd, while the veterinarian also acts as a first-line defence in the surveillance for notifiable animal diseases.

BOX 2

Danish strategy to reduce antimicrobial resistance

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, close connections between animals, food, people and the environment therefore necessitate 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 was developed in close collaboration between authorities, the industry and scientists, and stakeholders continuously discuss interventions to ensure a high level of compliance and maximum effect.

28.9%

Denmark has achieved a 28.9% reduction in the total use of antimicrobials in pigs from 2009 to 2023 through the Yellow Card Initiative, which commenced in 2010.

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 (86%) 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 operator is thereby ordered to make an action plan to reduce the use of antimicrobials to less than the threshold.

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 a 28.9% reduction in the total use of antimicrobials in pigs from 2009 to 2023 through the Yellow Card Initiative, which commenced in 2010. Moreover, the use of critically important antimicrobials such as third-generation and fourth-generation cephalosporins, fluoroquinolones and colistin 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. An advisory Committee on Veterinary Medicines was established in 2018 to provide evidence-based advice to 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. This national target was later extended to include 2023. This goal proved to be too ambitious and had not been met by the end of 2023.

The advisory Committee on Veterinary Medicines will therefore give the Danish Veterinary and Food Administration input for new initiatives to further reduce the use of antimicrobials in pigs.

A description of all notifiable animal diseases in Denmark is available at www.fvst.dk

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 a disease. The surveillance method used depends on the disease and the purpose of the programme, and usually a combination of different surveillance methods is applied. Examples of Danish surveillance programmes are given below.

The Danish Veterinary and Food Administration (DVFA) has particular focus on infectious diseases with high economic and biological consequences. The diseases in focus have an epidemic potential that raises the risk of their introduction into Denmark in the near future. The DVFA has implemented systematic rapid risk assessment to qualitatively assess the risk of disease introduction in case of disease outbreaks in other EU Member States or certain third countries. For more information on this rapid risk assessment of disease introduction, see Box 3.

Examples of Danish surveillance programmes for emerging diseases:

- Pig carcass samples submitted by operators to a diagnostic laboratory undergo a general post-mortem examination, and selected samples are examined for African swine fever and classical swine fever. For more information on the supplementary surveillance for African swine fever and classical swine fever, see Box 9 in section 2.4.
- In 2014, the DVFA initiated a special surveillance programme for porcine epidemic diarrhoea. In 2015, the Danish pig industry took over responsibility for the surveillance programme. For more information on the absence of porcine epidemic diarrhoea virus in Denmark, see section 2.4.
- 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 7 in section 2.1.
- Operators of establishments with cattle, sheep and goats are offered laboratory examination of material from abortions in the form of a post-mortem examination for brucellosis and subsequently microbiological and histological examinations. For more information, see Box 8 in section 2.2.

The Danish Veterinary and Food Administration (DVFA) focuses on contingency planning

The DVFA has strategically prioritized contingency planning to enhance resilience in anticipation of future crises. In support of this strategic imperative, a comprehensive policy on contingency planning was instituted in 2023, encompassing all facets of the DVFA's operational purview. This policy serves to establish a cohesive framework for contingency planning, thereby harmonising efforts across the DVFA's critical sectoral responsibilities.

Drawing upon the basic principles of and official regulations from the Danish Emergency Management Agency, the policy has introduced a standardised system for the development of unified contingency plans that is aimed at streamlining planning processes across divisions. Supported by partial plans, the master plan sets out the basic structure for contingency planning and crisis management. In 2024, partial plans on distinct domains such as IT infrastructure, nuclear safety, food safety and animal health will undergo a comprehensive review, and revisions to the plans will be implemented.

To operationalise the above framework, a dedicated Crisis Management Team was established in 2023 under the auspices of the Executive Office. Tasked with spearheading preparedness initiatives, the

A Veterinary Crisis Team was established in October 2023. The Crisis Team is responsible for the veterinary risk and preparedness analysis.

BOX 3
Qualitative rapid risk assessment to determine the probability of an introduction of new diseases into Denmark

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, including through transport vehicles, it is necessary to assess on a regular basis the risk of introduction of new transmissible animal diseases into Denmark.

The DVFA has implemented a structured, systematic, transparent and well-documented qualitative rapid risk assessment. The risk assessment reports are used to provide scientific information to decision makers to prevent the introduction of animal diseases into Denmark in case of outbreaks of certain animal diseases in other EU Member States or countries neighbouring the EU. Rapid risk assessments are prepared in accordance with the guidelines given in the WOAH Handbook on Import Risk Analysis for Animals and Animal Products, in particular the risk assessment steps.

Hazard identification is the first step and is considered separately from the risk assessment process. The risk assessment process itself is subdivided into four steps:

1. Entry assessment,
2. Exposure assessment,
3. Consequence assessment and
4. Risk estimation.

For rapid risk assessments, only an entry assessment and an exposure assessment are made to estimate the probability of an introduction of a particular animal disease into the Danish susceptible population because the estimated consequences of the particular disease were assessed to be high, either economically or biologically.

Rapid risk assessment reports are written to describe and report the estimated probability of introduction of animal diseases into Danish susceptible animal populations. They are intended to help risk managers prepare for possible health risks and to reduce the social and economic consequences of the relevant threats (the pathogen causing the diseases).

In short, the aim of a rapid risk assessment is to make a well-documented report describing:

- The importance and purpose of the disease risk assessment.
- The current status of the relevant disease in the EU or neighbouring countries.
- The estimated probability of introduction of the relevant animal disease into Denmark through different risk pathways already identified.
- The significance of the consequences if the animal disease gains a stronghold in Denmark and spreads from the first infected population to other sensitive animal populations.

Results from the rapid risk assessments are then used by the risk managers to determine risk-mitigating actions, such as the requirement of a more thorough inspection of vehicles used for international animal transportation, additional tests of recently imported live animals and, depending on the estimated probability of introduction, the need to provide 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** (in Danish with a summary in English) within three working days, from the time when the official outbreak notification is received.

In 2023, specific rapid risk assessment reports were made and published for highly pathogenic avian influenza, West Nile fever virus, sheep pox, bluetongue, rabies and African swine fever due to outbreaks in the EU and countries neighbouring the EU.

team has been given the responsibility for facilitating crisis management, performing contingency planning, delivering training programmes on crisis management to employees at all levels, coordinating crisis preparedness exercises and delivering support to all divisions throughout the organisation.

In addition, a dedicated Veterinary Crisis Team was established in October 2023. The Crisis Team is a part of the Animal Health Division and is responsible for the veterinary risk and preparedness analysis and for developing and maintaining veterinary contingency plans, partial plans and action cards. Furthermore, the Veterinary Crisis Team oversees the handling of veterinary incidents such as outbreaks of highly pathogenic avian influenza (HPAI) and other notifiable diseases.

Veterinary diagnostic laboratories in Denmark

The Danish veterinary diagnostic laboratories fall into three different categories: national reference laboratories (NRLs), official laboratories (OLs) and approved veterinary diagnostic laboratories (ALs). All Danish NRLs, OLs and ALs have obtained accreditation according to the DS/EN ISO/IEC 17025 standard, at least of the methods used to analyse samples for notifiable disease agents.

National reference laboratories

As required by Article 100 of Regulation (EU) 2017/625 of the European parliament and of the Council on official controls, the DVFA has designated national reference laboratories (NRLs) for the diseases listed in the Animal Health Law. Statens Serum Institut (SSI) is designated as the NRL for diseases in terrestrial animals and the National Institute of Aquatic Resources at the Technical University of Denmark (DTU Aqua), as the NRL for diseases in aquatic animals.

Official laboratories

In accordance with Article 37 of Regulation (EU) 2017/625 of the European Parliament and of the Council, the DVFA has also designated veterinary diagnostic laboratories as OLs. The lists of NRLs and OLs are continuously updated and can be found on the DVFA website **(https://foedevarestyrelsen.dk/dyr/kontrol/laboratorieanalyser-)**.

Approved veterinary diagnostic laboratories

Approved veterinary diagnostic laboratories (ALs) are laboratories approved by the DVFA under national legislation. Currently, five privately owned veterinary laboratories are ALs in Denmark.

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

As an NRL, the SSI collaborates closely with the OLs and the ALs. The collaboration includes the handling of samples from suspected cases of notifiable diseases in terrestrial animals, information sharing and standby availability in case a laboratory identifies problems with a particular analysis. Most OLs and ALs perform diagnostic analyses in close collaboration with the agricultural industry.

Disease control

Contingency plans

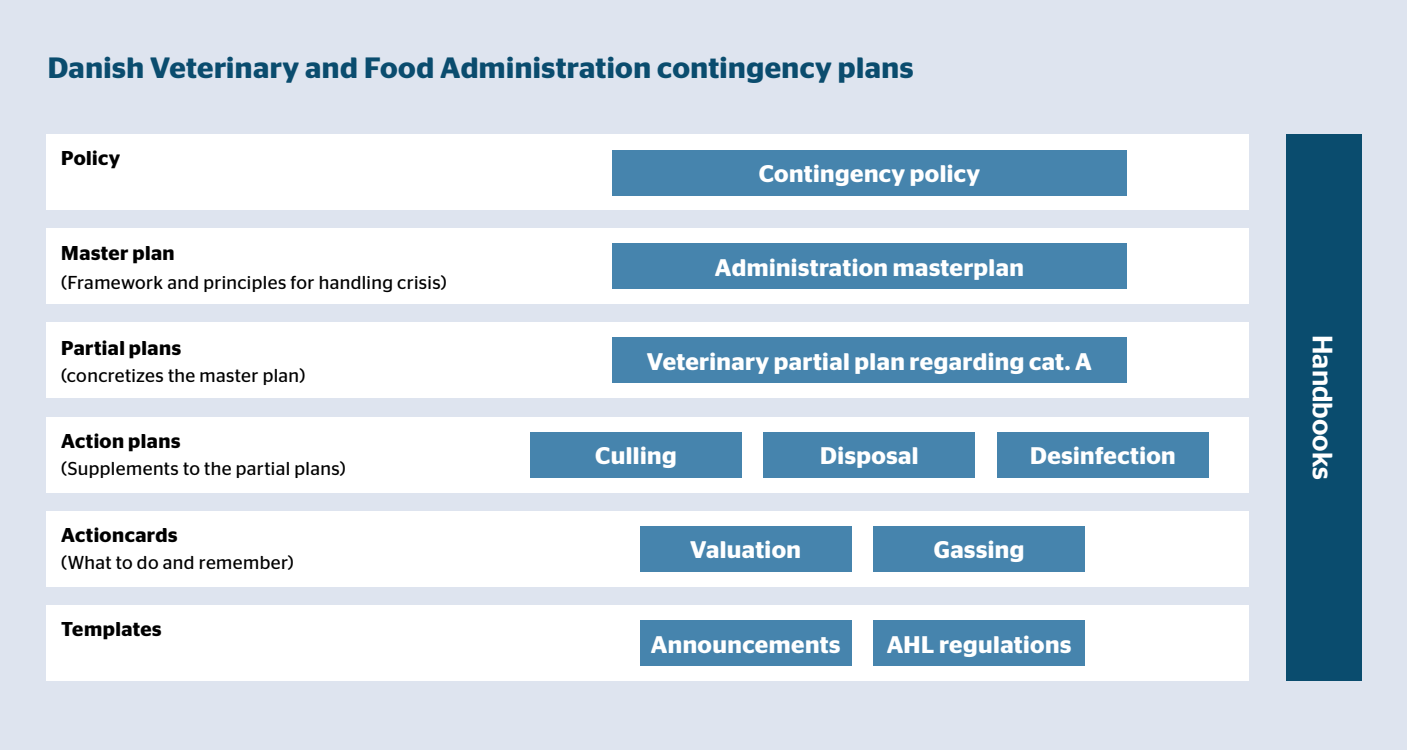
Being prepared is an important precautionary principle to enable a rapid and effective response to any outbreak of a notifiable disease. Due to resent developments in the food and veterinary crises in Europe, the DVFA has increased its focus on contingency planning throughout the organisation.

In consequence, a contingency policy and a general contingency plan have been developed for the entire organisation. The DVFA is currently in the process of updating and developing new contingency plans for animal diseases defined as category A diseases under the EU Animal Health Law. Category A diseases are diseases that normally do not occur in the EU and for which immediate eradication measures must be taken. The Danish contingency plan for category A diseases consists of an overall plan (the 'partial plan' in Figure 1) and action plans on the culling and disposal of animals, cleaning and disinfection of infected establishments, etc., supplemented by disease-specific actioncards and templates with standard text.

The DVFA is planning to develop a partial plan for category B and C diseases as well. Further partial plans are also in the pipeline, but have not been defined yet. Each partial plan comprises associated action plans and actioncards.

The hierarchy of the Danish contingency plan for category A diseases is as follows:

Figure 1. Example of the development of contingency plans. More partial plans, action plans, action cards, etc., will be added.



It is an ongoing task to prepare and update veterinary partial plans for category A diseases. Those plans deal with all category A diseases as there are many similarities between the strategic, operational and tactical tasks of preventing and reducing the transmission of infectious diseases. The plans are based on the provisions on contingency plans of the EU Animal Health Law and are expected to be ready in the third quarter of 2024.

Action plans specify, for example, culling methods for different species and methods for handling the disposal of culled animals and animal by-products. Other examples are general procedures for cleaning and disinfection.

Actioncards describe specific detailed actions during an outbreak of a disease. One example is how to call a gas company requesting the delivery of gas for culling. That action card will state the number of the contact person with the gas company and what information to give to the gas company.

