



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

Animal Health in Denmark 2022

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Preface

It is a pleasure for me to present the 2022 Annual Report on Animal Health in Denmark on behalf of the Danish Veterinary and Food Administration (DVFA).

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

The report also reviews developments in 2022 in the field of animal health in Denmark. The focus is on WOA-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 us.

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



1. Animal health surveillance and contingency planning

Monitoring and control of animal diseases

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

Denmark has a long history of intensive production of animal-source foods 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 quite high, and production has increased over the past decades. Information on livestock statistics is given in Chapter 4 of this report.

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

Such animal disease control programmes are intended to prevent human and animal infections and to protect trade interests and are governed by legislation. The extensive trade in Danish animals and animal products is highly dependent on the health status of Danish livestock. To keep livestock free from diseases, various initiatives are taken to limit the risk of disease introduction into Denmark. One example is that the number of imported cloven-hoofed animals has been kept as low as possible for many years (see Table 26 in Chapter 4). 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 disease. Furthermore, as a member of the EU, Denmark has adopted the harmonised EU legislation on animal health and animal production.



Disease surveillance and control programmes are essential.

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 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 likelihood of the introduction of new livestock diseases into Denmark.
- To curb the spread of disease among susceptible animal populations.

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

Animal disease preparedness

Obligation to notify of suspicions

The EU Animal Health Law (Regulation (EU) 2016/429) and the Danish Animal Health Act (Animal Health (Consolidation) Act No. 9 of 6 January 2022) provide the legal basis for the requirements to give notification of suspicions and confirmations of notifiable animal diseases to the competent authority and to list notifiable animal diseases in Denmark. Furthermore, the EU Animal Health Law and the Danish Animal Health Act provide legal powers to perform tasks such as carrying out diagnostic and epidemiological



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

investigations, imposing movement restrictions, establishing restriction zones, performing movement control within such zones, sampling, culling infected, suspected and contact animals, compensating farmers, disposing of carcasses and potentially infectious materials, carrying out cleaning and disinfection and, if necessary, carrying out emergency vaccination.

Notifiable animal diseases in Denmark according to the EU Animal Health Law as well as animal diseases of interest to Danish society are listed in Executive Order No. 1191 of 24 August 2022.

The Executive Order has two lists: List 1 includes diseases which must be notified to the DVFA immediately if there is a suspicion, and List 2 includes diseases which must be notified to the DVFA at the time of confirmation. All animal diseases listed in the EU Animal Health Law are included in List 1. 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, all farmers are obliged to notify a veterinarian in case they have a suspicion of a notifiable disease and in case there are abnormal mortalities or other signs of a severe disease. If the veterinarian has reason to suspect the presence of a notifiable disease included in List 1, the veterinarian must notify the relevant Veterinary Inspection

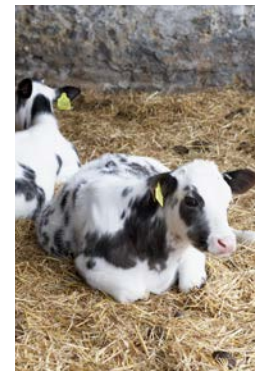
Unit (VIU) of the DVFA of the suspicion. A veterinary officer from the VIU will inspect the herd or flock within five hours and report the suspected case to the Animal Health Division of the DVFA. If the veterinary officer cannot reject the suspicion of a List 1 notifiable disease, official restrictions are imposed on the herd or flock, and test material is collected and dispatched to the national reference laboratory.

As a second line of defence, official veterinarians are responsible for inspecting animals intended for production, slaughter or export at assembly centres and animals intended for export directly from the farm. Furthermore, official veterinarians are responsible for controlling animal welfare at shows if more than one animal species are present. 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 in this chapter.

Handling of suspicions of notifiable animal diseases

The DVFA ensures that all suspicions of a notifiable disease are handled in a uniform way. This is achieved for example by the application of 'action cards'. The action cards, which are available on the DVFA intranet, list all actions necessary to handle a suspicion of a notifiable animal disease.



Effective surveillance for clinical signs of transmissible animal diseases is required for early detection of disease outbreaks.

BOX 1

The role of private veterinarians in national contingency plans

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

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

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

Having signed a VASC, the farmer usually consults the same veterinarian every time. The herd veterinarian may let another veterinarian visit the farm if necessary or if a second opinion of the farm 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. If a farmer suspects a notifiable animal disease, the farmer is obliged to contact the veterinarian immediately. In such a situation, the private veterinarian is obliged to inspect the herd and the animals in question and to evaluate whether further action should be taken. Depending on the suspected disease, the private veterinarian then contacts the relevant Veterinary Inspection Unit (VIU) of the Danish Veterinary and Food Administration (DVFA). A veterinary officer from the VIU will then inspect the herd within five hours and report the suspected case to the DVFA. All suspected cases of a notifiable disease will immediately be registered in a database, and the herds disease status is updated in the central husbandry register. Depending on the nature of the suspected disease, the international animal health organisations



will also be notified. A national database and a web interface have been set up to increase the awareness among farmers and veterinarians of the potential presence of certain notifiable diseases.

A VASC is a means to ensure that the farmer is advised by 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 of notifiable animal diseases.

Transparency in dealing with the suspicion or confirmation of a notifiable animal disease

All suspicions of a notifiable disease will immediately be announced on the DVFA's official website, which displays information (in Danish) on each individual suspicion notified. This is done to increase the awareness among farmers and veterinarians of the potential risk of infection with the relevant notifiable disease.

If a suspected case is deemed to be of potential interest to the general public and/or export markets, a website notice will be followed up by a press release. Additionally, targeted information will be sent to the embassies of Denmark's main export markets.

Compensation for losses caused by outbreaks of notifiable animal diseases

The DVFA compensates animal owners who suffer a financial loss due to the outbreak of a notifiable disease. Compensation is paid under the provisions of Executive Order No. 420 on Compensation and Expenditure for the Control and Prevention of Domestic Animal Diseases (in Danish). The compensation scheme contributes significantly as an incentive for animal owners to comply with the obligation to give notification of listed diseases.

In case of an outbreak of a notifiable disease leading to a loss of animals and/or eggs and the destruction of contaminated feed, the DVFA compensates the value of the animals, eggs and feed. The compensation is based on scale values or estimated by a valuation committee. The committee has three members: one appointed by the herd owner, one appointed by the DVFA and one

being an employee of the DVFA. The premises are cleaned and disinfected according to a fixed plan, the cleaning and disinfection being paid by the DVFA. Furthermore, the DVFA reimburses income losses following the culling of all animals receptive of the disease on a property. Compensation based on scale values covers 20% of the income lost due to difficulties 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.

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

The 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 evaluate 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 in this chapter.

BOX 2

Danish strategy to reduce antimicrobial resistance (AMR)

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

From a One Health perspective, 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.

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 (85%) of antimicrobials used in animals in Denmark. Many initiatives to reduce AMR are therefore aimed at the pig sector. In 2010, the Yellow Card Initiative was introduced to reduce the use of antimicrobials in pig production. A 'yellow card' is given when the consumption of antimicrobials in a pig herd exceeds a fixed national threshold. The pig farmer is thereby ordered to make an action plan to reduce the use of antimicrobials 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 produc-



tion, Denmark has achieved, through the Yellow Card Initiative commencing in 2010, a 30.4% reduction in the total use of antimicrobials in pigs from 2009 to 2022. 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



30.4%

The Yellow Card Initiative, which commenced in 2010, led to a 30.4% reduction in the total use of antimicrobials in pigs from 2009 to 2022.

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 goal proved to be too ambitious and was not met by the end of 2022.

The advisory Committee on Veterinary Medicines will therefore provide the DVFA with advice on new initiatives to further lower the use of antimicrobials for pigs.

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

- 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 8 in section 2.1 of this report.
- Cattle, sheep and goat farmers 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 10 in section 2.2 of this report.
- Swine carcasses samples submitted by pig farmers 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 11 in section 2.4 of this report.
- The DVFA offers free testing for Aujeszky's disease, African swine fever, classical swine fever and *Trichinella* spp. in wild boars hunted in Denmark. For more information on the free testing, see section 2.4 of this report.
- In 2014, the DVFA initiated a special surveillance programme for porcine epidemic diarrhoea. 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 Box 12 in section 2.4 of this report.

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 European EN ISO/IEC 17025 standard or a corresponding standard.

National reference laboratories (NRLs)

As required by Regulation (EU) 2017/625 the DVFA has designated Statens Serum Institut (SSI) as the NRL for most diseases and DTU Aqua, the National Institute of Aquatic Resources at the Technical University of Denmark (DTU), as the NRL for diseases in aquatic animals.

Official laboratories (OLs)

In accordance with Regulation (EU) 2017/625, the DVFA has also designated five veterinary diagnostic laboratories as OLs: one university laboratory, three privately owned Danish laboratories and Société Générale de Surveillance (SGS) Analytics Sweden AB (for BSE/TSE surveillance).

Approved veterinary diagnostic laboratories (ALs)

ALs are laboratories approved by the DVFA under national legislation. Currently, three privately owned veterinary laboratories are ALs in Denmark.

As an NRL, the SSI collaborates closely with the OLs and the ALs. The collaboration includes the handling of samples from suspected cases of a notifiable disease, 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. Almost every year, disease outbreaks occur in nearby countries with comparable intensive animal production systems.

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

The general contingency plan and the disease-specific manuals

The Danish contingency plan for certain notifiable animal diseases consists of a general plan and disease-specific manuals. The Danish contingency plan comprises an overall eradication strategy, tools for eradication, the establishment of a crisis organisation, crisis management and communication planning. The disease-specific manuals include operational instructions for those involved in managing the response to an outbreak.

All contingency plans are publicly available at www.fvst.dk (in Danish).

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

Box 3

Qualitative rapid risk assessment to determine the risk of 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 infectious diseases into Denmark.

The DVFA has implemented a structured, systematic, transparent and well-documented qualitative rapid risk assessment (RRA). Those risk assessment reports are used to provide scientific information to decision makers in order to reduce the introduction of diseases into Denmark in case of the outbreak of certain animal diseases in other EU Member States or in certain countries outside the EU. RRAs are prepared in accordance with the guidelines given in the WOAHA 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.

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

An RRA report is written to describe and report on the estimated risk of introduction of diseases into Danish susceptible animal populations. It is intended to help risk managers prepare for possible health risks and to reduce the social and economic consequences of the relevant threat (the pathogen causing the disease).

In short, the aim of an RRA is to provide 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 in neighbouring countries.
- The estimated risk level for the

introduction of a disease into Denmark through different risk pathways already identified.

- The significance of the consequences if a disease gains a stronghold in Denmark and spreads from the first infected population to other sensitive animal populations.

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

All qualitative RRA 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 2022, specific RRA reports were drafted for highly pathogenic avian influenza, West Nile fever virus, sheep pox and African swine fever due to outbreaks in the EU and countries neighbouring the EU.

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

Vaccination policy

The main methods for disease control described in the Danish contingency plans are the quarantining of farms with animals suspected of carrying a notifiable disease, the culling of infected animals, cleaning and disinfection, and the establishment of restriction zones.

In general, preventive vaccination against notifiable diseases is banned. However, the DVFA is authorised under the relevant EU legislation to use emergency vaccination to control any 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, farmers created both dairy and slaughterhouse cooperatives, which were owned by the farmers. All farmers therefore had a common interest in producing high-quality products.

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

Several animal diseases besides tuberculosis and brucellosis have been eradicated in Denmark 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 (NDCC) and the establishment of a Local Disease Control Centre (LDCC).

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

Training

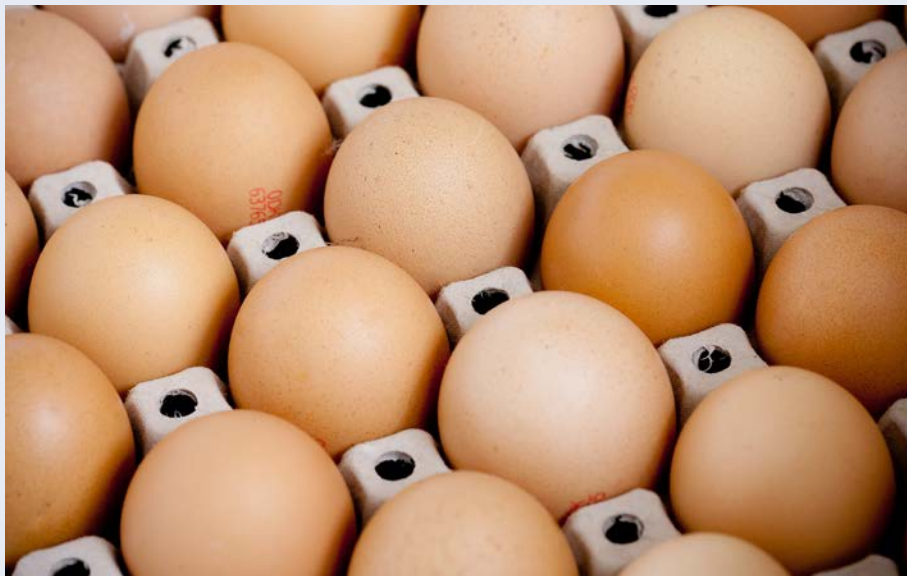
The veterinarians from the DVFA, including veterinarians from the VIUs, organise and prepare practical training as part of the contingency plans.

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 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 for export for that country must comply with all provisions of the bilateral agreement. Regulation (EU) 2017/625 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 national legislation (Executive Order No. 729 and Commission Implementing Regulation (EU) 2020/2235. Certificates can be issued only following a thorough investigation of the background for the certification. Furthermore, the certifying officer must be impartial and independent from commercial interests. According to the rules, the certifying officer must be authorised by the competent authority on the basis of 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 s/he 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 DVFA website.
- Export restrictions imposed as a result of the outbreak will be published on the official DVFA website.
- 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.

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 (EuFMD)).

Simulation exercises

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

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

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

- Procedure exercises: Training in disease-handling procedures.
- Dilemma exercises: Desktop exercises to simulate a specific dilemma or train the use of new software.

- Crisis management exercises: Exercises with a broader scope, such as the assessment of resources, setting up of crisis centres, actions to control outbreaks, communication and collaboration between national or international partners as either local training or full-scale national simulation training involving both regional and national units.
- Evaluation seminars: Each year, the lessons learned from all exercises are evaluated. The learning obtained is used for updating contingency plans and internal procedures and is incorporated into the exercises the following year to create a multiplier effect.

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

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

BOX 5

Disposal analysis

The Danish Veterinary and Food Administration (DVFA) has made an analysis of the capacity available for the disposal of culled animals in case of larger outbreaks of animal diseases, culling being one of the control measures. The analysis included the capacity for the transportation and disposal of carcasses of production animals and horses, but did not include the capacity for the disposal of manure, milk, feed and other pets. Furthermore, it was assumed in the analysis that the culling capacity is sufficient.

The analysis was based on different disease scenarios and the estimated need for disposal in each scenario. Disease scenarios included are highly pathogenic avian influenza, African horse sickness, epizootic haematopoietic necrosis, foot and mouth disease and 'disease X'. To this end, disease X was defined as a new zoonotic infectious disease affecting pigs.

The overall findings of the analysis are reassuring. In most of the disease scenarios, the capacity for transportation and disposal is sufficient. However, the

capacity might become challenged and be insufficient in case of certain major outbreaks. The analysis furthermore describes initiatives that will make it possible to meet the estimated demand for transportation and disposal capacity if they are implemented.

The main recommendations are:

- To increase transportation capacity, for example through framework agreements with haulage contractors.
- To increase disposal capacity, for example by including co-incineration plants by means of framework agreements.
- To prepare for burials by designating areas for burial grounds in advance, including performing relevant environmental evaluations beforehand.

The findings of the analysis will be used in the current task of updating national contingency plans, which will be conducted over the next two to three years.



2. Livestock disease status

In general, a large number of WOA-listed diseases are currently not present in Danish livestock, and only a limited number of outbreaks are recorded in livestock.

Denmark is officially recognised by the WOA as a country free from foot and mouth disease without vaccination, and Denmark also has the official status of a country free from classical swine fever, peste de petit ruminant and African horse sickness. Since 2011, Denmark has been recognised as a country with a negligible risk of bovine spongiform encephalopathy (BSE) by the WOA. Comprehensive BSE testing has been conducted for more than two decades, and the last case of BSE in Denmark occurred in 2009 in a 14-year-old cow. No BSE cases have been recorded after the most recent tightening of the feed ban in January 2001.

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

As regards poultry and other captive birds, Denmark and the rest of Europe experienced a high prevalence of highly pathogenic avian influenza (HPAI) in 2022.

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

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





2.1 Multiple species diseases

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

Aujeszky's disease

According to Commission Implementing Regulation (EU) 2021/620 Denmark is recognised as officially free from Aujeszky's disease by the European Commission. The last case of the disease occurred in Denmark in 1991.

Under the Danish Aujeszky's disease surveillance programme, blood samples from 2% of all sows with a weight of more than 140kg 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 2020-2021 is given in Table 1. Due to trade fluctuations, the number of samples tested varied during the three-year period.

Two suspected cases of Aujeszky's disease were notified to the Danish Veterinary and Food Administration (DVFA) in 2022. Both cases were notified because animals had tested positive in a serological test performed prior to export. Official restrictions were imposed on the herds under suspicion while confirmatory laboratory testing was conducted at the NRL. The suspected cases tested negative for Aujeszky's disease.

Table 1: Blood samples examined under the Danish Aujeszky's disease surveillance programme, 2020-2021

Year	Samples
2020	45,039
2021	37,600
2022	35,289

Source: Statens Serum Institut (SSI) and other official laboratories in the EU, 2022

Bluetongue

Since 1 January 2011, Denmark has been recognised as free from bluetongue according 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 virus serotype 8 (BTV-8) in herds of sheep and cattle. The last outbreak of bluetongue (BTV-8) in Denmark occurred in November 2008.

In 2008, a vaccination campaign against BTV-8 was initiated both in Denmark and in several other EU Member States to control outbreaks of the disease. However, vaccination against bluetongue has been banned 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 blood samples collected from 10 animals from 60 different cattle herds in 2022. In total, 600 blood samples were tested. All tested negative for bluetongue.

Vector surveillance activities have been carried out in Denmark since the first outbreak of bluetongue. For further details on vector surveillance, see Box 7 in this section.

The DVFA was notified of two suspected cases of bluetongue in 2022, all in cows. Both cases were reported due to clinical symptoms. One of the cases was rejected by a Veterinary Inspection Unit (VIU) of the DVFA based on an evaluation of the clinical symptoms. Official restrictions were imposed on the herd under suspicion while laboratory testing was



conducted. The virological tests of samples proved negative.