Template letters are, for example, standard letters to be used for notifying an operator of the official restrictions imposed on the establishment following the outbreak of a category A disease.

Vaccination policy

The main methods for disease control of category A diseases as described in the Danish contingency plans are the quarantining of establishments in which the presence of a notifiable disease in animals is suspected, the culling of infected animals, the cleaning and disinfection of the establishment and the establishment of restriction zones.

In general, preventive vaccination against notifiable diseases is banned, except for Newcastle disease. However, EU legislation has provisions permitting the use of emergency vaccination to control outbreaks following an epidemiological analysis of the disease situation.

Disease control and eradication – 'the Danish model'

Denmark has a long tradition of eradicating animal diseases. As a prominent example, Denmark eradicated tuberculosis and brucellosis from domestic livestock by the mid-1900s. The eradication was achieved through close collaboration between the veterinary research laboratory, the veterinary administration authority and the industry, which commenced in the late 1800s. In those days, operators created both dairy and slaughterhouse

Denmark has a long tradition of eradicating animal diseases. As a prominent example, Denmark eradicated tuberculosis and brucellosis from domestic livestock by the mid-1900s.

All contingency plans are publicly available at www.fvst.dk

cooperatives, which were owned by the operators (farmers).

All operators 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 always gained broad support from all operators, and effective eradication measures have subsequently been supported by legislation.

Several animal diseases besides tuberculosis and brucellosis have been eradicated in Denmark because of the efficient 'Danish model', including enzootic bovine leukosis, Aujeszky's disease, infectious bovine rhinotracheitis, bluetongue, viral haemorrhagic septicaemia and bovine virus diarrhoea.

The disease control organisation

The emergency preparedness and response of the competent authorities to an outbreak of a notifiable animal disease is facilitated by the legal powers of the competent authorities, the 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 and the establishment of a Local Disease Control Centre.

In the event of an outbreak, the National Disease Control Centre is staffed by employees from the Danish Veterinary and Food Administration (DVFA) central office, and the Local Disease Control Centre by employees from the relevant Veterinary Inspection Unit(s). The DVFA has three Veterinary Inspection Units with local veterinary officers specifically trained in managing suspected cases and outbreaks of notifiable animal diseases.

Training

Practical training is organised and prepared as part of the contingency plans through a cooperation between the dedicated crisis management team, the veterinary crisis management team and veterinarians from the DVFA, including veterinarians from the Veterinary Inspection Units.

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

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 prepare the most beneficial exercise programme for the following years.

The DVFA has three Veterinary Inspection Units with local veterinary officers specifically trained in managing suspected cases and outbreaks of notifiable animal diseases.

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, also as cross-border exercises at international level under the auspices of the Nordic-Baltic Veterinary Contingency Group.

Simulation exercises are postponed in years with large-scale disease outbreaks.

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

3-5

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

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

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, only products complying with EU law can be exported from Member States to third countries. Where a bilateral agreement has been concluded between the European Union or one of its Member States and a third country, it follows from the Regulation that products to be exported to that country must comply with all provisions of the bilateral agreement.

Regulation (EU) 2017/625 of the European Parliament and of the Council 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 issuance of certificates for products of animal origin is based on Commission Implementing Regulation (EU) 2020/2235 and national legislation (Executive Order No. 729 of 29 May 2020 on the issuance of certificates for live animals, food, feedingstuffs, animal by-products and derived products, germinal products and materials intended to come into contact with food). Furthermore, the certifying officer must be impartial and independent from commercial interests. According to the rules, the certifying officer must base his/her certification on facts obtained from official regular on-site control visits and results of previous audits of the monitoring programmes as well as epidemiological surveillance programmes. The certifying officer cannot certify data of which he/she has no personal knowledge or which cannot be ascertained. No blank or incomplete certificates can be issued, nor can certificates for products which are no longer available for inspection.

If a notifiable animal disease breaks out, the following steps will be carried out immediately:

- All veterinary health certificates affected by the outbreak will be identified.
- Affected certificates will be blocked fully or partially on the official website of the Danish Veterinary and Food Administration (DVFA).
- Export restrictions imposed as a result of the outbreak will be published on the official website of the DVFA.
- Information on the outbreak and blocked/partially blocked certificates will be circulated to all certifying officers.
- Information on the outbreak will be circulated to the European Commission and the Danish Embassies.
- Affected certificates already issued will be reviewed, and it will be decided whether any of the certificates must be cancelled or whether any consignments already shipped must be recalled.

2. Livestock disease status

In 2023, Denmark and the rest of Europe experienced high prevalence of highly pathogenic avian influenza (HPAI) in poultry and other captive birds. In addition to HPAI outbreaks, a small number of outbreaks of other notifiable animal diseases were recorded. Several WOAH-listed diseases were not present in Danish livestock in 2023, and Denmark is official recognised as free from the following livestock diseases by the WOAH:

- Foot and mouth disease without vaccination
- Classical swine fever (CSF)
- Peste des petit ruminant
- African horse sickness

Denmark is recognised as officially free from the following diseases by the European Commission:

- Aujeszky's disease
- Bluetongue
- *Brucella abortus, B. melitensis* and *B. suis* in bovine, sheep and goat herds
- Infection with *Mycobacterium tuberculosis* complex in bovine herds
- Infection with classical rabies virus
- Enzootic bovine leukosis
- Infectious bovine rhinotracheitis (IBR)
- Bovine virus diarrhoea (BVD)
- Infectious salmon anaemia (ISA)
- Viral haemorrhagic septicaemia (VHS)

Denmark is also recognised as a country with a negligible risk of bovine spongiform encephalopathy (BSE) by WOAH and *Trichinella* spp. by the European Commission.

An overview of the animal health status in Denmark for WOAH-listed diseases is given in a table in each section for the relevant animal category.

Information on the Danish strategies for the surveillance and control of animal diseases is given in Chapter 1 and on the website of the Danish Veterinary and Food Administration at **www.fvst.dk.**

Several WOAH-listed diseases were not present in Danish livestock in 2023.

2.1 Multiple species diseases

A number of diseases have the potential to infect a wide variety of animals, both domestic animals and wildlife species. Some animal diseases are even infectious to humans. However, Denmark has not experienced any outbreaks of many of the diseases infectious to multiple species for decades. This section offers a detailed description of the status of some of the WOAH-listed diseases that are infectious to multiple species.

Information pertaining to the WOAH-listed multiple species diseases is given in Table 2 on page 16.

Table 1: Blood samples from Danish pigs examined for Aujeszky's disease, 2021 - 2023

Year	Samples
2021	37,600
2022	35,289
2023	30,865

Source: Statens Serum Institut (SSI) and other official laboratories in the EU, 2023

Denmark has been officially free from Aujeszky's disease since 1992.

Aujeszky's disease

The latest case of Aujeszky's disease occurred in Denmark in 1991. Denmark has been officially free from Aujeszky's disease since 1992. The disease-free status of Denmark is set out in Part I of Annex VI to Commission Implementing Regulation (EU) 2021/620.

Under the Danish Aujeszky's disease surveillance programme, blood samples from 2% of all sows with a weight of more than 140 kg are tested at slaughter or before trade.

The current surveillance programme was initiated in 2012. All boars at semen collection centres are regularly tested in accordance with the provisions of Commission Delegated Regulation (EU) 2020/686. Moreover, breeding pigs intended for export to certain countries outside the EU are tested for Aujeszky's disease. The number of blood samples examined for Aujeszky's disease in the period 2021 - 2023 is given in Table 1. Due to trade fluctuations, the number of samples tested often varies from year to year.

Table 2: Latest occurrence of WOAH-listed multiple species diseases in Denmark

Disease	Latest occurrence
Anthrax	1988
Crimean Congo haemorrhagic fever[1]	Never reported
Equine encephalomyelitis (Eastern)	Never reported
Heartwater[1]	Never reported
Infection with Aujeszky's disease virus	1991
Infection with bluetongue virus	2008
Infection with *Brucella abortus*, *Brucella suis*, and *Brucella melitensis*	Cattle: 1962 Pigs: 1999 Sheep and goats: never reported
Infection with *Echinococcus granulosus*	Not reported[2]
Infection with *Echinococcus multilocularis*	2023[3]
Infection with epizootic haemorrhagic disease virus	Never reported
Infection with foot and mouth disease virus	1983
Infection with *Mycobacterium tuberculosis* complex	1994
Infection with rabies virus	1982[4]
Infection with Rift Valley fever virus	Never reported
Infection with rinderpest virus	1782
Infection with *Trichinella* spp.	1930
Japanese encephalitis	Never reported
New World screwworm (*Cochliomyia hominivorax*)[1]	Never reported
Old World screwworm (*Chrysomya bezziana*)[1]	Never reported
Paratuberculosis	Disease present[5]
Q fever	Disease present
Surra	Never reported
Tularemia	2023[6]
West Nile fever	Never reported

[1] The disease is not notifiable in Denmark.
[2] Year of latest outbreak not known.
[3] Detected in wildlife (red fox).
[4] Infection with classical rabies virus in domestic animals.
[5] The disease is not officially controlled in Denmark; however, the cattle industry runs a voluntary control programme.
[6] Detected in wildlife (hare).

Denmark has been officially free from bluetongue since 1 January 2011.

One suspected case of Aujeszky's disease was reported to the Danish Veterinary and Food Administration in 2023. The case was reported due to clinical symptoms. Official movement restrictions were imposed on the establishment under suspicion while confirmatory laboratory testing was conducted at the NRL. The suspected case tested negative for Aujeszky's disease.

Bluetongue

The latest outbreak of bluetongue serotype 8 (BTV-8) in Denmark occurred in November 2008. Denmark has been officially free from bluetongue since 1 January 2011. The disease-free status of Denmark is set out in Part I of Annex VIII to Commission Implementing Regulation (EU) 2021/620.

In 2007 and 2008, Denmark and most Northern and Central European countries experienced outbreaks of bluetongue caused by (BTV-8) in establishments with sheep and cattle.

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 in Denmark since 1 January 2011.

A surveillance programme for bluetongue has been implemented in Denmark according to Commission Delegated Regulation (EU) 2020/689. Serological tests were performed on bulk milk samples collected from 50 different cattle herds in 2023. All tested negative for bluetongue.

The latest case of brucellosis in pigs was in 1999, when *B. suis* biovar 2 was diagnosed in a herd of free-range pigs.

Vector surveillance activities have been carried out in Denmark since the first outbreak of bluetongue. For further details on vector surveillance, see Box 6 on page 21.

The Danish Veterinary and Food Administration (DVFA) was notified of four suspected cases of bluetongue in 2023, all in cattle. Two of the cases were reported due to clinical symptoms. One of those cases was rejected by a Veterinary Inspection Unit of the DVFA based on an evaluation of the clinical symptoms, while the other was rejected due to negative laboratory tests. The last two cases were reported due to positive serological tests. Official restrictions were imposed on the establishments under suspicion while laboratory testing was conducted. The virological tests of the samples proved negative.

Brucellosis

The latest outbreak of brucellosis due to *Brucella abortus* in Denmark occurred in cattle in 1962, and the latest case of brucellosis due to *Brucella suis* biovar 2 occurred in pigs in 1999 in a herd of free-range pigs. *Brucella melitensis* has never been reported in Denmark.

Denmark has been officially free from *B. abortus, B. melitensis* and *B. suis* in bovine establishments since 1979 and in sheep and goat establishments since 1995. The disease-free status of Denmark is set out in Part I of Annex I to Commission Implementing Regulation (EU) 2021/620.

The disease-free status has been attained through the official Danish eradication programme for brucellosis in bovine establishments, which was initiated in 1948. Today, all bulls at semen collection centres are regularly tested in accordance with the provisions of Commission Delegated Regulation (EU) 2020/686. Cattle intended for export to certain countries outside the EU are also tested before export. In 2023, 48 aborted foetuses from cattle underwent laboratory testing for brucellosis. All tested negative (see Box 8 on page 25 for more information on the supplementary surveillance for brucellosis in cattle).

Blood samples from sheep and goats collected through the voluntary lentivirus control programme managed by SEGES Innovation (see section 2.3 on sheep and goat diseases) are also tested under a serological surveillance programme for *B. melitensis*.

In 2023, two suspected cases of brucellosis were reported to the DVFA. One case was reported due to clinical symptoms in cattle. The other case was reported due to positive serological samples from a sheep. Official restrictions were imposed on the establishments under suspicion while laboratory testing was conducted. The samples of the suspected cases tested negative at the national reference laboratory.

The latest case of brucellosis in pigs was in 1999, when *B. suis* biovar 2 was diagnosed in a herd of free-range pigs. The source of the infection was never found, but it was suspected that *B. suis* biovar 2 had been transmitted from European brown hares in the area. *Brucella 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 Commission Delegated Regulation (EU) 2020/686. Breeding pigs intended for export to certain countries outside the EU are also tested for brucellosis before export.

The number of blood samples examined for brucellosis in the period 2021 - 2023 is given in Table 3.

Foot and mouth disease

Denmark is recognised by the WOAH as 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.

In 2023, no suspicions of FMD were reported in Denmark.

Infection with *Mycobacterium tuberculosis* complex

The latest outbreak of *Mycobacterium tuberculosis* complex (MTBC) (*Mycobacterium bovis*, *Mycobacterium tuberculosis* or *Mycobacterium caprae*) in Denmark occurred in farmed deer in 1994 and in cattle in 1988. Danish bovine establishments have been officially free from MTBC since 1980. The disease-free status of Denmark is set out in Part I of Annex II to Commission Implementing Regulation (EU) 2021/620.