Brucellosis

Denmark has been recognised as officially free from brucellosis in bovine herds since 1979 (Commission Implementing Regulation (EU) 2021/620). The official Danish eradication programme for brucellosis in bovine herds was initiated in 1948, and all cattle herds were identified as free from brucellosis in 1959. Brucellosis has not occurred in cattle in Denmark since 1962. All bulls at semen collection centres are regularly tested in accordance with the provisions of Commission Delegated Regulation (EU) 2020/686. Cattle intended for export to certain countries outside the EU are also tested. In 2022, 45 aborted foetuses from cattle underwent laboratory testing for brucellosis. All tested negative. See Box

Vector surveillance activities have been carried out in Denmark since the first outbreak of bluetongue.

Table 2: Blood samples examined under the Danish brucellosis surveillance programme, 2020-2022

Year	Cattle: Blood samples	Pigs: Blood samples	Sheep and goats: Blood samples
2020	1,177	43,024	1,807
2021	2,119	27,151	1,703
2022	582	23,144	2,128

Source: Statens Serum Institut (SSI), the Technical University of Denmark and other official laboratories in the EU, 2022.

10 in section 2.2 for more information on the supplementary surveillance for brucellosis in cattle.

The latest case of brucellosis in pigs was in 1999, when *Brucella suis* biovar 2 was diagnosed in a herd of free-range pigs. The source of the infection was never found, but it is suspected that *B. suis* biovar 2 had been transmitted from European brown hares in the area. *B. suis* biovar 2 has not been detected in hares since 2002, when it was diagnosed in two wild hares found dead. All boars at semen collection centres are regularly tested in accordance with the provisions of Commission Delegated Regulation (EU) 2020/686. Breeding pigs intended for export to certain countries outside the EU are also tested for brucellosis. Due to trade fluctuations, the number of samples tested varied during the three-year period mentioned in Table 2.

Brucella melitensis has never been reported in Denmark, and Denmark has been recognised as being officially free from *B. melitensis* since 1995 by the EU according to Commission Implementing Regulation (EU) 2021/620. A serological surveillance programme for *B. melitensis* in sheep and goats is carried out by testing blood samples collected

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

In 2022, no suspected cases of brucellosis were notified to the DVFA.

The number of blood samples examined for brucellosis in the period 2020-2021 is given in Table 2.

Foot and mouth disease

Denmark is recognised by the WOAHP 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 of this report.

In 2022, there were no suspicions of FMD in Denmark.

Infection with *Mycobacterium tuberculosis* complex

Denmark has been recognised as officially free from tuberculosis in bovine herds since 1980 according to Commission Implementing Regulation (EU) 2021/620.

The eradication of infections with *Mycobacterium tuberculosis* complex (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 last outbreak of tuberculosis in cattle occurred in 1988, the infection being of human origin. However, MTBC was also diagnosed in farmed deer in 1988. A surveillance programme for MTBC comprising all Danish herds of farmed deer was initiated in 1989. The last outbreak of tuberculosis in Danish farmed deer occurred in 1994.

The Danish surveillance programme demonstrating the absence of tuberculosis in cattle comprises post-mortem examination of all slaughtered animals

A surveillance programme for MTBC comprising all Danish herds of farmed deer was initiated in 1989.



as part of the meat inspection programme at the slaughterhouses. In 2022, approximately 449,000 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 if required by the third country. In 2022, all tests performed at semen collection centres and in connection with the exportation of animals were negative for MTBC.

Rabies

Since 2021, Denmark has been recognised as officially free from infection with rabies virus according to Commission Implementing Regulation (EU) 2021/620.

Rabies virus (classical rabies virus) has not been reported in domestic animals in Denmark since 1982. In wild animals, the last occurrence was in 1981. Bat rabies (the European bat lyssavirus (EBLV)) was diagnosed for the first time in Denmark in 1985. The occurrence of bat rabies has been monitored since then. The last case of bat rabies in Danish domestic animals was diagnosed in sheep in 2002 (EBLV-1), and the last cases of bat rabies in Danish bats were diagnosed in 2009 (EBLV-1) and 2015 (EBLV-2).

The monitoring of rabies is based on the testing of animals suspected of being infected with rabies and of bats having been in contact with other animals or humans as well as on active surveillance for rabies in bats. In 2022, 11 bats, one fox, eight cats and two dogs suspected of being infected with rabies virus were tested, and all tested negative.

BOX 6 The war in Ukraine and pets

As a result of the Russian invasion of Ukraine in February 2022, the EU, including Denmark, decided to use a derogation in Regulation (EU) No. 2013/576 to allow Ukrainian refugees to bring their pets to the EU when they leave Ukraine in a hurry. Consequently, more than 1,200 pets, mainly dogs and cats, came to Denmark from Ukraine. Following an extensive information campaign targeted at Ukrainian refugees, the pets were registered, isolated and controlled by the DVFA to minimise the risk of introducing rabies. No cases of rabies have been recorded in Denmark at the time of writing.





Trichinellosis

Infections with *Trichinella* spp. have not been reported in domestic animals in Denmark since 1930. For more than 90 years, targeted tests have been performed in Denmark without finding any *Trichinella* spp. in pork or horse meat. In 2007, Denmark was classified in the EU as a region with a negligible risk of trichinellosis in herds of domestic pigs (Commission Regulation (EC) No. 2075/2005). Although the designations of status and categories were changed in 2014 due to an amendment to

the EU legislation (Commission Regulation (EC) No. 216/2014), Denmark was allowed to maintain its surveillance programme for infections with *Trichinella* spp.

The Danish surveillance programme for demonstrating the absence of *Trichinella* spp. infections distinguishes between pigs kept indoors and pigs having access to outdoor facilities, the latter being considered a high-risk subpopulation. Older pigs, such as breeding animals, are also considered a

For more than 90 years, targeted tests have been performed in Denmark without finding any *Trichinella* spp. in pork or horse meat.

BOX 7

Surveillance for disease vectors in Denmark in 2022

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. In the following years, the vector surveillance programme was expanded to include mosquitoes and ticks.

Since 2012, the Danish Veterinary and Food Administration (DVFA) and the Technical University of Denmark (in 2019 replaced by the University of Copenhagen) have carried out systematic surveillance of mosquitoes and biting midge abundance during the warm season. Vectors are collected on a weekly basis through the use of octenol and CO₂-baited suction traps in private gardens and light traps at cattle farms. 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 2021 was characterised by average weather conditions resulting in an average number of all five mosquito genera present in Denmark. The man biting West Nile vector *Culex modestus* continued to be present in high numbers after having recovered in 2021 from the cold July of 2020. In addition, the abundance of *Culicoides* was in line with the average for 2021. The abundance of ticks continues to appear stable between years, although tick-borne encephalitis (TBE virus) is now emerging and continues to spread geographically, especially on northern Zealand. On the northern coast of the island, a transmission hotspot has been identified after human cases were reported. In the small hotspot, up to 10% of *I. ricinus* nymphs test positive for TBE virus. The hotspot has been continuously monitored since 2019 and remains geographically well-defined. It hardly changed in 2022.

Culex modestus mosquitoes (372 in total) collected under the surveillance programme all tested negative for West Nile virus (WNV) and Usutu virus.

The incidence of African swine fever continues to spread closer to the Danish borders. In order to prepare for a potential introduction of the disease into Denmark, the Danish vector surveillance team conducted a series of experimental trials on pig farms in the ASF-affected countries Lithuania and Rumania. Seasonal surveys in both countries have revealed that farmed pigs are frequently bitten by several species of mosquitoes, horseflies and biting flies, some of which are known from laboratory tests to be mechanical vectors of African swine fever virus. Importantly, these experimental trials also identified a large number of blood-feeding insects in both countries, which arrived at pig farms carrying blood meals taken from birds and various species of domestic and wild mammals, including wild boars, up to two kilometres away. This highlights the risk of introduction of pathogens by blood-fed insect vectors into pig farms otherwise well protected by biosecurity measures aimed at farm employees, visitors, trucks, machineries, feed and water, while not necessarily preventing the entry of recently blood-fed insects.

No exotic vector species were found in Denmark 2022.

high-risk subpopulation. However, sows and boars are still exempt from testing when kept under controlled housing conditions, as are also slaughtered fattening pigs reared under controlled conditions in integrated production systems.

Although comprehensive testing for *Trichinella* spp. is not required, the Danish pork meat industry has maintained a practice of testing all slaughtered fattening pigs, boars and sows as not all trading partners accept the above testing regime. Therefore, supplementary testing is performed, and this scheme is still under the control of the Danish competent authorities. All animals of susceptible species slaughtered at Danish slaughterhouses are examined in accordance with the methods prescribed in Commission Implementing Regulation (EC) 2015/1375.

The number of animals from each category of slaughtered animals examined under the Danish trichinellosis surveillance programme in the period 2020-2022 is shown in Table 3.

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



Although comprehensive testing for *Trichinella* spp. is not required, the Danish pork meat industry has maintained a practice of testing all slaughtered fattening pigs, boars and sows.

Table 3: Animals examined under the Danish trichinellosis surveillance programme, 2020-2022

Year	Pigs (incl. boars and sows)	Farmed wild boars*	Horses
2020	17,312,459	637	918
2021	18,508,082	569	761
2022	17,119,391	403	487

* Privately hunted wild boars are included.

Source: Danish Veterinary and Food Administration Laboratory Division and other laboratories accredited to test for *Trichinella* spp., 2022.

BOX 8

Active surveillance for West Nile virus in Denmark in 2022

During the past few years, an increasing number of European countries have reported outbreaks of infection with West Nile virus (WNV), and in 2022, outbreaks of WNV in horses and birds were continuously detected in Central and Northern Europe not far from Denmark. As WNV spread further north with migratory birds from endemic areas, surveillance activities are highly relevant to identify whether the infection has reached Danish territories.

In 2022, the Danish Veterinary and Food Administration (DVFA), Statens Serum Institut (SSI), 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 antibody positive. A total of 243 birds were tested, 12% of which were WNV-antibody positive. In 2021 and previous years, the prevalence was below 5%, which suggests that a higher proportion of migratory birds in Denmark had been exposed to WNV in

2022, probably during their annual winter stay in Africa. By contrast, 56 native wild birds found dead outdoors all tested WNV-antibody negative. All the dead birds were of species which are particularly sensitive to WNV.

Approximately 100 outdoor laying hens were tested and all of them tested WNV-antibody negative. Likewise, did all 18 bats found dead test WNV-antibody-negative. Further, 372 mosquitoes collected under the insect vector surveillance programme (see Box 7) were tested for WNV, and all tested WNV-antibody negative.

In conclusion, due to the increasing number of WNV-antibody positive migrating birds, it is assumed that the risk of introduction of WNV to native bird species and mosquitoes has increased. However, data from the 2022 surveillance programme indicate that it is yet unlikely that infections will become established in the native bird and mosquito populations.

All samples were also tested for Usutu virus (USUV) and corresponding antibodies. All tests were negative.

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A total of 243 birds were tested, 12% of which were WNV-antibody positive.



Table 4: Last occurrence of WOAH-listed multiple species diseases in Denmark

Anthrax	1988
Crimean Congo haemorrhagic fever¹	Never reported
Equine encephalomyelitis (Eastern)	Never reported
Heartwater¹	Never reported
Infection with Aujeszky's disease virus	1991
Infection with bluetongue virus	2008
Infection with <i>Brucella abortus</i>, <i>Brucella melitensis</i> and <i>Brucella suis</i>	Cattle: 1962 Pigs: 1999 Sheep and goats: Never reported
Infection with <i>Echinococcus granulosus</i>	Not reported ²
Infection with <i>Echinococcus multilocularis</i>	2018 ³
Infection with epizootic haemorrhagic disease virus	Never reported
Infection with foot and mouth disease virus	1983
Infection with <i>Mycobacterium tuberculosis</i> complex	1994
Infection with rabies virus	1982 ⁴
Infection with Rift Valley fever virus	Never reported
Infection with rinderpest virus	1782
Infection with <i>Trichinella</i> spp.	1930
Japanese encephalitis	Never reported
New World screwworm (<i>Cochliomyia hominivorax</i>)¹	Never reported
Old World screwworm (<i>Chrysomya bezziana</i>)¹	Never reported
Paratuberculosis	Disease present ⁵
Q fever	Disease present
Surra (<i>Trypanosoma evansi</i>)	Never reported
Tularemia	Disease present ⁶
West Nile fever	Never reported

¹ The disease is not notifiable in Denmark.

² Year of last outbreak not known.

³ Detected in wildlife (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).

BOX 9

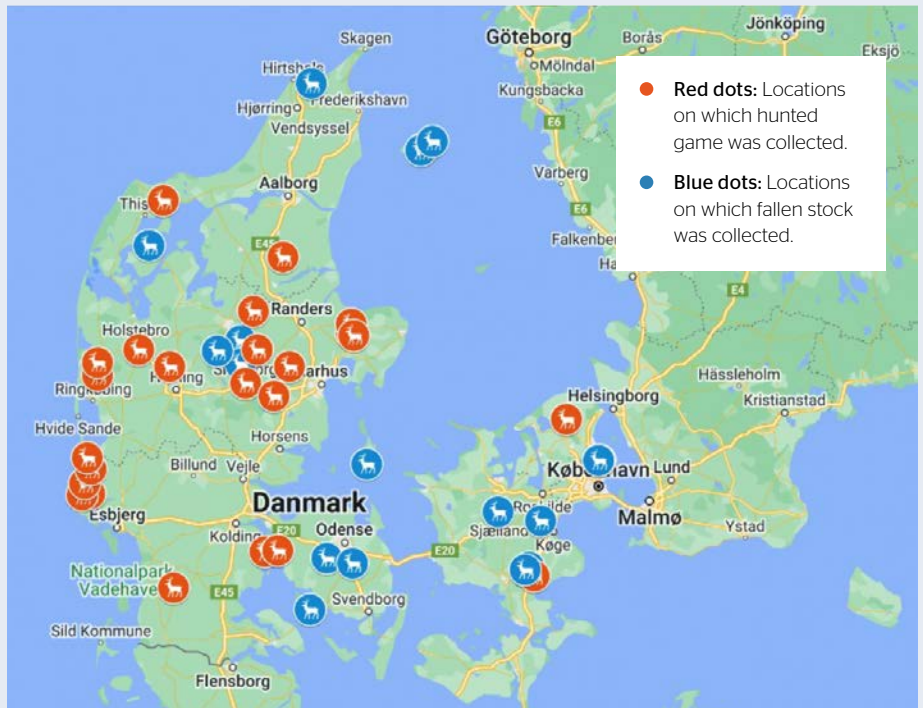
Screening for chronic wasting disease in 2022

Chronic wasting disease (CWD) is a progressive prion disease that affects deer, elk, moose and other cervids. CWD is highly contagious and spreads through direct contact with an infected animal or through environmental contamination such as faeces, urine and spit.

A screening for CWD was carried out in the last quarter of 2022. The screening included both fallen stock and hunted game of the species red deer (57.5%), fallow deer (29.2%), roe deer (8.8%) and sika deer (4.5%).

Tissue samples from the brainstem and a lymph node from the neck region were collected from each animal and submitted to the national reference laboratory in Norway (Norwegian Veterinary Institute) for analysis. In total, samples from 353 animals were analysed, and all samples tested negative.

Figure 1: Map of collection of animals tested for chronic wasting disease.



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



2.2 Cattle diseases

Denmark has a cattle population of approximately 1,480,000 animals. In terms of farms, there are 80% beef farms and 20% dairy farms. The trend towards fewer but larger dairy herds has been evident for many years. In 2022, Denmark had approximately 550,000 lactating cows¹.

Bovine spongiform encephalopathy (BSE) has not been detected in Denmark since 2009, and Denmark is recognised by the WOAAH 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 WOAAH-listed cattle diseases is given in Table 9.

Bovine spongiform encephalopathy

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 bovine spongiform encephalopathy (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 WOAAH 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 most recent tightening of the feed ban was in January 2001, when processed animal proteins were banned in feed for production animals.
- No BSE cases in cattle born after the most recent tightening of the feed ban in January 2001.
- The comprehensive Danish BSE testing programme with a little over 2.7 million tests performed since the beginning of 2001. The long period of more than 20 years since the birth of the youngest Danish case of BSE.

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

¹ Statistics Denmark www.dst.dk

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 2022, no cases suspected due to clinical symptoms of BSE were notified to the DVFA.

Surveillance for bovine spongiform encephalopathy

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

As BSE is a notifiable disease, anyone noticing symptoms of BSE in an animal must notify a veterinary practitioner and, hence, the Danish Veterinary and Food Administration (DVFA). BSE is suspected in animals showing clinical signs compatible with BSE or in case of a positive or inconclusive result of a rapid test performed under the surveillance programme. Confirmatory testing of material from the relevant animal is performed at the national

reference laboratory. Meanwhile, the herd of origin is placed under movement restrictions, at least until the birth cohort of the suspected animal has been identified. Animals of the birth cohort are then placed under movement restrictions. 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 (SRM) 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 SRM (one carcass upstream - two carcasses downstream) if the final result is positive.

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

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

The results of the Danish BSE surveillance programme in the period 2020-2022 are shown in Table 6.

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

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

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

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

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

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

- All clinical suspects (no age limit).
- All fallen stock older than 48 months, emergency-slaughtered animals older than 48 months and animals older than 48 months in which observations 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.

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

The results of the Danish BSE surveillance programme in the period 2020-2022 are shown in Table 6.

Table 6: Results of the Danish BSE surveillance programme, 2020-2022

Category	2020		2021		2022	
	Animals tested	Positive animals	Animals tested	Positive animals	Animals tested	Positive animals
Fallen stock	22,450	0	21,534	0	22,868	0
Emergency-slaughtered animals	1,756	0	1,336	0	1,607	0
AM animals	0	0	0	0	0	0
Healthy slaughter animals	0	0	0	0	1	0
Clinical suspects	0	0	0	0	0	0
Total	24,206	0	22,870	0	24,476	0

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

Bovine virus diarrhoea

Denmark was recognised as free from bovine virus diarrhoea (BVD) in Commission Implementing Regulation (EU) 2022/1218 of 14 July 2022.

No cattle herds were infected with BVD in Denmark in 2022.

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 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 herds except for a few were considered free from BVD. Movement restrictions were imposed on the remaining infected herds, and since 2006, BVD has only occurred sporadically. The last two infected herds were detected in 2019. They were considered as 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 herds four times a year. Cattle from beef herds are sampled at slaughterhouses following a computer-based selection of herds for sampling. Furthermore, bulls at semen collection centres are regularly tested according to the test regime required by the provisions of Commission Delegated Regulation (EU) 2020/686.



In 2022, 10 suspected cases of BVD were notified to the DVFA due to positive serological tests. Official restrictions were imposed on all herds under suspicion while confirmatory laboratory testing was conducted at the national reference laboratory. All suspected herds tested free from BVD in the confirmatory laboratory test.

Denmark was recognised as free from BVD in 2022.