In 1988, MTBC was also diagnosed in farmed deer under the surveillance programme for MTBC initiated in 1989, which comprises all Danish herds of farmed deer. The active surveillance programme in farmed deer is no longer in operation, but passive surveillance continues.

The eradication of infections with MTBC 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 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. In 2023, 441,749 slaughter animals were inspected. Furthermore, bulls at semen collection centres are regularly tuberculin-tested in accordance with the provisions of Commission Delegated Regulation (EU) 2020/686.

Cattle intended for export to certain countries outside the EU are also tested before export if required by the third country. In 2023, tests performed at semen collection centres and in connection with the exportation of animals were negative for MTBC.

Rabies

The latest outbreak of classical rabies (RABV) occurred in domestic animals in 1982. In wild animals, the latest occurrence was in 1981. Denmark has been officially free from infection with RABV since 2021. The disease-free status of Denmark is set out in Part I of Annex III to Commission Implementing Regulation (EU) 2021/620.

Rabies is caused by a neurotropic virus of the genus *Lyssavirus* of the family *Rhabdoviridae*. It is transmissible to all mammals. There are several genetic lineages of the genus *Lyssavirus*, including the classical rabies virus and the European bat lyssavirus (EBLV). EBLV is subdivided

Denmark has been officially free from infection with rabies since 2021.

Table 3: Blood samples examined under the Danish brucellosis surveillance programme, 2021 - 2023

Year	Cattle	Pigs[1]	Sheep and goats
2021	2,119	27,151	1,703
2022	582	23,144	2,128
2023	593	19,977	1.592

[1] Due to trade fluctuations, the number of samples tested often varies from year to year.

Source: Statens Serum Institut (SSI), the Technical University of Denmark and other official laboratories in the EU, 2023.

Table 4: Animals examined under the Danish trichinellosis surveillance programme, 2021 - 2023

Year	Pigs (incl. boars and sows)	Farmed wild boars[1]	Horses
2021	18,508,082	569	761
2022	17,119,391	403	487
2023	14,370,762	206	462

[1] Privately hunted wild boars are included.

Source: The Laboratory Division of the Danish Veterinary and Food Administration and other laboratories accredited to test for *Trichinella* spp., 2023.

into two biotypes, EBLV-1 and EBLV-2. Carnivores, especially species of the canidae family, are the principal reservoir host for the classical rabies virus. Bats are the principal reservoir host for EBLV-1 and EBLV-2.

The first case of EBLV was diagnosed in Denmark in 1985 when a woman was bitten by a rabid bat. This incident gave rise to the surveillance for rabies virus in bats in Denmark. In 1985, 18.9% of bats in Southern and Eastern Jutland were rabies-positive. The occurrence of bat rabies has been under surveillance ever since.

Surveillance is performed by testing animals suspected of being infected with rabies (both bats and mammals) and bats showing symptoms of rabies and having been in contact with other animals or humans, and by proactive surveillance for rabies in bats. The latest case of EBLV in Danish domestic animals was diagnosed in sheep in 2002 (EBLV-1), and the latest cases of EBLV in Danish bats were diagnosed in 2009 (EBLV-1) and 2015 (EBLV-2), respectively.

In 2023, 42 bats and two cats suspected of being infected with rabies virus were tested. All tested negative. Moreover, saliva samples from 70 bats were analysed for antibodies under the proactive surveillance programme; all were found to be negative.

Trichinellosis

The latest outbreak of *Trichinella* spp. in domestic animals in Denmark was reported in 1930. Denmark has been classified as a region with a negligible risk of trichinellosis in herds of domestic pigs according to Commission Regulation (EC) No. 2075/2005) since 2007.

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.

The Danish surveillance programme for demonstrating the absence of *Trichinella* spp. infections distinguishes between pigs from holdings applying controlled housing and pigs from holdings that are not officially recognised as applying controlled housing conditions, as defined in Commission Implementing Regulation (EC) 2015/1375. 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 almost 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 competent Danish authorities. All animals of susceptible species slaughtered at Danish slaughterhouses are examined in accordance with the methods prescribed in Commission Implementing Regulation (EC) 2015/1375.

For more than 90 years, targeted tests have been performed in Denmark without discovering any *Trichinella* spp. in pork or horse meat. The number of animals from each category of slaughtered animals examined under the Danish trichinellosis surveillance programme in the period 2021 - 2023 is shown in Table 4.

In 2023, 42 bats and two cats suspected of being infected with rabies virus were tested. All tested negative.

BOX 5
Highly pathogenic avian influenza in mammals

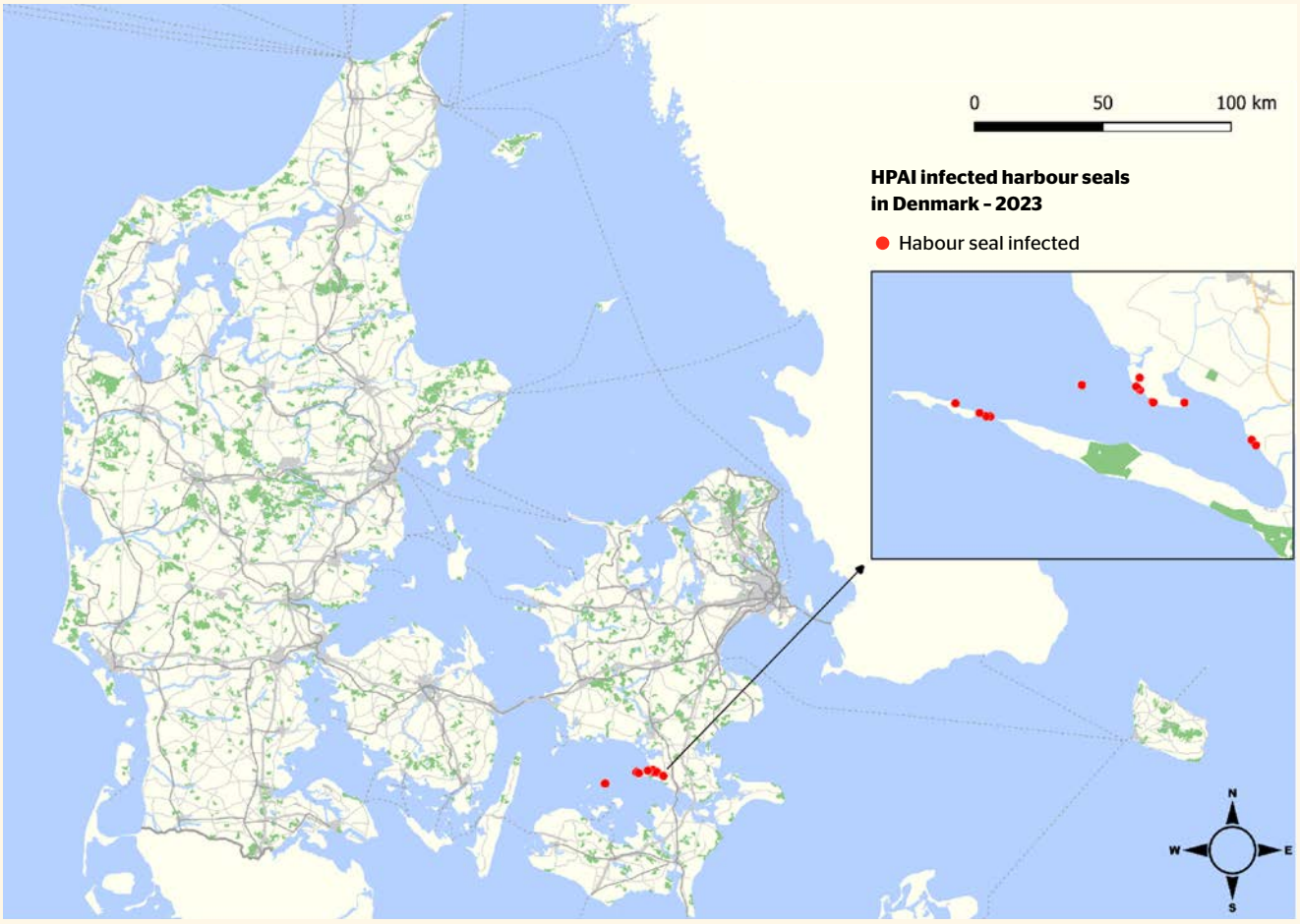
In 2023, Denmark encountered an outbreak of highly pathogenic avian influenza (HPAI) among harbour seals. In late august, reports were made of multiple dead harbour seals in the Avnø Inlet of Southern Zealand. The Avnø Inlet has a colony of harbour seals, comprising approximately 250 animals. The report was made at a time with a high incidence of HPAI infection in seagulls and other seabirds, and since it was the first occurrence of death among harbour seals in that area, carcasses were examined. The post-mortem examinations of the seals were suggestive of HPAI, which was confirmed by genetic analysis to be H5N1.

The outbreak persisted for five weeks. During that period, a total of 23 harbour seals were found dead, 17 of which underwent HPAI testing. All 17 tested positive for HPAI H5N1 (Figure 2).

17

During the outbreak, a total of 17 harbour seals tested positive for HPAI H5N1.

Figure 2: Map of HPAI positive harbour seals in Denmark, 2023



Source: The Veterinary Pathology Group, Department of Veterinary Disease Biology, University of Copenhagen.

BOX 6
Surveillance for disease vectors in Denmark in 2023

Over the years, there has been an 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. Over the following years, the vector surveillance programme was expanded to include mosquitoes and ticks.

Since 2012, the Danish Veterinary and Food Administration and the Technical University of Denmark (in 2019 replaced by the University of Copenhagen) have carried out systematic surveillance of mosquitoes and biting midge abundance during the warm season.

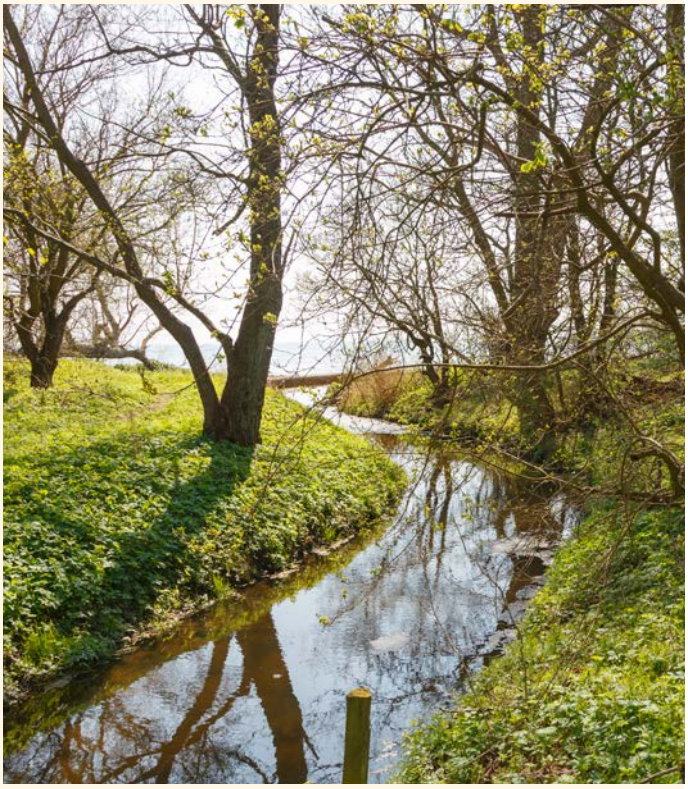
Vectors are collected on a weekly basis through the use of octenol and CO_2-baited suction traps in private gardens and light traps at bovine establishments. National average abundance estimates are updated weekly at **www.myggetal.dk** (in Danish). Additional traps are operated permanently at Copenhagen Airport to monitor potential introductions of exotic mosquito species.

Since June 2017, the surveillance has also included larvae, nymphs and adults of *Ixodes ricinus* ticks at three forest sentinel sites.

The summer of 2023 was characterised by cold weather conditions resulting in a low number of all mosquito species present in Denmark apart from *Culex pipiens* that was abundant in late summer-early autumn. The human-biting West Nile vector *Culex modestus* was nearly absent in 2023. The abundance of *Culicoides* was very low in June and July but relatively abundant in the latter half of August. The abundance of ticks continues to appear stable from year to year, although emerging tick-borne encephalitis continues to spread geographically, especially in northern Zealand. However, sporadic human cases are now seen elsewhere on Zealand.

Culex mosquitoes (384 in total) collected under the surveillance programme all tested negative for West Nile fever virus and Usutu virus.

No exotic vector species were found in Denmark in 2023.



384

Culex mosquitoes (384 in total) collected under the surveillance programme all tested negative for West Nile virus (WNV) and Usutu virus.

BOX 7

Surveillance for West Nile Fever virus in Denmark in 2023

During the past few years, an increasing number of European countries have reported outbreaks of infection with West Nile Fever virus (WNV). In 2023, outbreaks of WNV in horses, people and birds were continuously detected in Southern and Eastern Europe. Outbreaks also continued in countries close to Denmark. As WNV has continued to spread further north with migratory birds from endemic areas, surveillance activities are highly relevant to identify whether the infection has reached Danish territory.

In 2023, the Danish Veterinary and Food Administration, Statens Serum Institut, the Natural History Museum of Denmark and the University of Copenhagen continued the ongoing surveillance for WNV in Denmark.