The number of bulk milk samples and the number of blood samples from beef herds examined for BVD in the period 2012-2022 are given in Table 7.

Enzootic bovine leukosis

Enzootic bovine leukosis (EBL) has not occurred in Denmark since 1990, and Denmark was declared officially free from EBL in 1991 (Commission 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 2022, approximately 449,000 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 2022, 552 animals were tested at semen collecting centres and in connection with animal export. They all tested negative.

In 2022, the DVFA was notified of one suspected case of EBL at a slaughterhouse. Official restrictions were imposed while laboratory testing was conducted at the national reference laboratory. The suspected case tested negative.

Infectious bovine rhinotracheitis/ infectious pustular vulvovaginitis

Denmark was recognised as free from infectious bovine rhinotracheitis (IBR) in 1992 (Commission Implementing Regulation (EU) 2021/620).

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

In April 1984, a national serological surveillance programme intended to demonstrate the ab-

Table 7: Bulk milk samples and blood samples examined under the Danish bovine virus diarrhoea surveillance programme, 2020-2022

Year	Bulk milk samples	Blood samples from beef herds
2020	12,293	20,174
2021	10,867	19,547
2022	10,491 ¹	18,898

¹ Samples were taken from 2,419 dairy herds in 2022.

Source: SEGES Innovation, 2023.

Table 8: Bulk milk samples and blood samples examined under the Danish infectious bovine rhinotracheitis surveillance programme, 2020-2022

Year	Bulk milk samples	Blood samples from beef herds
2020	2,783	11,681
2021	2,639	11,196
2022	2,467 ¹	10,902

¹ Samples were taken from 2,369 dairy herds in 2022.

Source: SEGES Innovation, 2023.

Table 9: Last occurrence of WOA-listed cattle diseases in Denmark

Bovine anaplasmosis¹	Never reported
Bovine babesiosis¹	Suspected, but not confirmed
Bovine genital campylobacteriosis	1995
Bovine spongiform encephalopathy	2009
Bovine virus diarrhoea	2019
Enzootic bovine leukosis	1990
Haemorrhagic septicaemia¹	Never reported
Infection with lumpy skin disease virus	Never reported
Infection with <i>Mycoplasma mycoides</i> subsp. <i>mycoides</i> SC (contagious bovine pleuropneumonia)	1886
Infectious bovine rhinotracheitis/infectious pustular vulvovaginitis	2005
Theileriosis¹	Never reported
Trichomonosis	1990
Trypanosomosis	Never reported

¹ The disease is not notifiable in Denmark.

sence of IBR was implemented. The surveillance programme includes testing for IBR antibodies in bulk milk samples from dairy herds and blood samples from beef herds. Bulk milk samples are collected from all dairy herds on a yearly basis. Blood samples from beef cattle herds are sampled at slaughterhouses following a computer-based selection of herds for sampling. Furthermore, bulls at semen collection centres are regularly tested in accordance with the provisions of Commission Delegated Regulation (EU) 2020/686 of 17 December 2019. 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 cattle herds based on the estimated risk of IBR.

In 2022, the DVFA was notified of 11 suspected cases of IBR. All cases were suspected due to positive serological tests. Official restrictions were imposed on all herds under suspicion while laboratory testing was performed. Samples of all suspected cases tested negative for IBR at the national reference laboratory.

The number of bulk milk samples and the number of blood samples from beef herds examined for IBR in the period 2020-2022 are given in Table 8.

BOX 10

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 2022, 45 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 Danish Veterinary and Food Administration (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 examination and microbiological and histological examinations, samples are examined for brucellosis,

Q fever, *Toxoplasma gondii*, *Chlamydia abortus* and *Campylobacter foetus*.

In 2022, 26 aborted foetuses from sheep underwent laboratory testing under this scheme. All tested negative for brucellosis.

No abortion material from goats were received in 2022.

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



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In 2022, 26 aborted foetuses from sheep underwent laboratory testing under this scheme. All tested negative for brucellosis.

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 2022, two cases of Maedi-visna in sheep and two cases of caprine arthritis/encephalitis in goats were confirmed in Denmark. All cases were detected in a voluntary control and surveillance programme for lentivirus.

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

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. Herds included in this programme must be tested every three years to maintain the disease-free status. The disease status of a herd has implications for the sale of live animals from that herd. It is recommended to identify and slaughter animals testing positive as well as their offspring, or to slaughter all animals of the herd if an infection is diagnosed.

In 2022, 576 goats were tested in serological tests, and two tested positive for caprine arthritis/encephalitis antibodies (source: Statens Serum Institut (SSI), 2022).

Maedi-visna

The disease is endemic 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 2022, 1962 sheep were tested in serological tests, and two tested positive for Maedi-visna antibodies (source: Statens Serum Institut (SSI), 2022).

Transmissible spongiform encephalopathy

No cases of classical scrapie were reported in Denmark despite the comprehensive Danish surveillance programme for transmissible spongiform encephalopathies (TSE). Since 2002, 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).



A passive surveillance programme was initiated in Denmark in 1988, active surveillance beginning in 2002. From 1995 to 2002, animals were only tested under the voluntary scheme.

The first case of atypical scrapie was diagnosed in Denmark in 2006. In 2022, one case was reported when a 7-year-old goat was diagnosed with atypical scrapie. However, cases of atypical scrapie are anticipated every year as this disease can appear spontaneously in old animals.

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 restrictions are imposed on the herd of origin and/or other herds in which the animal may have been exposed to TSEs.

The Danish TSE surveillance programme implements the European TSE legislation as laid down in Commission Regulation (EC) No. 999/2001. In 2003, Denmark initiated an extended national surveillance programme according to the EU rules at the time. According to the Danish programme, all fallen sheep and goats older than 18 months were tested, and Denmark was therefore granted additional guarantees regarding stringent import rules. In 2012, Denmark revised the national programme to become a testing scheme under which only random samples of sheep and goats older than 18 months were tested. The reason was the substantial number of TSE tests performed during the preceding eight-year period which all tested negative for classical scrapie. The sample size depends on the size of the population and the rules laid down in the TSE Regulation (Council Regulation (EC) No. 999/2001) as amended (Annex III).



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

Table 10: Results of the Danish surveillance programme for TSEs in sheep, 2020-2022

Category	2020		2021		2022	
	Animals tested	Positive animals	Animals tested	Positive animals	Animals tested	Positive animals
Animals not slaughtered for human consumption	509	0	455	0	504	1
Healthy slaughter animals	0	0	0	0	0	0
Cases of clinically suspected TSE	0	0	0	0	0	0
Total	509	0	455	0	504	1

Source: The European Food Safety Authority (EFSA), 2022.

A major amendment to the TSE Regulation concerning imports was made in 2013 in order 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 TSEs in sheep and goats in Denmark in the period 2020-2022 are shown in Tables 10 and 11.

Table 11: Results of the Danish surveillance programme for TSEs in goats, 2020-2022

Category	2020		2021		2022	
	Animals tested	Positive animals	Animals tested	Positive animals	Animals tested	Positive animals
Animals not slaughtered for human consumption	91	0	107	0	103	0
Healthy slaughter animals	0	0	30	0	0	0
Cases of clinically suspected TSE	1	0	0	0	0	0
Total	92	0	137	0	103	0

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

Table 12: Last occurrence of WOAH-listed sheep and goat diseases in Denmark

Caprine arthritis/encephalitis¹	Infection/infestation
Contagious agalactia²	Never reported
Contagious caprine pleuropneumonia	Never reported
Infection with <i>Chlamydophila abortus</i> (Enzootic abortion of ewes, ovine chlamydiosis)²	Never reported
Infection with peste des petits ruminants virus	Never reported
Maedi-visna	Infection/infestation
Nairobi sheep disease³	Never reported
Ovine epididymitis (<i>Brucella ovis</i>)	Never reported
Salmonellosis (<i>Salmonella abortusovis</i>)	Never reported
Scrapie (transmissible spongiform encephalopathy, classical scrapie)	Never reported
Sheep pox and goat pox	1879

¹ Two goats tested positive in serological tests in 2022, but no clinical signs were observed.

² The disease is not notifiable in Denmark.

³ Two sheep from one holding tested positive in a serological test in 2022, but no clinical signs were observed.



2.4 Swine diseases

The Danish pig production is characterised by large intensive farms. Approximately 2800 Danish pig farms are managed according to the SPF-programme. This means that approximately 78% of pigs born in Denmark and 100% of all traded breeding pigs have a SPF-status.

Approximately 90% of Danish pig meat or meat products are exported, and approximately 45% of all piglets are exported as live animals, according to the Danish Agriculture & Food Council.

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

African swine fever (ASF)

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

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

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

In 2022, 368 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 11 for more information on the surveillance programme. In addition, 222 samples from pigs were tested for ASF for example prior to export to certain countries outside the EU. All samples tested negative.

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

If a pig shows clinical symptoms of ASF, CSF is also suspected. The Danish Veterinary and Food Administration (DVFA) was notified of three suspected cases of ASF in 2022. All cases were reported due to clinical symptoms found in animals either in a holding or at a slaughterhouse. Official movement restrictions were imposed on the herds under suspicion while epidemiological investigation and laboratory testing were conducted. However, all samples tested free from ASF and CSF. Further details on the suspected cases are given under the heading of classical swine fever.