Several animal populations were tested, and only migratory birds tested WNV-antibody positive. A total of 216 migratory birds were tested for antibodies and less than 1% were WNV-antibody positive. By contrast, 44 native wild birds found dead tested WNV-antibody negative. All the tested dead birds were of species particularly sensitive to WNV.

A total of 79 outdoor laying hens were tested, and all of them tested WNV-antibody negative. Likewise, 45 bats found dead tested WNV-antibody negative. Further, 384 mosquitoes collected under the insect vector surveillance programme (see Box 6) were tested for WNV, and all tested WNV-antibody negative.

Data from the 2023 surveillance programme indicate that it is yet unlikely that infections will become established in the native bird and mosquito populations. However, the continuous movement of outbreaks towards Northern Europe highlights the need for an intensive surveillance of animals as an early warning of public health events.

1%

A total of 216 migratory birds were tested for antibodies and less than 1% were WNV-antibody positive.

2.2 Cattle diseases

Denmark has a cattle population of approximately 1,450,000 animals. In terms of establishments, there are 80% beef and 20% dairy establishments. The trend towards fewer but larger dairy establishments has been evident for many years. In 2023, Denmark had approximately 550,000 lactating cows.

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

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

Information pertaining to the WOAH-listed cattle diseases is given in Table 5 on page 24.

Bovine spongiform encephalopathy

Comprehensive BSE testing has been conducted for more than two decades. The latest case of BSE in Denmark occurred in 2009 in a 14-year-old cow. 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 WOAH 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.
- Ruminant-to-ruminant feed ban, which has been in place in Denmark since 1990.
- The feed ban, which was tightened most recently 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 2.8 million tests performed since the beginning of 2001.
- The long period of more than 25 years since the birth of the youngest Danish case of BSE.

Denmark is recognised by the EU as officially free from enzootic bovine leukosis, infectious bovine rhinotracheitis and bovine virus diarrhoea.

No cases of BSE have been diagnosed in Denmark since 2009. During the period 2000 - 2009, a total of 18 cases of BSE were detected. The youngest Danish animal diagnosed with BSE was a cow born in 1999. No animals born after the implementation of the total feed ban in 2001 have tested positive for BSE. This fact highlights the importance and effectiveness of the total feed ban.

In 2023, no cases suspected due to clinical symptoms of BSE were reported to the Danish Veterinary and Food Administration (DVFA).

No cases of BSE have been diagnosed in Denmark since 2009, when BSE was diagnosed in a 14-year-old cow.

Surveillance for bovine spongiform encephalopathy

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

Table 5: Latest occurrence of WOAH-listed cattle diseases in Denmark

Disease	Latest occurrence
Bovine anaplasmosis	Never reported
Bovine babesiosis[1]	Suspected, but not confirmed
Bovine genital campylobacteriosis	1995
Bovine spongiform ewncephalopathy	2009
Bovine virus diarrhoea	2019
Enzootic bovine leukosis	1990
Infection with lumpy skin disease virus	Never reported
Infection with *Mycoplasma mycoides* subsp. *mycoides* SC (contagious bovine pleuropneumonia)	1886
Infectious bovine rhinotracheitis/infectious pustular vulvovaginitis	2005
Theileriosis[1]	Never reported
Trichomonosis	1990
Trypanosomosis	Never reported
Viral haemorrhagic septicaemia[1]	Never reported

[1] The disease is not notifiable in Denmark.

Table 6: Amendments to the Danish BSE surveillance programme since 2001

BSE testing in Denmark (periods)	Clinically suspected cases tested	Risk animals tested: emergency-slaughtered animals, fallen stock and AM animals[1]	Healthy slaughter animals tested
1 Jul 2001 – 31 Dec 2008	All (no age limit)	All > 24 months	All > 30 months
1 Jan 2009 – 30 Jun 2011		All > 48 months	All > 48 months
1 Jul 2011 – 31 Dec 2012			All > 72 months
1 Jan 2013 – 3 Jul 2013			Random samples > 72 months
4 Jul 2013 –			No testing

[1] Animals with clinical signs at ante-mortem.

Table 7: Results of the Danish BSE surveillance programme, 2021-2023

Category	2021		2022		2023	
	Animals tested	Positive animals	Animals tested	Positive animals	Animals tested	Positive animals
Fallen stock	21,534	0	22,868	0	19,471	0
Emergency-slaughtered animals	1,336	0	1,607	0	1,889	0
AM animals[1]	0	0	0	0	0	0
Healthy slaughter animals	0	0	1	0	1	0
Clinical suspects	0	0	0	0	0	0
Total	**22,870**	**0**	**24,476**	**0**	**21,361**	**0**

[1] Animals with clinical signs at ante-mortem.

Source: EFSA (the European Food Safety Authority), 2023.

As BSE is a notifiable disease, anyone noticing symptoms of BSE in an animal must notify a veterinary practitioner and, hence, the 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. This applies to 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 disposed of as specified risk material irrespective of the result of the confirmatory test. At the slaughter line, the carcasses next to the test-positive animal are also disposed of as specified risk material (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. The surveillance programme has been revised a few times since 2009 due to amendments to EU legislation (see Table 6 on page 24). 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 have been 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.

BOX 8
Supplementary surveillance for brucellosis

Surveillance in cattle

The Danish Veterinary and Food Administration (DVFA) collaborates with the national reference laboratory to offer laboratory examination of bovine abortion material (foetuses, placentas and blood samples from cows).

In post-mortem examinations, and microbiological- and histological examinations, samples are examined for brucellosis, bovine virus diarrhoea and any new emerging infections causing abortion in cattle. In 2023, 48 aborted foetuses from cattle underwent laboratory testing under this scheme, and all tested negative for *Brucella* spp. and bovine virus diarrhoea. The examination scheme supplements the passive surveillance for bovine brucellosis and provides additional documentation to prove that the Danish cattle population is free from brucellosis.

Surveillance in sheep and goats

The DVFA collaborates with the national reference laboratory to offer laboratory examination of abortion material from sheep and goats (foetuses, placentas and blood samples from dam).

In post-mortem examinations, and microbiological- and histological examinations, samples are examined for brucellosis, Q fever, *Toxoplasma gondii, Chlamydia abortus* and *Campylobacter foetus*.

In 2023, two goat foetuses and 26 sheep foetuses were submitted for examination. *Toxoplasma gondii* was detected in seven foetuses from the same sheep herd. Moreover, hydrocephalus was seen in three lambs. In the two goat foetuses, no infectious cause was detected.

The examination scheme is a supplement to the passive surveillance for *Brucella melitensis*. It provides additional documentation to prove that the Danish sheep and goat populations are free from brucellosis.

Since 2011, the Danish surveillance programme has comprised post-mortem examination of all slaughtered animals as part of the meat inspection programme at slaughterhouses.

The results of the Danish BSE surveillance programme in the period 2021 - 2023 are shown in Table 7 on page 24.

Bovine virus diarrhoea

Denmark became recognised as officially free from bovine virus diarrhoea (BVD) by Commission Implementing Regulation (EU) 2022/1218 of 14 July 2022. In 2023, there were no BVD outbreaks in bovine establishments in Denmark.

Denmark initiated a systematic voluntary eradication programme for BVD in 1994. The voluntary programme was replaced by a compulsory surveillance programme in 1996, and BVD became notifiable in Denmark. The programme was carried out jointly by the Danish Veterinary and Food Administration (DVFA) and the Danish cattle industry. 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 establishments, except for a few, were considered free from BVD. Movement restrictions were imposed on the remaining infected establishments, and since 2006, BVD has only occurred sporadically. The latest outbreak was confirmed in 2019 and comprised two establishments considered a single epidemiological unit.

The present 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 establishments four times a year. Cattle from beef establishments are sampled at slaughterhouses following a computer-based selection of establishments for sampling. Furthermore, bulls at semen collection centres are regularly tested according to the test regime required by the provisions of Commission Delegated Regulation (EU) 2020/686.

In 2023, 19 suspected cases of BVD were reported to the DVFA, 11 of which were suspected due to positive serology, seven cases were contact herds, and one case was suspected due to clinical symptoms, although that case was rejected by a Veterinary Inspection Unit of the DVFA based on an evaluation of the clinical symptoms. Official restrictions were imposed on the establishments under suspicion while confirmatory laboratory testing was conducted at the national reference laboratory. The presence of BVD virus in or transmission of BVD virus from any of the suspected establishments was ruled out by confirmatory testing.

Table 8: Bulk milk samples and blood samples examined under the Danish bovine virus diarrhoea surveillance programme, 2021 - 2023

Year	Bulk milk samples	Blood samples from beef herds
2021	10,867	19,547
2022	10,491	18,898
2023	9.915[1]	17,362

[1] Samples were taken from 2,290 dairy herds in 2023..

Source: SEGES Innovation, 2024.

The number of bulk milk samples and blood samples from beef herds examined for BVD in the period 2021 - 2023 are given in Table 8.

Enzootic bovine leukosis

The latest case of enzootic bovine leukosis (EBL) in Denmark occurred in 1990, and Denmark has been officially free from EBL since 1991. The disease-free status of Denmark is set out in Part I of Annex IV to Commission Implementing Regulation (EU) 2021/620.

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 has comprised post-mortem examination of all slaughtered animals as part of the meat inspection programme at slaughterhouses. In 2023, 441,749 slaughtered animals were inspected. All tested negative. Furthermore, bulls at semen collection centres are regularly tested in accordance with the provisions of Commission Delegated Regulation (EU) 2020/686. Cattle intended for export to certain countries outside the EU are also tested. In 2023, 575 animals were tested at semen collection

The latest case of enzootic bovine leukosis (EBL) in Denmark occurred in 1990, and Denmark has been officially free from EBL since 1991.

centres and in connection with animal export. They all tested negative.

In 2023, the Danish Veterinary and Food Administration (DVFA) was notified of four cases of suspected EBL due to clinical symptoms. Three of those cases were rejected by a Veterinary Inspection Unit of the DVFA based on an evaluation of the clinical symptoms. Restrictions were imposed on the fourth establishment while laboratory testing was conducted at the national reference laboratory. The suspected case tested negative.

Infectious bovine rhinotracheitis/ infectious pustular vulvovaginitis

The latest case of infectious bovine rhinotracheitis (IBR) in Denmark occurred in 2005 in one animal. Denmark has been officially free from IBR since 1992. The disease-free status of Denmark is set out in Part I of Annex V to Commission Implementing Regulation (EU) 2021/620.

In April 1984, a national serological surveillance programme intended to demonstrate the absence of IBR was implemented. The surveillance programme includes testing for IBR antibodies in bulk milk samples from dairy cattle and blood samples from beef cattle. Bulk milk samples are collected from all dairy establishments on a yearly basis.

Blood samples from beef cattle herds are sampled at slaughterhouses following a computer-based selection of establishment for sampling.

Furthermore, bulls at semen collection centres are regularly tested in accordance with the provisions of Commission Delegated Regulation (EU) 2020/686. Cattle intended for export to certain countries outside the EU are also tested. To prevent the introduction of IBR into Denmark, samples are collected from all bovine establishments based on the estimated risk of IBR.

In 2023, the DVFA was notified of 17 cases of suspected IBR, 15 of which were suspected due to positive serological tests and two cases were contact establishments. Official restrictions were imposed on all establishments under suspicion while laboratory testing was performed. Samples of the suspected cases all tested negative for IBR at the national reference laboratory.

The number of bulk milk samples and blood samples from beef herds examined for IBR in the period 2021 - 2023 are given in Table 9.

Table 9: Bulk milk samples and blood samples examined under the Danish infectious bovine rhinotracheitis surveillance programme, 2021 - 2023

Year	Bulk milk samples	Blood samples from beef herds
2021	2,639	11,196
2022	2,467	10,902
2023	2,340[1]	10,097

[1] Samples were taken from 2,248 dairy herds in 2023.

Source: SEGES Innovation, 2024.

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. In 2023, Maedi-visna was found in one surveillance sample from a sheep. The sample had been collected as part of a voluntary control and surveillance programme for lentivirus.

Information pertaining to the WOAH-listed diseases in sheep and goats is given in Table 10.

Table 10: Latest occurrence of WOAH-listed sheep and goat diseases in Denmark

Disease	Latest occurrence
Caprine arthritis/encephalitis	2022
Contagious agalactia[1]	Never reported
Contagious caprine pleuropneumonia	Never reported
Infection with *Chlamydophila abortus* (enzootic abortion of ewes, ovine chlamydiosis)[1]	Never reported
Infection with peste des petits ruminants virus	Never reported
Maedi-visna[2]	Infection/infestation
Nairobi sheep disease[1]	Never reported
Ovine epididymitis *(Brucella ovis)*	Never reported
Salmonellosis *(Salmonella abortusovis)*	Never reported
Scrapie (transmissible spongiform encephalopathy, classical scrapie)	Never reported
Sheep pox and goat pox	1879

[1] The disease is not notifiable in Denmark.
[2] One sheep from one holding tested positive in a serological test in 2023, but no clinical signs were observed.

Caprine arthritis/encephalitis

Caprine arthritis/encephalitis is an enzootic infection most often recorded on the basis of serological findings. The disease occurs sporadically 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. Establishments included in this programme must be tested every three years to maintain the disease-free status.

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

In 2023, 308 samples were submitted for serological testing. All samples tested negative for caprine arthritis/encephalitis antibodies.

Maedi-visna

Maedi-visna is present in Denmark. 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 2023, 1606 samples from sheep were submitted for serological testing. One sample tested positive for Maedi-visna antibodies.

Transmissible spongiform encephalopathy

Transmissible spongiform encephalopathies (TSEs) cover several diseases that affect sheep, goats, and cattle. In cattle, TSE is called bovine spongiform encephalopathy (BSE), while in sheep and goats it is called scrapie (classical and atypical scrapie).

Classical scrapie has never been reported in Denmark, whereas the first case of atypical scrapie was diagnosed in Denmark in 2006 and the latest case in 2022 in a 7-year-old goat. However, cases of atypical scrapie are anticipated as this disease may appear spontaneously in old animals.

A comprehensive Danish surveillance programme for TSE in sheep and goats started in 2002. Since then, more than 70,000 animals have been tested for TSE, which is quite a large number considering that the Danish population of sheep and goats is rather small. For population data, see Chapter 4.

TSE is suspected if an animal has symptoms corresponding to the disease or if the result of a rapid test is positive/inconclusive. The national reference laboratory investigates the test material from the animal. Meanwhile, official movement restrictions are imposed on the establishment of origin and/or other establishments in which the animal may have been exposed to TSEs.

The first surveillance programme was initiated in Denmark in 1988 when scrapie became notifiable. That surveillance programme was a passive surveillance system. Besides the passive

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

A major amendment to the TSE Regulation concerning imports was made in 2013 to approximate EU legislation and the WOAH Terrestrial Animal Health Code.

surveillance, animals were only tested under a voluntary scheme from 1995 to 2002. Mandatory active surveillance was initiated in 2002, and in 2003 the national surveillance programme was extended to comprise full testing of all fallen stock animals aged over 18 months.

The Danish TSE surveillance programme implements the European TSE legislation as laid down in Commission Regulation (EC) No. 999/2001. Following the extension of national surveillance programme in 2003, Denmark was granted additional guarantees regarding stringent import rules. In 2012, Denmark revised the national programme to become a testing scheme under which only random samples of sheep and goats older than 18 months were tested. That revision was possible because of the substantial number of TSE tests performed during the preceding eight-year period. Tests which all tested negative for classical scrapie. Following the revision, the sample size has depended on the population size and the rules laid down in the TSE Regulation (Council Regulation (EC) No. 999/2001) as amended (Annex III).

A major amendment to the TSE Regulation concerning imports was made in 2013 to approximate EU legislation and the WOAH 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 like Denmark with a national control programme for classical scrapie, the most stringent EU rules on imports still apply.

The results of the surveillance programme for TSE in sheep and goats in Denmark in the period 2021 - 2023 are shown in Tables 11 and 12.

In total, 499 sheep and 103 goats were tested for TSE in 2023

Table 11: Results of the Danish surveillance programme for TSE in sheep, 2021 - 2023

Category	2021		2022		2023	
	Animals tested	Positive animals	Animals tested	Positive animals	Animals tested	Positive animals
Animals not slaughtered for human consumption	455	0	504	1	499	0
Healthy slaughter animals	0	0	0	0	0	0
Cases of clinically suspected TSE	0	0	0	0	0	0
Total	**455**	**0**	**504**	**1**	**499**	**0**

Source: The European Food Safety Authority (EFSA), 2023.

Table 12: Results of the Danish surveillance programme for TSE in goats, 2021 - 2023

Category	2021		2022		2023	
	Animals tested	Positive animals	Animals tested	Positive animals	Animals tested	Positive animals
Animals not slaughtered for human consumption	107	0	103	0	103	0
Healthy slaughter animals	30	0	0	0	0	0
Cases of clinically suspected TSE	0	0	0	0	0	0
Total	**137**	**0**	**103**	**0**	**103**	**0**

Source: The European Food Safety Authority (EFSA), 2023.

2.4 Pig diseases

African swine fever has never been reported in Denmark.

The Danish pig production is characterised by large intensive establishments. Approximately 2,400 Danish pig farms are managed according to the specific pathogen-free (SPF) programme, which means that pigs are free from certain diseases. Approximately 80% of all pigs born in Denmark and 100% of all traded breeding pigs have the SPF status.

Approximately 90% of Danish pig meat and meat products are exported, and approximately 50% of all piglets are exported as live animals according to the Danish Agriculture and Food Council.

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

Information pertaining to the WOAH-listed diseases in pigs is given in Table 13.

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 2013, new EU legislation entered into force 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 washing and disinfection of transport vehicles when they enter EU territory.

ASF reached the eastern territories of the EU in 2014. Together with the other EU Member States, Denmark has taken great precautions to control and curb the spread of the virus. The Danish Veterinary and Food Administration (DVFA) constantly

Table 13: Latest occurrence of WOAH-listed pig diseases in Denmark

Year	Latest occurrence
Infection with African swine fever virus	Never reported
Infection with classical swine fever virus	1933
Infection with porcine reproductive and respiratory syndrome (PRRS) virus	Disease present
Infection with *Taenia solium* (porcine cysticercosis)	Disease absent

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

aims to improve the surveillance programmes, the veterinary contingency capabilities and the information given to the operators and hunters to prevent the disease from spreading to Denmark.

In 2023, 294 samples from Danish pigs were tested under a supplementary surveillance programme for ASF (and classical swine fever (CSF)). All tested free from ASF and CSF. See Box 9 on page 35 for more information on the surveillance programme. In addition, 242 samples from pigs were tested for ASF. Samples are, for example, tested prior to export to certain countries outside the EU. All samples tested negative.

As a precaution, CSF is routinely suspected if a pig shows clinical symptoms of ASF. The DVFA was notified of one suspected case of ASF in 2023. The case was reported due to clinical symptoms in animals at a slaughterhouse. The establishment of origin underwent thorough clinical examination and laboratory testing, and it was subjected to official restrictions by the relevant Veterinary Inspection Unit while epidemiological investigation and the laboratory testing were performed. However, all samples tested negative for ASF and CSF.

Table 14: Serum samples from pigs examined under the Danish classical swine fever surveillance programme, 2021 - 2023

Year	Samples
2021	30,080
2022	32,840
2023	24,952

In 2023, the DVFA was notified of two suspected cases of CSF. Both tested negative.

Classical swine fever

The latest 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 that 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 Commission Delegated Regulation (EU) 2020/686.
- Sampling of animals intended for export to certain countries outside the EU.

As a supplement to the serological surveillance, pig carcasses submitted for post-mortem examination are tested for CSF and African swine fever (ASF). Further details are given in Box 9 on page 35.

The number of samples examined in the period 2021 - 2023 is given in Table 14. Due to trade fluctuations, the number of samples tested for CSF varies significantly from year to year.

If any animals in an establishment show clinical symptoms that give rise to the suspicion of CSF, the establishment will be placed under official restrictions while laboratory testing and epidemiological investigations are conducted. As a precaution, ASF is routinely suspected if a pig shows clinical symptoms of CSF.

In 2023, the DVFA was notified of two suspected cases of CSF. One case was reported due to clinical signs in pigs at the ante-mortem inspection at a slaughterhouse. The other case was reported because animals had tested positive in a serological test performed prior to export. The establishment of origin underwent thorough clinical examination

and laboratory testing, and it was subjected to official restrictions by the relevant Veterinary Inspection Unit while epidemiological investigation and the laboratory testing were performed. All samples tested free from CSF and ASF.

The public are encouraged to inform the Danish Veterinary and Food Administration of sightings of live wild boars

The measures to eradicate wild boars in Denmark have resulted in no wild-living wild boars in Denmark by the end of 2022. Therefore, the public are encouraged to notify the DVFA if they observe wild boars. This contributes to the continuing eradication of wild-living wild boars in Denmark. Reports can easily be made by using the smartphone app 'VildsvineTip' (in English: Wild Boar Tip-off). Sightings of both dead and live animals are stored in the wild boar database.

Each record comprises the date, condition of animal(s) (i.e., 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 into the database about animals killed. The relevant Veterinary Inspection Unit then collects samples from the dead wild boars (whether shot, road-killed or otherwise deceased) for the purpose of testing them for *Trichinella* spp., ASF, CSF and Aujeszky's disease. The laboratory enters the test results into the database. The person reporting the wild boar will also be notified of the test results though the app. Carcasses of dead wild boars are collected and disposed of. All results are publicly available at **http://vildsvin.fvst.dk** (in Danish). Sightings of wild boars reported in 2023 are illustrated in Figure 3.

Reports can easily be made by using the smartphone app 'VildsvineTip' (in English: Wild Boar Tip-off).

Figure 3. Registered dead wild boars of foreign origin washed ashore in 2023

To mitigate the risk of ASF being introduced into Denmark, a political agreement was made in 2018 to strengthen the efforts against ASF.

Initiatives to prevent the introduction of African swine fever into Denmark

The first outbreak of African Swine Fever (ASF) in EU Member States occured in the Baltics in February 2014. Denmark has closely monitored the development and spread of ASF ever since. Recent developments have therefore led to a more cautious and preventive approach as an attempt to curb the threat.

To mitigate the risk of ASF being introduced into Denmark, a political agreement was made in 2018 to strengthen the efforts against ASF. Subsequently, this agreement has been replaced by an action plan. The action plan consists of a series of measures, which together reduce the risk that the ASF virus will be introduced into Danish territory. The measures comprise veterinary actions to keep ASF out of Denmark and to make everyone prepared in case ASF is introduced into Denmark. The main veterinary actions are described below.

- The construction of a wild boar-proof fence along the Danish border to Germany to prevent reintroduction of wild boars into Denmark.
- Actions to be taken if wild boars enter Denmark despite the fence:
  > Intensive efforts will be made to find and shoot the free-ranging wild boars in Denmark.
  > Wild boars can be hunted 24 hours a day.
- Strengthened cooperation with the Danish Hunters' Association.
- Guidance for operators with free-ranging livestock on initiatives on biosecurity, food litter and kitchen offal.
- Information for travel agencies about ASF.
- Initiatives to provide information on biosecurity to the Danish Armed Forces present in ASF-affected areas.
- 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.

Porcine reproductive and respiratory syndrome

Porcine reproductive and respiratory syndrome (PRRS) virus is a notifiable disease that is present in Denmark. Operators and local veterinarians are obliged to contact the veterinary authority if they observe clinical suspicions of PRRS in an establishment.

In 2023, the Danish Veterinary and Food Administration (DVFA), the Danish Agriculture

Denmark has closely monitored the development and spread of ASF since the first outbreak of the disease in the Baltics in February 2014.

& Food Council (farmers organisation), the Danish Veterinary Association and 'Danske Slagterier' (the industry association for Danish slaughterhouses) started jointly developing a national reduction strategy. The PRRS antibody status must be known of all establishments with pigs. The requirement for a PRRS health status applies to all pig establishments with more than 10 breeding pigs or more than 100 pigs in total. This also applies to organic and free-range establishments.

Additional requirements are imposed on all PRRS antibody-positive establishments. The private veterinarians attached to such establishments must issue a monthly statement as to whether the animals show clinical signs of PRRS.

Regarding the reduction strategy, the plan is that when all establishments have a declaration of their PRRS antibody status, the DVFA and local veterinarians will look into the possibility of reducing the disease locally by means of eradication plans made by the local veterinarians.

Porcine epidemic diarrhoea virus

Porcine epidemic diarrhoea (PED) has never been recorded in Denmark despite its wide distribution in Central and Southern Europe since the 1990s.

PED is a notifiable disease in Denmark. The symptoms are similar to those of transmissible gastroenteritis (TGE), which is also a notifiable disease that has never been reported in Denmark.

Due to the increased focus on PED in Northern America in 2013, the Danish Veterinary and Food Administration initiated serological screening of blood samples from sows for PED 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 underwent specific PED ELISA testing developed by the Technical University of Denmark. The ELISA was developed to detect both the original European and the Asian/American strains. All samples tested negative. The samples originated from 1,352 sow establishments. In statistical terms, it was concluded with 92% certainty that the prevalence of the PED virus in Denmark was less than 1% by 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 2023, 143 samples were examined as part of the surveillance programme. All samples tested negative for PED.

143

In 2023, 143 samples were examined as part of the surveillance programme. All samples tested negative for PED.

BOX 9
Supplementary surveillance for African swine fever and classical swine fever

Samples from carcasses of pigs submitted by operators for general post-mortem examination at a 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 anamnesis, and relevant organ material is collected for the testing for ASF and CSF. If a sample tests positive, the Danish Veterinary and Food Administration is notified immediately of the suspected case of ASF or CSF.

On a weekly basis, samples from at least six pig establishments are tested for ASF and CSF under this programme. In 2023, samples from 294 submissions were tested, all of which tested free from ASF and CSF.

2.5 Poultry diseases

In total, 10 outbreaks of HPAI H5N1 in poultry were confirmed in 2023.

The poultry production in Denmark comprises two major categorises: table egg production and meat production.

Over the past years, there has been an increase in outbreaks of highly pathogenic avian influenza (HPAI), and 2023 was no exception. Only few other poultry diseases listed by the WOAH were diagnosed in 2023, including one outbreak of Newcastle disease in captive birds and 26 outbreaks of avian chlamydiosis.

Information pertaining to the WOAH-listed avian diseases and infections is given in Table 15 on page 37.

Avian influenza

Avian influenza (AI) can be categorised into two types: highly pathogenic avian influenza (HPAI) and low pathogenic avian influenza (LPAI). Both types are notifiable in Denmark. HPAI has the potential of causing detrimental losses to the poultry industry if there is an outbreak at an establishment. In 2023, it was confirmed that the strain of the HPAI virus was H5N1 in all HPAI outbreaks. Moreover, one LPAI outbreak was detected in 2023.