Initiatives to prevent the introduction of African swine fever into Denmark

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

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

Veterinary actions:

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

Eradication of wild boars in Denmark:

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

The public is encouraged to take part in the eradication of wild boars by reporting animals found to the DVFA. This can easily be done by using the smartphone app 'VildsvineTip' (in English:



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

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 in the database about animals killed. The relevant Veterinary Inspection Unit (VIU) then collects samples from the dead wild boars (whether shot, road-killed and otherwise deceased) for the purpose of testing them for ASF, CSF and Aujeszky's disease, and the laboratory enters the test results into the database. Hunters are offered free testing of hunter-killed wild boars for *Trichinella* spp., which boosts the surveillance for ASF, CSF and Aujeszky's disease as well. The person reporting the wild boar will also be notified of the test results through the app. Carcasses of dead wild boars are collected and disposed of. All results are publicly available at www.vildsvin.fvst.dk (in Danish). Sightings of wild boars reported in 2022 are illustrated in Figure 2.

The measures to eradicate wild boars in Denmark have resulted in a sharp decline in the number of free-living wild boars. By the end of 2022, no free-living wild boars had been seen in Denmark.

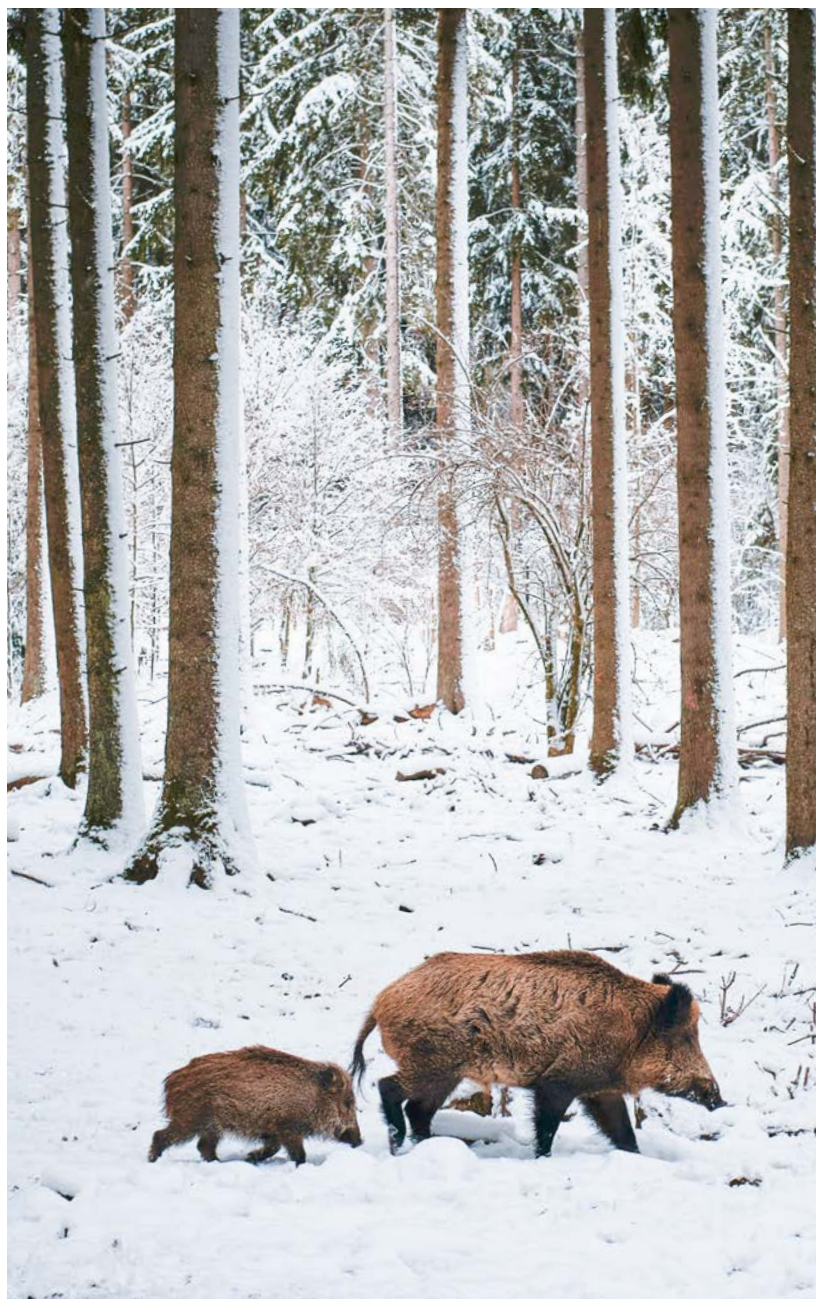
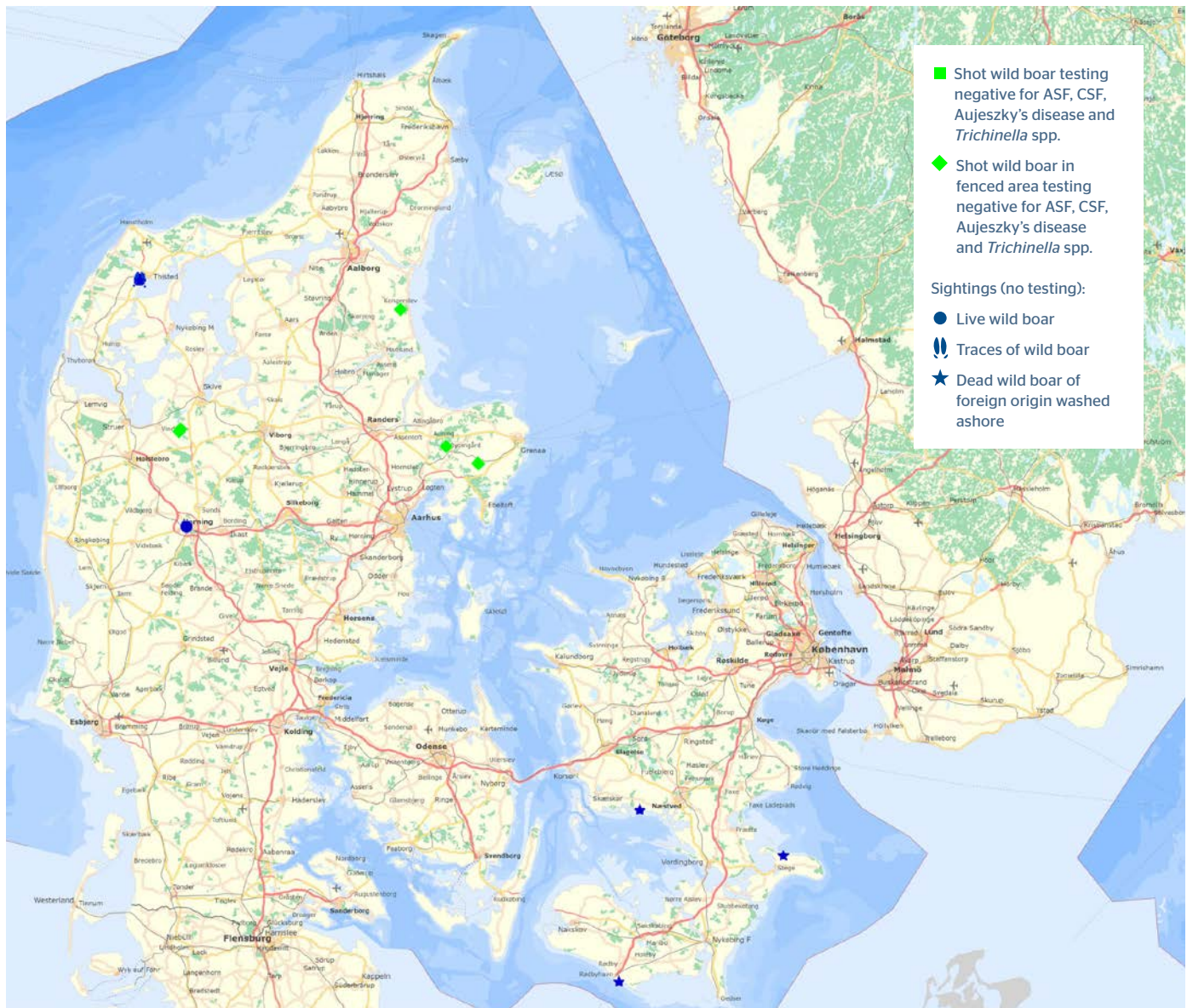


Figure 2
Wild boars registered in 2022.



Classical swine fever

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

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

- Random sampling of a maximum of 2% of sows at slaughter.
- Targeted testing of boars at semen collection centres in accordance with 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 11.

The number of samples examined in the period 2020-2022 is given in Table 13. Due to trade fluctuations, the number of samples tested for CSF varied significantly during the three-year period mentioned in Table 13.

BOX 11 Supplementary surveillance for African swine fever and classical swine fever

Samples from carcasses of swine submitted by pig farmers 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 the anamnesis, and relevant organ material is collected for the testing for ASF and CSF. If a sample tests positive, the result is immediately reported to the Danish Veterinary and Food Administration (DVFA) as a suspected case of ASF or CSF.

On a weekly basis, samples from at least six pig herds are tested for ASF and CSF under this programme. In 2022, samples from 368 submissions were tested; all tested free from ASF and CSF.



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

In 2022, the DVFA was notified of four suspected cases of CSF (in three of those cases, there was a suspicion of both ASF and CSF). Two cases were suspected due to clinical signs in pigs at the ante-mortem inspection at a slaughterhouse and one case due to clinical symptoms in animals of a herd. One case was notified because animals tested positive in a serological test performed prior to export. In all suspected cases, the herd of origin was subjected to thorough clinical examination and laboratory testing. The relevant VIU imposed official restrictions on the herds under suspicion while epidemiological investigation and laboratory testing were conducted. All samples tested free from CSF and ASF.