Findings of virus in wild birds during the summer and early autumn of both 2022 and 2023 indicate that virus now persists in the wild bird population in Denmark during the summer as well. Before 2022, distinct seasonal fluctuations were observed in the occurrence of the HPAI virus in wild birds. There is correlation between the pattern of fluctuation and the migratory patterns of wild birds with an increase in detection rates as from October and a peak in February. In 2023, the HPAI virus was detected in species such as seagulls and terns, which form nesting colonies in Denmark. In total, 38 suspicions of HPAI due to clinical signs in poultry and other captive birds were reported to the Danish Veterinary and Food Administration in 2023. The first outbreak in poultry in 2023 was confirmed on 17 January 2023 on an establishment with turkeys.

A total of ten outbreaks of HPAI H5N1 in poultry were confirmed in 2023. The outbreaks were in establishments with various species: fattening turkeys, broilers, egg-laying hens, ducks, mallards and pheasants. In nine of the outbreaks, HPAI was suspected due to clinical findings. The last outbreak was confirmed by the results of tests taken under the routine surveillance programme targeted at

specific species of poultry, mainly ducks and geese. The establishment in question had both chickens and ducks, which were kept separately. The routine test samples were taken from ducks that showed no obvious clinical signs. None of the chickens at the establishment tested positive. The first outbreak of HPAI in the 2023/2024 season was confirmed on 6 November 2023 in an establishment with fattening turkeys. The last outbreak in the 2022/2023 season was confirmed on 26 September 2023 in an establishment with ducks and chickens. This highlights the fact that the presence of the virus has changed from distinct seasonal presence to year-round present.

An overview of all outbreaks of HPAI in poultry and other captive birds in 2023 is given in Table 16 at page 38. All outbreaks were reported to the WOAH through the World Animal Health Information System (WAHIS) and handled in accordance with Commission Delegated Regulation (EU) 2020/687 on rules for the prevention and control of certain listed diseases. Restriction zones of 3 km and 10 km were established around each outbreak. Poultry and other captive birds on the infected establishments were culled and disposed of through rendering plants. The cleaning and disinfection of the establishments were approved by the Danish Veterinary and Food Administration. The 3 km and 10 km restriction zones were lifted on days 21 and 30, respectively, at the earliest following the approval of the cleaning and disinfection and the screening of establishments in the zones without the detection of any more outbreaks. The HPAI epidemic continued in 2024 with additional outbreaks in poultry establishments.

The first outbreak of HPAI in the 2023/2024 season was confirmed on 6 November 2023

Table 15: Last occurrence of WOAH-listed poultry diseases in Denmark

Avian disease or infection	Latest occurrence
Avian chlamydiosis[1]	Disease present
Avian infectious bronchitis2	Suspected, but not confirmed
Avian infectious laryngotracheitis	2022
Duck virus hepatitis2	Suspected, but not confirmed
Fowl typhoid	2002
Infection with highly pathogenic avian influenza A viruses (poultry)	Disease present
Infection with highly pathogenic avian influenza A viruses (captive birds)	2022
Infection with low pathogenic avian influenza viruses transmissible to humans	Never reported
Infection with *Mycoplasma gallisepticum* (Avian mycoplasmosis)	1967
Infection with *Mycoplasma synoviae* (Avian mycoplasmosis)2	Disease absent[3]
Infection with Newcastle disease virus	Disease present
Infectious bursal disease (Gumboro disease) 2	Disease absent[1]
Pullorum disease	2019
Turkey rhinotracheitis2	2007

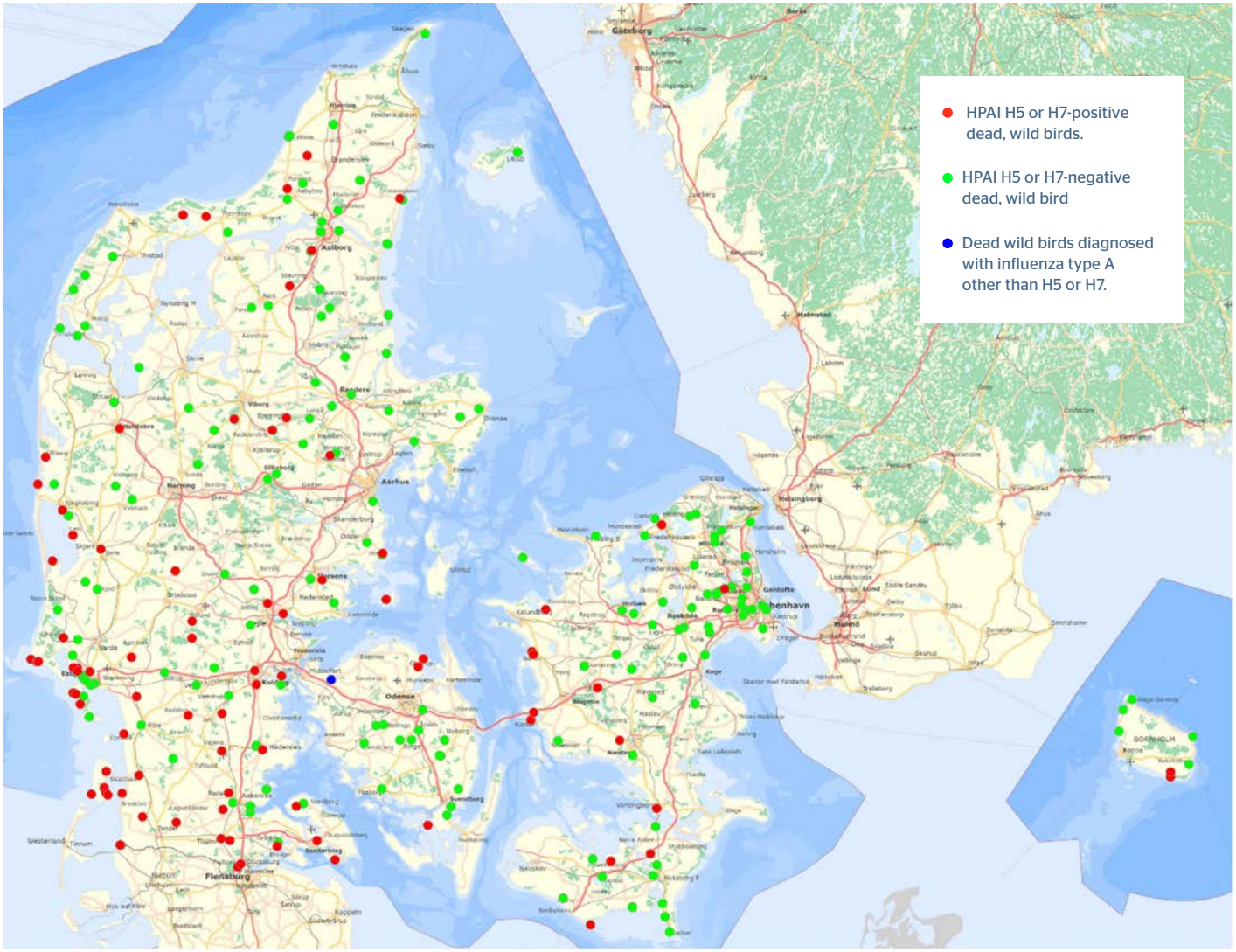
[1] Occurrence mainly in ornamental, hobby and backyard birds.
[2] Not notifiable in Denmark
[3] Year of latest outbreak is not known.

Source: The Poultry Database of the Danish Agriculture & Food Council, 2023

Table 16: Outbreaks of avian influenza in poultry and other captive birds in Denmark, 2023

Outbreak number	Municipality	Confirmed (date)	Virus type	Susceptible birds	Category	Type of holding
1	Hedensted	01/01/2023	H5N1	50,000	Poultry	Laying hens
2	Slagelse	17/01/2023	H5N1	15,000	Poultry	Fattening turkeys
3	Gribskov	17/03/2023	H5N1	70	Poultry	Hens, ducks and geese
4	Sønderborg	25/04/2023	H5N1	30,300	Poultry	Breeding stock, broilers
5	Nyborg	12/07/2023	H5N1	60	Poultry	Laying hens
6	Guldborgsund	27/09/2023	H5N1	43	Poultry	Ducks and hens
7	Lundby	06/11/2023	H5N1	33,800	Poultry	Fattening turkeys
8	Alslev	11/11/2023	H5N1	2,300	Poultry	Hens, broilers, turkeys
9	Tønder	21/11/2023	H5N1	2,700	Poultry	Pheasants
10	Brændholt	13/12/2023	H5N1	2,100	Poultry	Ducks and hens

Figure 4. Dead wild birds tested for avian influenza in 2023



Note that dead birds found in close geographical and temporal proximity of each other are only represented on the map by one dot.
Red dot: HPAI (2023 all were H5N1); green dot: negative; blue dot: LPAI (2023: H5)
Source: ai.fvst.dk

The DVFA was notified of six early warnings of AI in 2023, and samples were taken from the relevant flocks.

The surveillance programme for avian influenza in poultry and game birds

Surveillance for AI has been in place throughout the country since 2006. The surveillance programme was revised in 2015 following a risk assessment. The surveillance programme is outlined in a Danish Executive Order, which came into effect on 1 February 2022. The requirement to give notification of early warning signs of AI still applies to all categories of poultry, whereas routine surveillance includes the sampling at establishments with certain types of poultry (quails and waterfowl, such as ducks and geese species, as well as other game birds). In Box 10 on page 42, the early warning signs are described in detail. Based on previous experiences from the years of surveillance for AI in all categories of poultry establishments, including hens and other very susceptible breeds, it was evident that an effective early warning scheme is sufficient and effective for detecting outbreaks in such flocks. The Danish Veterinary and Food Administration was notified of six early warnings of AI in 2023, and samples were taken from the relevant flocks. One of the samples tested positive for HPAI H5N1. The other five samples tested free from AI and Newcastle disease. One outbreak of HPAI was detected through the routine surveillance programme when an establishment with ducks tested positive.

The active surveillance programme for AI in poultry is risk-based and mainly targeted at establishments with poultry species that generally do not display any clinically significant signs when infected with HPAI. Accordingly, the purpose of the programme is to disclose any subclinical infection or silent spread in flocks of:

- breeding ducks
- breeding geese
- fattening ducks
- fattening geese
- quails
- farmed game birds *(Anseriformes)* for restocking

All poultry establishments in the target group with more than 100 animals are included in the programme. Tracheal and cloacal swap samples are taken from 10 birds on each holding. The samples are analysed virologically at the national reference laboratory (NRL) using the RT-PCR method. If traded or moved, poultry and hatching eggs have to be accompanied by a certificate stating that samples taken from the flock of origin in the preceding two months tested negative for AI. Fattening ducks and geese are tested before slaughter. Breeder ducks and geese are tested once a year. All ducks and geese have to be tested no more than two months before movement. Farmed game birds (mallards) are tested before movement and four times during the hunting season. All farmed game birds must be tested no more than two months before movement. The samples must also be analysed at the NRL.

The results of the Danish surveillance programme for AI in poultry and game birds in 2023 are shown in Table 17.

In Box 10 on page 42, the avian influenza early warning signs are described in detail.

Table 17: Results of the active Danish surveillance programme for avian influenza in poultry and game birds for restocking in 2023

	Holdings tested[1]	Positive holdings
Fattening and breeding geese	4	0
Fattening and breeding ducks	46	1
Farmed game birds	88	1
Quails	0	0
Holdings not included in the surveillance programme	0	0
Total	**138**	**2**

[1] Some flocks/holdings are tested more than once a year. The figures only include one annual testing per flock/holding.

Source: The Poultry Database of the Danish Agriculture & Food Council, 2023.

Animal Health in Denmark 2.5 Poultry diseases 39

The surveillance programme for avian influenza in wild birds

The avian influenza virus (AIV) continued to be prevalent in the wild bird population in 2023. It is assumed that the reservoir and natural host for the AIV are wild birds, especially waterfowl species. The collection and sharing of data, and knowledge between Member States are imperative to maintain appropriate strategies and measures of biosecurity with the intention of protecting the poultry sector. Since the AIV has the potential of infecting both humans and other mammals, the surveillance for AIV remains important.

Since January 2011, the surveillance programme for AIV in wild birds has consisted of an EU-coordinated passive surveillance programme and active national surveillance. As part of the passive surveillance, wild birds found dead are tested for AIV at the national reference laboratory. The DVFA encourages the public to report findings of dead wild birds, which can be done using the smartphone app 'Fugle-influenzaTip' (in English: Bird Flu Tip-off). As part of the active surveillance programme, live birds with an increased risk of exposure to AIV and hunted game birds are sampled for virological examination by means of cloacal and tracheal swabs. The results of the active surveillance programmes are displayed in Table 18 and the results of the passive surveillance in Figure 4. HPAI H5N1 was the only HPAI subtype detected. The proportion of wild birds tested positive for HPAI is shown in Table 19 on page 41 (passive surveillance).

LPAI virus was detected in one pool sample taken in connection with the active surveillance for LPAI in live wild birds in 2023.

Finding of dead wild birds can be reported via the app 'FugleinfluenzaTip'

Table 18: Results of the active Danish surveillance programme for avian influenza in wild birds, 1 January to 31 December 2023

Birds sampled	Passive surveillance (dead or sick wild birds)	Active surveillance (live wild birds)
Samples/pools	406 birds (812 samples)	674 birds (235 samples[1])
Influenza A-positive birds	175	31 pools[2]
LPAI H5-positive birds	0	1 pool[2]
LPAI H7-positive birds	0	0
HPAI H5-positive birds	174	7
HPAI H7-positive birds	0	0

[1] Pools of cloacal swabs taken from up to five birds of the same species at the same time and location.
[2] The actual number of positive birds is not known. If a sample pool is positive, at least one of the birds in the pool was positive. When a pool tests positive for the HPAI virus, samples from the individual birds in the sample pool are tested individually.

The Danish Veterinary and Food Administration (DVFA) continuously monitors the results of tests made as part of the surveillance programme for avian influenza virus (AIV) in wild birds. Those results as well as data on national outbreaks, data collected under the Animal Disease Information System (ADIS) on AIV detected in poultry and wild birds and updated information on migratory birds are gathered to carry out a risk assessment to determine the level of risk, that poultry and captive birds in Denmark becoming infected by wild birds. On 17 April 2023, the risk of highly pathogenic avian influenza was lowered from 'high' to 'medium' following a rapid risk assessment. That level was maintained until 13 December 2023 when the level of risk was raised from 'medium' to 'high' following a new risk assessment.

Strengthened biosecurity measures due to highly pathogenic avian influenza epidemics

On 23 November 2022, an Executive Order on Compulsory Housing Measures for Poultry and Captive Birds entered into force. This Executive Order was revoked on 17 April 2023 when, based on a risk assessment, the level of risk was lowered to 'medium'. Compulsory housing measures for poultry and captive birds were implemented again on 15 December 2023 as a consequence of the risk being raised to 'high'. Under the Executive Order on Compulsory Housing, all poultry and other captive birds must be housed indoors or confined under roof, net or wire to protect the poultry from contact with wild birds. The requirements applied to the whole country and to all categories of poultry and captive birds. Establishments with less than 100 captive birds were excepted from the Executive Order on compulsory housing if the products from the birds were eaten by the producing household and if there was no direct or indirect contact with poultry. In addition, all fairs, markets, shows and other gatherings of poultry or other captive birds were prohibited across the country.

However, the DVFA could issue permission to fairs, markets, shows and other gatherings of captive birds upon application provided that only establishments with captive birds with less than 100 birds were represented and that there was no direct or indirect contact between those establishments and poultry establishments.

Newcastle disease (ND)

If poultry show clinical symptoms of AI, ND will also be suspected, and official restrictions will be imposed on the establishment while an epidemio-

On 15 December 2023, the risk of higly pathogenic avian influenza was raised to 'high'.

Table 19: Highly pathogenic avian influenza in dead wild birds 2023, listed by bird species

Species	H5 (unknown N type)	H5N1	H5N3	H5N5	H5N8	Positive birds per species
Barnacle goose/*Branta leucopsis*	0	23	0	0	0	23
Black-headed gull/*Larus ridibundus*	0	77	0	0	0	77
Common eider/*Somateria mollissima*	0	1	0	0	0	1
Common kestrel/*Falco tinnunculus*	0	1	0	0	0	1
Eurasian buzzard (common buzzard)/ *Buteo buteo*	0	18	0	0	0	18
Eurasian wigeon/*Anas penelope*	0	1	0	0	0	1
Greylag goose/*Anser anser*	0	9	0	0	0	9
Herring gull/*Larus argentatus*	0	5	0	0	0	5
Lesser black-backed gull/*Larus fuscus*	0	1	0	0	0	1
Mute swan/*Cygnus olor*	0	11	0	0	0	11
Northern gannet/*Morus bassanus*	0	1	0	0	0	1
Peregrine falcon/*Falco peregrinus*	0	3	0	0	0	3
Pink-footed goose/*Anser brachyrhynchus*	0	4	0	0	0	4
Red kite/*Milvus milvus*	1	0	0	0	0	1
Sandwich tern/Sterna sandvicensis	0	7	0	0	0	7
White-tailed eagle/*Haliaeetus albicilla*	0	1	0	0	0	1
Whooper swan/*Cygnus cygnus*	0	10	0	0	0	10
Total positive birds	**1**	**173**	**0**	**0**	**0**	**174**

Source: Statens Serum Institut (SSI) and the University of Copenhagen, 2023.

A prophylactic vaccination programme for ND has been in force in Denmark since 2005 and is compulsory for commercial poultry establishments.

logical investigation of the flock is carried out and laboratory testing is conducted. In practice, this means that all establishments suspected of an infection with AI due to clinical symptoms or tested under the early warning scheme are tested for both ND and AI.

A prophylactic vaccination programme for ND has been in force in Denmark since 2005 and is compulsory for commercial poultry establishments. The vaccination programme comprises hens and turkeys of both breeding and layer flocks. The vaccination of flocks of broilers kept free-range or slaughtered when older than 10 weeks and of turkeys for commercial production is also compulsory. Moreover, poultry and captive birds brought to gatherings, exhibitions and markets and wintering gamebirds for breeding the following spring must be vaccinated against ND.

On 20 June 2023, an outbreak of ND in an establishment with pigeons in Northern Jutland was confirmed. The suspicion had been raised based on clinical signs, including increased mortality amongst the pigeons. The establishment was part

1,000

The allotment facility was considered as one epidemiological unit, and the estimated total number of birds was 1,000.

of an allotment association with 37 bird owners. The allotment facility was considered as one epidemiological unit, and the estimated total number of birds was 1,000. Multiple species were kept in the allotments, including pigeons, parrots and hens. All birds from the allotments were culled, and 3 and 10 km restriction zones were set up around the establishment in accordance with the measures described in Commission Delegated Regulation (EU) 2020/687 on rules for the prevention and control of certain listed diseases.

BOX 10
Early warning scheme – a supplement to the surveillance for avian influenza

The avian influenza (AI) early warning parameters requiring the operator to notify the Danish Veterinary and Food Administration (DVFA), 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 over a three-day period.

Early warnings are reported to the DVFA, and samples are collected from 10 birds of the flock for virological examination by PCR.

Samples are also tested for Newcastle disease, as this disease is listed as an important differential diagnosis.

2.6 Equine diseases

In Denmark, more than 30 different horse breeds are being kept for riding, driving, breeding and other purposes. The breeding of riding horses focuses especially on promoting traits suitable for competition at an international level.

Only one of the WOAH-listed equine diseases is known to be present in Denmark: contagious equine metritis (CEM). Several cases of this disease were reported in the period 2019 - 2023. However, the number of cases has declined since 2020.

Equine viral arteritis (EVA) is notifiable and suspected to be present in Denmark, but no EVA infection has ever been confirmed.

Contagious equine metritis

Infections with *Taylorella equigenitalis*, which causes contagious equine metritis (CEM), were diagnosed in 16 horses in Denmark in 2023. All infections were in horses of the Icelandic or the Fjord breed. Most samples screen for CEM are collected in connection with breeding. Testing for CEM is also carried out in case of suspicions and in connection with international trade in horses and horse semen.

In 2023, Denmark revised the procedure for handling confirmed cases of CEM in horses. The conditions to be met for a horse to test free of the disease after having been infected have been further clarified, and official restrictions are imposed on all horses confirmed to have CEM. Those restrictions comprise the obligation to treat the disease and a prohibition on the use of the horse for breeding until it has tested negative for *T. equigenitalis*.

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.

Dourine, which is caused by the protozoan parasite *Trypanosoma equiperdum*, has never been reported in Denmark.

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.

Equine viral arteritis

Equine viral arteritis (EVA), which is caused by equine arteritis virus, has never been confirmed in Denmark. Serological examination is often carried out in connection with breeding and in case of clinical suspicions.

Glanders

Glanders, which is caused by infection with the *Burkholderia mallei* bacterium, has not been reported in Denmark since 1928. Serological examination is often carried out in connection with breeding and in case of clinical suspicions.

Information pertaining to equine diseases is given in Table 20.

Table 20: Occurrence of WOAH-listed equine diseases in Denmark

Equine disease	Latest occurrence
Contagious equine metritis	Disease present
Dourine	Never reported
Equine encephalomyelitis (Western)	Never reported
Equine infectious anaemia	1928
Equine influenza[1]	Suspected, but not confirmed[2]
Equine piroplasmosis[1]	Disease absent
Infection with *Burkholderia mallei* (glanders)	1928
Infection with African horse sickness virus	Never reported
Infection with equid herpesvirus-1 (EHV-1)[1]	Disease absent
Infection with equine arteritis virus (EVA)	Disease absent[3]
Venezuelan equine encephalomyelitis	Never reported

[1] The disease is not notifiable in Denmark.
[2] Due to widespread vaccination of competition horses and racehorses, incidents among those horses are rare and of a mild nature.
[3] Year of latest outbreak is not known.

2.7 Fur animal diseases

For many years, Denmark was among the world's leading producers of animal fur. By midsummer 2020, 1,147 establishments with mink with a population of approximately 15 million minks were registered in Denmark[1]. During the remainder of 2020, the COVID-19 pandemic had a severe impact on the Danish mink production. All minks at establishments were culled in 2020, and a temporary ban on mink farming was imposed in Denmark. The ban was lifted by the end of 2022. From 1 January 2023, mink farming could be resumed under strict surveillance and subject to the obligation to adhere to specific infection control requirements. Four establishments with mink resumed production in 2023 based on 5,887 breeding animals imported from Finland, Norway, Spain and Sweden. Production was limited, but is expected to grow.

Denmark also has a small commercial production of chinchillas, ferrets and rabbits, although most rabbits in Denmark are held as pets. The populations of wild rabbits are assumed to be limited in number and to exist only in restricted areas.

In total, Denmark exported approximately 164 fur animals in 2023. The number is low, and the animals were ferrets.

Rabbit haemorrhagic disease

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

In 2023, six cases of RHD were confirmed, three of which were in the same establishment, while the remaining three cases were in different hobby establishments with rabbits. All cases were reported and examined due to increased mortality. The wild population of rabbits in Denmark is considered a reservoir for the disease. Vaccination against RHD is allowed in Denmark.

164

In total, Denmark exported approximately 164 fur animals in 2023.

[1] Source: Kopenhagen Fur (owned by the Danish Fur Breeders' Association).

2.8 Fish diseases

In 2023, 197 aquaculture production businesses (APBs) producing fish were registered in Denmark. The majority were freshwater APBs, but 19 were marine APBs producing rainbow trout *(Oncorhynchus mykiss)* in net cages, and 13 APBs produced fish in saltwater tanks/raceways or closed recirculating facilities. The marine APBs are located in the Belt Sea, south and west of Zealand, along the eastern coast of Jutland and near the island of Samsoe.

The Danish aquaculture surveillance programme

Since 1970, Denmark has had an official disease surveillance programme comprising all approved APBs in the country. Common EU legislation on animal health conditions governing the placing on the market of aquaculture animals was introduced by Regulation (EU) 2016/429 of the European Parliament and of the Council. Subsequently, the

197

In 2023, 197 aquaculture production businesses (APBs) producing fish were registered in Denmark.

Table 21: Surveillance samples, including export samples, tested under the Danish aquaculture surveillance programme in 2023

Disease	Type of tissue sampled	Testing method	Samples tested in 2023[1]
Infection with epizootic haematopoietic necrosis virus	1	A	537
Infectious haematopoietic necrosis	1	A+B	1045
Infection with infectious salmon anaemia virus	2	B	908
Infection with salmonid alphavirus	2	B	284
Spring viraemia of carp	1	A	0
Viral haemorrhagic septicaemia	1	A+B	599

1: Kidney, spleen and heart (and in some cases brain).
2: Kidney, heart and gills.
A: Cultivation in cell culture followed by observation of cytopathic effect.
B: PCR test.
[1] Each sample tested is a pooled sample of up to 10 fish per sample.

surveillance programme has been conducted in accordance with the provisions of Commission Delegated Regulation (EU) 2020/689.

The aquatic animal health surveillance in Denmark consists of the following components: the obligation to report suspicions of animal diseases and abnormal mortalities, routine inspections and laboratory examination of surveillance samples.

In 2023, the Danish Veterinary and Food Administration carried out 201 inspections of APBs. The surveillance samples, including export samples, tested in 2023 are described in Table 21 on page 46.

Each sample tested is a pooled sample of up to 10 fish. The most common species tested is rainbow trout *(Oncorhynchus mykiss),* which constitutes approximately 91% of the production of fish at APBs. Some saltwater and freshwater APBs produce brown trout *(Salmo trutta),* salmon *(Salmo salar)* and brook trout *(Salvelinus fontinalis).* Those species are also tested under the surveillance programme. Samples from wild salmon *(Salmo salar)* and wild brown trout *(Salmo trutta)* are also collected for testing under the surveillance programme. A few APBs produce turbot *(Scophthalmus maximus)* and they are also sampled and tested for viral haemorrhagic septicaemia virus. The types of tissue sampled and the testing methods are also specified in Table 21 on page 46.