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



Table 13: Serum samples from pigs examined under the Danish classical swine fever surveillance programme, 2020-2022

Year	Samples
2020	26,090
2021	30,080
2022	32,840

Source: Statens Serum Institut (SSI) and other official laboratories in the EU, 2022.

Table 14: Last occurrence of WOAH-listed swine diseases in Denmark

Infection with African swine fever virus	Never reported
Infection with classical swine fever virus	1933
Infection with porcine reproductive and respiratory syndrome virus (PRRS)	Disease present ¹
Infection with <i>Taenia solium</i> (porcine cysticercosis)	Disease absent ²
Nipah virus encephalitis	Never reported
Transmissible gastroenteritis	Never reported

¹ PRRS is endemic in Denmark.

² Year of last outbreak is not known.

BOX 12

No porcine epidemic diarrhoea virus in Denmark

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

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

From October to December 2014, approximately 2,000 blood samples were tested by 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 herds. In statistical terms, it was concluded with 92% certainty that the prevalence of the PED virus in Denmark was less than 1% at the end of 2014.



In 2015, the pig farming industry took over responsibility for the surveillance scheme. Material from carcasses of piglets with diarrhoea submitted for post-mortem examination is included in the PED surveillance scheme as a supplement to serological surveillance. In 2022, 195 samples were examined as part of the surveillance programme. All samples tested negative for PED.

195

In 2022, 195 samples were examined as part of the surveillance programme. All samples tested negative for PED.



2.5 Poultry diseases

The poultry production in Denmark comprises two major categories: Table egg production and meat production.

Over the past years, there has been an increase in outbreaks of avian influenza, and 2022 was no exception. Only few other poultry diseases listed by the WOAHP were diagnosed in 2022, including Newcastle disease in connection with an outbreak in captive birds.

Avian influenza

Avian influenza (AI) has the potential of causing detrimental losses to the poultry industry if introduced into a holding. AI can be categorized into two types: highly pathogenic avian influenza (HPAI) and low pathogenic avian influenza (LPAI). The most dominant virus subtype of HPAI in 2022 was H5N1. There was only one outbreak of the H5N8 subtype. No outbreaks of LPAI were detected in 2022.

The main source of infection is contact with wild birds. Findings of virus in wild birds during the summer and early months of the autumn of 2022 indicated that virus persisted in the wild bird population in Denmark during that period. Otherwise, there is usually a seasonal fluctuation in the occurrence of AI that is closely linked to the migratory behaviour of wild birds, the incidence increasing in October and peaking in February. In 2022, the

autumn months were a bit warmer than usual, which resulted in birds lingering for longer periods of time in certain resting areas north and east of Denmark before migrating southwards.

A total of 37 suspicions of HPAI were reported to the DVFA in 2022. The first outbreak in 2022 was confirmed on 1 January 2022 in a turkey holding. A total of six outbreaks in poultry were confirmed in 2022, mainly in holdings of fattening turkeys and egg-laying hens. Furthermore, three outbreaks were confirmed in captive birds. The first outbreak of AI in the season of 2022/2023 was confirmed on 28 October 2022 in a holding of captive birds. That was the first outbreak since March 2022. An overview of all outbreaks in poultry in 2022 is shown in Table 15. All outbreaks were reported to the WOAHP through the World Animal Health Information System (WAHIS).

All outbreaks of HPAI in poultry and captive birds were handled in accordance with Commission Delegated Regulation (EU) 2020/687. Restriction zones of 3 km and 10 km were established around each outbreak. Poultry and captive birds on the infected holdings were culled, and the DVFA approved the cleaning and disinfection of the facilities. The 3 km and 10 km restriction zones were lifted, minimum 21 and 30 days respectively after approval of the preliminary cleaning and disinfection and the screening of the holdings in the zones.

The HPAI epidemic continued into 2023 with another outbreak in poultry (laying hens at a poultry farm with 50,000 animals) confirmed on 1 January 2023.

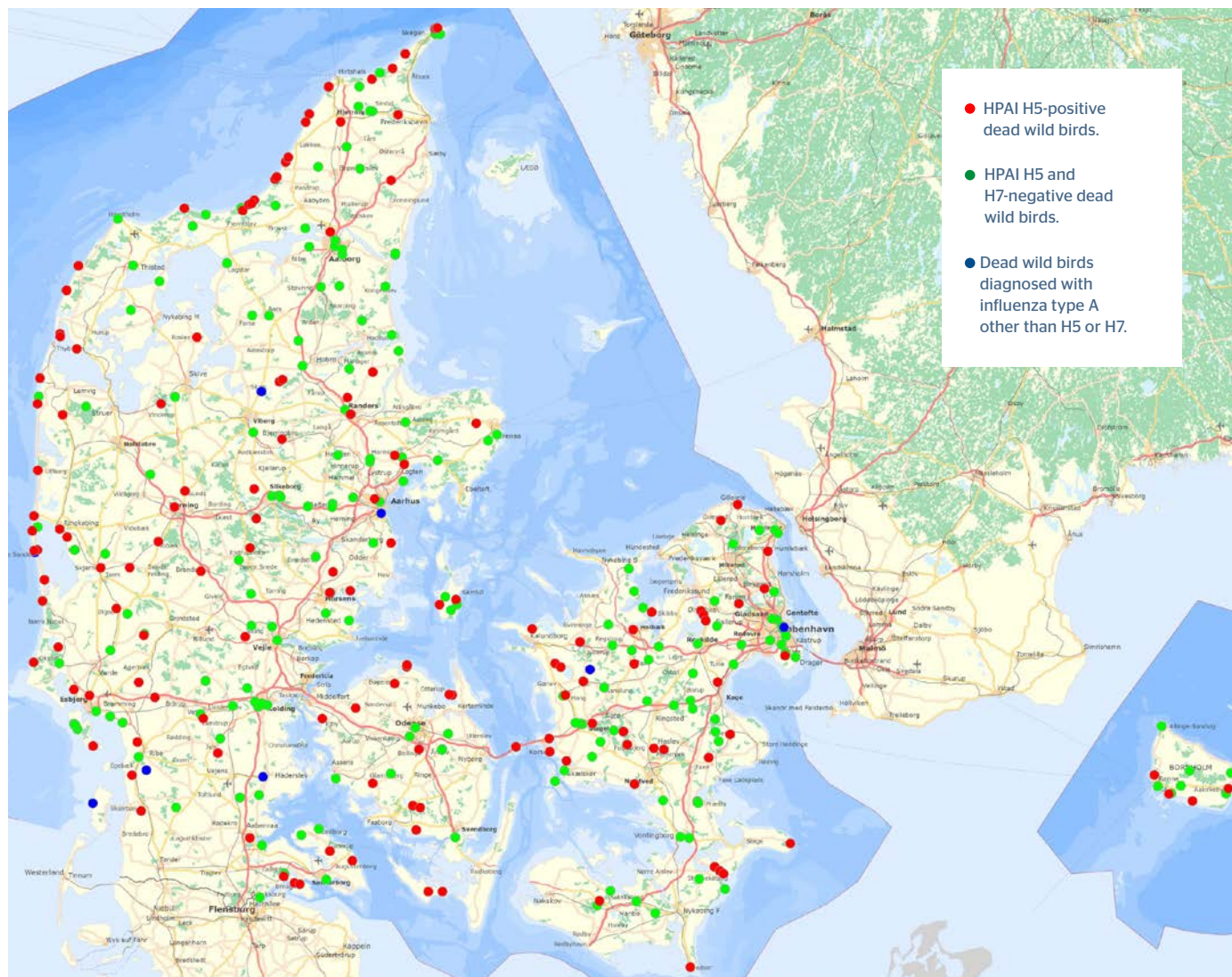


Table 15: Outbreaks of avian influenza in poultry and other captive birds in Denmark, 2022

Outbreak number	Municipality	Confirmed (date)	Virus type	Susceptible birds	Category	Type of holding	Approval of preliminary cleaning and disinfection (date)
1	Lolland	01/01/2022	HPAI H5N1	36,000	Poultry	Fattening turkeys	07/01/2022
2	Sorø	03/01/2022	HPAI H5N1	64,000	Poultry	Fattening turkeys	11/01/2022
3	Viborg	07/01/2022	HPAI H5N8	100,000	Poultry	Laying hens	11/01/2022
4	Sorø	15/01/2022	HPAI H5N1	18	Captive birds	Hens	17/01/2022
5	Holbæk	11/02/2022	HPAI H5N1	800	Poultry	Laying hens	13/02/2022
6	Langeland	29/03/2022	HPAI H5N1	11	Captive birds	Hens	30/03/2022
7	Sønderborg	28/10/2022	HPAI H5N1	76	Captive birds	Hens, ducks and peacocks	30/10/2022
8	Slagelse	09/11/2022	HPAI H5N1	33,600	Poultry	Fattening turkeys	14/11/2022
9	Lolland	22/12/2022	HPAI H5N1	36,000	Poultry	Fattening turkeys	22/12/2022

Figure 3

Dead wild birds tested for avian influenza in 2022.



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

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, and a new updated AI surveillance programme comprising the detection of early warning signs, routine surveillance in specified poultry and sampling strategies came into effect on 1 February 2022. The requirement to give notification of early warning signs of AI applies to all categories of poultry, whereas routine surveillance includes only the sampling at holdings of certain types of poultry (quails and waterfowl, such as ducks and geese species, as well as other game birds).