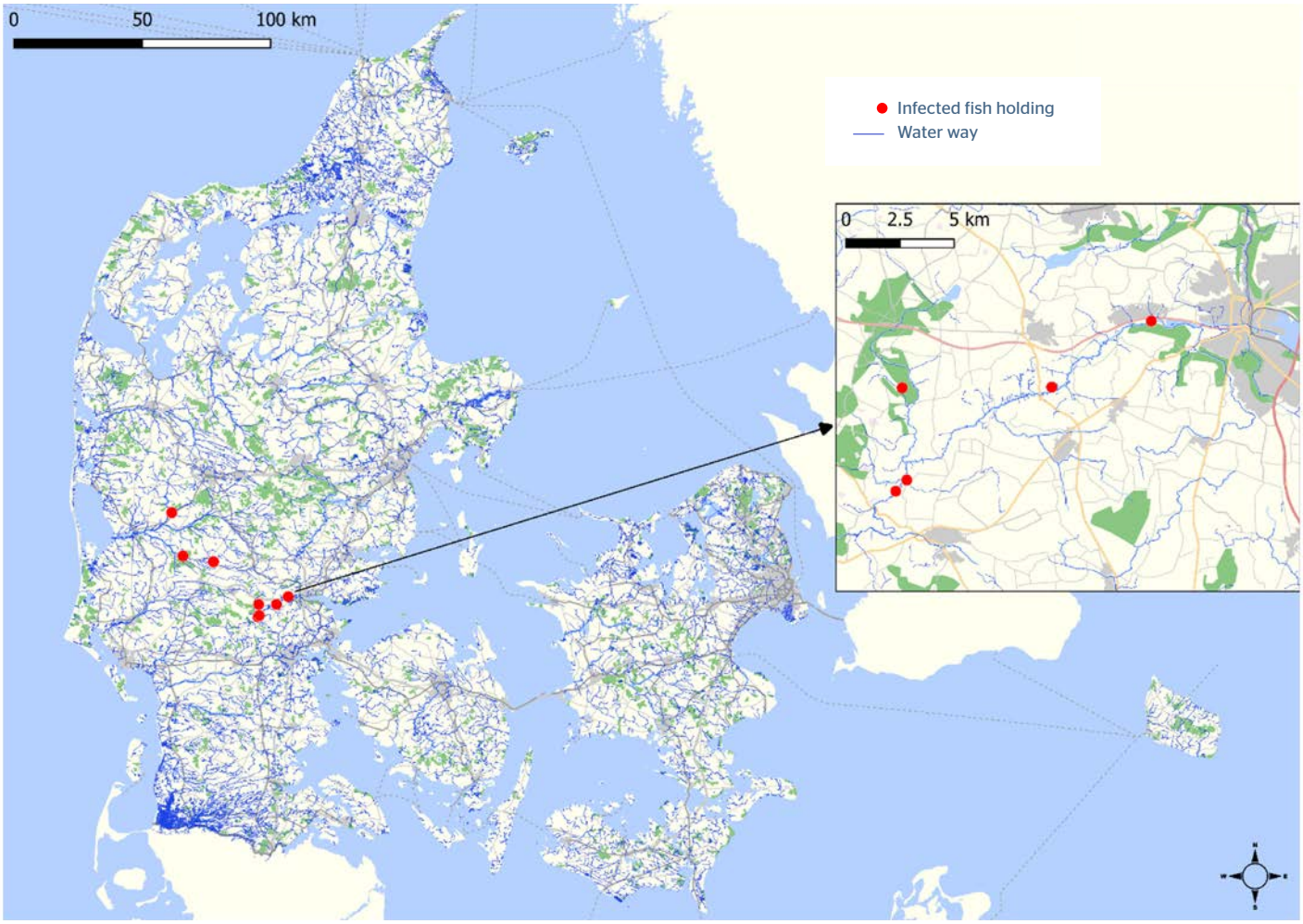
Denmark has 27 aquaculture production businesses that are declared IHN-free compartments.

Infectious haematopoietic necrosis

Denmark has 27 APBs that are declared IHN-free compartments and one compartment with an approved eradication programme for IHN.

In 2023, nine cases of infectious haematopoietic necrosis (IHN) were confirmed in Denmark (see Figure 5). All nine confirmed cases were from freshwater

Figure 5. Map of aquaculture production businesses infected with infectious haematopoietic necrosis in 2023



APBs. Most outbreaks could be explained epidemiologically by hydrodynamic conditions or by the movement of fish. One outbreak was confirmed in an IHN-free compartment. The Danish Veterinary and Food Administration (DVFA) has a national surveillance programme for IHN in accordance with Part III of Annex VI to Commission Delegated Regulation (EU) 2020/689 on rules for the prevention and control of certain listed diseases. An infected establishment may re-enter the surveillance programme for IHN provided that the DVFA has approved that the establishment has been emptied, cleaned, disinfected and fallowed for 6 weeks.

Infectious salmon anaemia virus

No infections with highly polymorphic region (HPR)-deleted infectious salmon anaemia virus (ISAV) have ever been reported in Denmark, and the whole territory is approved free from HPR-deleted ISAV by the European Union.

The disease-free status of Denmark is set out in Part I of Annex XIV to Commission Implementing Regulation (EU) 2021/620. However, an infection with HPR0 infectious salmon anaemia virus was detected in a facility for the restoration of wild salmon in 2019.

In 2023, nine cases of infectious haematopoietic necrosis (IHN) were confirmed in Denmark.

Table 22: Occurrence of WOAH-listed fish diseases in Denmark

Disease	Latest occurrence
Epizootic haematopoietic necrosis virus	Never reported
Infection with *Aphanomyces invadans* (epizootic ulcerative syndrome)	Never reported
Infection with *Gyrodactylus salaris*[1]	Suspected, but not confirmed
Infection with HPR-deleted infectious salmon anaemia virus	Never reported
Infection with HPR0 infectious salmon anaemia virus	2019[2]
Infection with salmonid alphavirus	Never reported
Infectious haematopoietic necrosis	Disease present
Koi herpesvirus disease	Disease present
Red sea bream iridoviral disease[1]	Never reported
Spring viraemia of carp	2003
Viral haemorrhagic septicaemia	2009

[1] The disease is not notifiable in Denmark.
[2] Infectious salmon anaemia virus of the genotype HPR0 was detected in a wild Atlantic salmon *(Salmo salar)* at a facility for the restoration of wild salmon. The salmon was caught in the river of Gudenåen.

The eradication programme for VHS in Danish marine waters has been completed, and Danish marine waters were declared free from VHS on 20 November 2023.

Koi herpesvirus disease

The latest occurrence of koi herpesvirus disease in Denmark was confirmed on 29 September 2023. Koi herpesvirus disease has never been reported in Danish carp establishments, but has occasionally been detected in imported ornamental koi carp and in garden ponds with koi carp.

Spring viraemia of carp

The latest occurrence of spring viraemia of carp in Denmark was in 2003. Denmark (whole territory) is approved free from spring viraemia of carp by the European Union according to Annex I to Commission Implementing Decision (EU) 2021/260. spring viraemia of carp has never been reported in any Danish carp establishments, but has occasionally been detected in imported ornamental carp with no access to natural waters.

Viral haemorrhagic septicaemia

The latest outbreak of viral haemorrhagic septicaemia (VHS) in Denmark was confirmed in January 2009, and the whole continental Denmark is approved as VHS-free by the European Union according to Annex XII to Commission Implementing Regulation (EU) 2021/620. The Danish programme for the eradication of VHS in continental Denmark 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.

In 2021, an eradication programme for VHS in Danish marine waters was approved by the EU. The eradication programme comprised two years of intensified surveillance in which 75 fish were sampled and analysed twice a year from each APBs supplied by saltwater. The eradication programme for VHS in Danish marine waters has been completed, and Danish marine waters were declared free from VHS on 20 November 2023.

Information pertaining to the WOAH-listed fish diseases is given in Table 22 on page 48.

BOX 11

National disease control plan for infectious pancreatic necrosis virus and bacterial kidney disease in freshwater aquaculture production businesses (ABPs)

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/or BKD-free by the Danish Veterinary and Food Administration. Denmark has 21 freshwater APBs registered as being IPNV-free and 12 freshwater ABPs as being BKD-free (Executive Order No. 1492 of 12 December 2019 on the Surveillance and Registration of IPN and BKD). Those farms were also recognised by the EU as being free from the diseases in question (Commission Implementing Decision (EU) 2021/260).

Targeted surveillance is conducted at 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 establishments and once a year if they are reared at production establishments. For each inspection, a sample of 30 fish is collected for virological examination for IPNV and another sample of 30 fish for bacteriological examination for BKD.

Animal Health in Denmark 2.8 Fish diseases 49

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 inlet of Limfjorden. The Danish oyster production is mainly based on the utilisation of the natural stock. For more than 15 years, there have been a number of marine aquaculture facilities producing mussels on ropes (lines or nets) on the water column in Denmark. The most recent statistics on the annual mussel production date back to 2022, when the annual production totalled approximately 8,500 tonnes of mussels.

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

Infection with *Bonamia ostreae*

In March 2015, *Bonamia ostreae* was detected in samples collected in November 2014 in the inlet of Limfjorden. That was the first time the disease was ever reported in Denmark. Since the detection in 2015, the presence of the disease has been confirmed every year. In 2023, *B. ostreae* was identified in samples collected from the inlet of Limfjorden. The Danish Veterinary and Food Administration considers it unlikely that the inlet of Limfjorden will regain the status of disease-free.

Table 23: Occurrence of WOAH-listed mollusc diseases in Denmark

Disease	Latest occurrence
Infection with abalone herpesvirus[1,2]	Never reported
Infection with *Bonamia exitiosa*[2]	Never reported
Infection with *Bonamia ostreae*	Disease present
Infection with *Marteilia refringens*	Never reported
Infection with *Perkinsus marinus*	Never reported
Infection with *Perkinsus olseni*	Never reported
Infection with *Xenohaliotis californiensis*[1,2]	Never reported

[1] The disease is not notifiable in Denmark.
[2] Host is not present in Denmark.

3. Animal by-products

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

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

ABPs are categorised, collected, transported, processed, used, stored and disposed of in accordance with EU legislation.[1]

The rules are in place to prevent and minimise risks to public and animal health arising from ABPs, and in particular to protect the safety of the food and feed chain.

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

- Category 1 includes carcasses and parts of 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 carcasses and 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.

The ABP categorisation is static, and the category of a product cannot be changed to a higher one regardless of any processing or treatment. If products from different categories are mixed, the final product is categorised by the lowest category (with the biggest risk). The total average annual production of ABPs in Denmark from slaughterhouses, cutting plants and fallen stock is 600,000 tonnes.

In Denmark, more than 1,500 plants, establishments, users and operators are registered and/or approved by the Danish Veterinary and Food Administration. They are registered according to their ABP activities. ABPs are used in a huge variety of products. ABPs such as hides, skins, wool, feathers, hair and fur are used in well-known products, whereas other ABPs end up as feed and feed materials for animals, organic fertilisers and soil improvers, biogas, fuel and energy.

The total average annual production of ABPs in Denmark from slaughterhouses, cutting plants and fallen stock is 600,000 tonnes.

[1] 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.

4. Livestock statistics

Table 24: Livestock population. Establishments and animals in Denmark, 2021 - 2023

Animal species		2021	2022	2023
Cattle	**Animals**	1,483,019	1,486,686	1.425,805
	Establishment	15,516	14,888	13,751
Sheep	**Animals**	131,610	129,742	129,437
	Establishment	6,002	5,916	5,542
Goats	**Animals**	18,698	18,255	17,699
	Establishment	3,087	3,102	2,967
Horses	**Animals**	175,000[1]	175,000[1]	23,474
	Establishment	78,000[2]	11,143	17,862
Farmed deer	**Animals**	12,417	12,673	11,837
	Establishment	457	468	431
Pigs	**Animals**	13,626,322	13,265,113	12,432,407
	Establishment	7,663	7,133	6,422
Poultry	**Animals**	29,533,554	33,799,031	29,179,554
	Establishment	1,235	1,158	1,006

[1] Estimate based on registrations in the national horse database.
[2] Source: Statistics Denmark.

Source: The Central Husbandry Register. Since Augsust 2021, it has been possible for all establisments with horses to be become registered in the Central Husbandary Register.

Table 25: Sum of animals imported to Denmark from the EU or from third countries 2021 - 2023

Animal species	2021	2022	2023
Horses[1]	2,986	3,474	4040
Cattle[2]	113	223	280
Pigs[3]	35	2	0
Sheep/goats	694	143	123
Poultry[4]	4,334,373	4,240,546	13,597,806[5]

[1] Horses, asses, mules and hinnies.
[2] Bovine animals.
[3] Pigs include domestic pigs *(Sus scrofa domesticus)*, Central European boar *(Sus scrofa scrofa)* and warthogs *(Phacochoerus spp.)*.
[4] Fowls of the species *Gallus gallus domesticus*, ducks, geese, turkeys and guinea fowls.
[5] The increase in imported poultry in 2023 is due to import of day-old broiler chickens. In 2023, the practice shifted from import of eggs to import of day-old chickens (source: Danish Agriculture & Food Council).

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

Table 26: Sum of animals exported from Denmark to the EU or exported to third countries, 2021 - 2023

Animal species	2021	2022	2023
Horses[1]	3,957	5,537	4,196
Cattle[2]	92,474	66,295	104,718
Pigs	12,685,501	12,814,040	15,264,222
Sheep/goats	450	42	209
Poultry[3]	73,860,831	86,333,230	80,789,793

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

Sources: The Trade Control and Expert System of the European Commission (TRACES) and other sources.

5. Index of diseases

F

G

H

I

J

T

V

W

6. Animal health contacts in Denmark

Danish Veterinary and Food Administration

Dr. Charlotte Vilstrup Castle,
Chief Veterinary Officer
Stationsparken 31-33
DK-2600 Glostrup
Phone: (+45) 72 27 69 00
email@fvst.dk

Dr. Mette Kirkeskov Sie,
Deputy Chief Veterinary Officer
Stationsparken 31-33
DK-2600 Glostrup
Phone: (+45) 72 27 69 00
email@fvst.dk

Danish Veterinary and Food Administration
Stationsparken 31 - 33
DK-2600 Glostrup
Phone: (+45) 72 27 69 00

www.fvst.dk