In Box 13, the early warning signs are described in detail. Based on previous experiences from the years of surveillance of HPAI in all poultry category holdings, including hens and other very susceptible breeds, it was evident that an effective early warn-

ing scheme is sufficient and effective for detecting outbreaks in such flocks. Seven early warnings of AI were notified to the DVFA in 2022 and samples were taken from the relevant flocks. One of the samples tested positive for HPAI H5N1. The other six samples tested free from AI and Newcastle disease (ND).

The new active surveillance programme for AI in poultry is risk-based and mainly targeted at establishments with poultry species that generally do not display significant signs when infected with AI, the purpose being to disclose any silent spreads in flocks of:

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

Table 16: Results of the active Danish surveillance programme for avian influenza in poultry and game birds for restocking in 2022.

	Holdings tested ¹	Positive holdings
Fattening and breeding geese	2	0
Fattening and breeding ducks	14	0
Farmed game birds	17	0
Quails	0	0
Holdings not included in the surveillance programme	36	0
Total	69	0

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.

All holdings in the target group with more than 100 animals are included in the programme. Tracheal and cloacal swap samples are taken from 10 birds from each holding. The samples are analysed virologically using the RT-PCR method. When traded, poultry have to be accompanied by a certificate stating that the flock of origin has tested negative for AI within the preceding three months.

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 2 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 2 months before movement. Testing must be done at Statens Serum Institute (the National Reference Laboratory).

The results of the Danish surveillance programme for AI in poultry and game birds in 2022 are shown in Table 16.

The surveillance programme for avian influenza in wild birds

The avian influenza (AI) virus continued to be prevalent in the wild bird population in 2022. It is believed that the reservoir and natural host for the AI virus are wild birds, especially waterfowl species. The collection and sharing of data and knowledge between Member States are imperative in order to maintain appropriate strategies and measures of biosecurity with the intention of protecting the poultry sector. Due to the fact that AI has the potential of infecting both humans and other mammals, the surveillance of AI remains important.

BOX 13

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

The AI early warning parameters requiring the owner of the animals to notify the 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 notified to the DVFA, and samples are collected from 10 birds of the flock for virological examination (PCR).

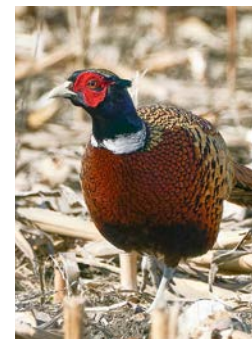
Samples are also tested for Newcastle disease, as this disease is listed as an important differential diagnosis.



The avian influenza (AI) virus continued to be prevalent in the wild bird population in 2022.

Since January 2011, the surveillance programme for AI in wild birds has been divided into an EU-coordinated passive surveillance programme and active national surveillance. As part of the passive surveillance, wild birds found dead are tested for AI 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 'FugleinfluenzaTip' (in English: Bird Flu Tip-off). As part of the active surveillance programme, live birds with an increased risk of exposure to AI and hunted game birds are sampled for virological examination using cloacal and tracheal swabs.

The results of the passive and active surveillance programmes are displayed in table 17. LPAI was detected in one pool sample taken in connection with the active surveillance of LPAI in live wild birds in 2022. In general, HPAI was the most prevalent type detected. The distribution of wild species tested positive for HPAI is shown in table 18.



The DVFA encourages the public to report findings of dead wild birds, which can be done using the smartphone app 'FugleinfluenzaTip'.

Table 17: Results of the Danish surveillance programme for avian influenza in wild birds, 1 January to 31 December 2022

	Passive surveillance (dead or sick wild birds)	Active surveillance (live wild birds)
Birds sampled	433	709
Samples/pools	866	207 pools ¹
Influenza A-positive birds	220	50 pools ²
LPAI H5-positive birds	0	1 pool ²
LPAI H7-positive birds	0	0
HPAI H5-positive birds	206	9 individual birds
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 pool is positive, at least one of the birds making up the pool was positive. When a pool tests positive for HPAI virus, samples from the individual birds contributing to the pool are tested individually.



Table 18: HPAI in dead wild birds by species, 2022

Species	Birds with H5 (unknown N type)	Birds with H5N1	Birds with H5N3	Birds with H5N5	Birds with H5N8	Positive birds per species
Barnacle goose/<i>Branta leucopsis</i>	0	19	0	0	0	19
Canada goose/<i>Branta canadensis</i>	0	2	0	0	0	2
Common kestrel/<i>Falco tinnunculus</i>	0	1	0	0	0	1
Common pheasant/<i>Phasianus</i>	0	7	0	0	0	7
Common raven/<i>Corvus corax</i>	0	1	0	0	0	1
Common teal/<i>Anas crecca</i>	1	0	0	0	0	1
Eurasian buzzard (common buzzard)/<i>Buteo buteo</i>	0	36	0	0	0	36
Eurasian eagle-owl/<i>Bubo bubo</i>	0	2	0	0	0	2
Eurasian wigeon/<i>Anas Penelope</i>	0	4	0	0	0	4
Great cormorant/<i>Phalacrocorax carbo</i>	0	2	0	0	0	2
Grey heron/<i>Ardea cinerea</i>	0	1	0	0	0	1
Greylag goose/<i>Anser anser</i>	0	8	0	0	0	8
Herring gull/<i>Larus argentatus</i>	0	6	0	0	0	6
Mallard/<i>Anas platyrhynchos</i>	0	1	0	0	0	1
Mute swan/<i>Cygnus olor</i>	0	8	0	0	0	8
Northern gannet/<i>Morus bassanus</i>	0	3	0	0	0	23
Peregrine falcon/<i>Falco peregrinus</i>	0	1	0	0	0	3
Pink-footed goose/<i>Anser brachyrhynchus</i>	0	1	0	0	0	1
Rough-legged hawk /<i>Buteo lagopus</i>	0	1	0	0	0	1
Sandwich tern/<i>Thalasseus sandvicensis</i>	0	2	0	0	0	2
Tawny owl/<i>Strix aluco</i>	0	2	0	0	0	2
White-tailed eagle/<i>Haliaeetus albicilla</i>	0	3	0	0	1	3
Whooper swan/<i>Cygnus cygnus</i>	1	7	0	0	1	9
Total positive birds	2	140	0	0	1	143

Source: Statens Serum Institut (SSI) and the University of Copenhagen, 2022.

In November 2022, several outbreaks were confirmed in Germany close to the border to Denmark and in the Netherlands. A large number of migrating birds were expected to reach Denmark in the following weeks, and when looking at the previous AI season of 2021/2022, a rise in the virus detection rate was expected. Therefore, the risk level of infection of captive birds and poultry in Denmark by wild birds was raised from low to moderate. On 21 November 2022, this risk was raised from moderate to high because the incidence in wild birds was increasing and because of an increasing number of HPAI outbreaks in neighbouring countries. The prospect of large numbers of migratory birds coming from countries north and east of Denmark to overwinter was also taken into account.

Strengthened biosecurity measures due to the HPAI epidemic

A compulsory housing order was introduced on 23 November 2022 as a consequence of the increased risk. The housing order required that 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. It applied to the whole country and to all categories of poultry and captive birds. Holdings of captive birds with less than 100 birds were excepted from the housing order if the products of the birds were eaten in the producing household and if there was no direct or indirect contact with poultry. In addition, fairs, markets, shows and other gatherings of poultry or other captive birds were prohibited across the country.



For a period, fairs, markets, shows and other gatherings of poultry or other captive birds were prohibited across the country to strengthen biosecurity.

The DVFA could permit the said activities for holdings of captive birds with less than 100 birds if there was no direct or indirect contact between those holdings and poultry holdings. The compulsory housing order would be lifted again when the risk level was deemed to have been reduced from high to moderate or low based on a risk assessment.

Newcastle disease

Newcastle disease (ND) is caused by an infection with avian paramyxovirus type 1 (PMV-1). It is a disease listed by the WOA. If poultry show clinical symptoms of AI, ND is also suspected, and official restrictions are imposed on the farm while an epidemiological investigation of the flock is carried out and laboratory testing is conducted. In practice, this means that all holdings suspected of an infection with AI due to clinical symptoms or tested under the early warning scheme are tested for both ND and AI.

A prophylactic vaccination programme has been enforced in Denmark and is compulsory for all commercial poultry holdings. 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 1 July 2022, an outbreak of ND was confirmed in two connected holdings in the municipality of Næstved. This was the first outbreak of ND in Denmark since 2005. The outbreak involved approximately 100 carrier pigeons at one site and a



mixture of carrier pigeons, backyard chickens and captive birds (in total approximately 1,000 animals) at another site. All birds were culled, and a 3 km protection zone and a 10 km surveillance zone were established. Official restrictions and precautionary measures in these zones were enforced by the DVFA. The outbreak was not reported to WOA because the outbreak did not align with the definition of ND in Article 10.9.1 of the Terrestrial Animal Health Code (2022), the reason being that the affected population only consisted of captive birds.

A prophylactic vaccination programme for ND has been enforced in Denmark and is compulsory for all commercial poultry holdings.

Table 19: Outbreaks of poultry diseases listed by the WOAAH and notifiable in Denmark, 2020-2022

Poultry disease	2020	2021	2022
Avian chlamydiosis¹	2	25	16
Avian infectious laryngotracheitis	6	8	1
Avian mycoplasmosis (<i>Mycoplasma gallisepticum</i>)	(1967)	(1967)	(1967)
Fowl typhoid	(2002)	(2002)	(2002)
Infection with highly pathogenic avian influenza viruses (poultry)	1	15	6
Infection with highly pathogenic avian influenza A virus (other captive birds)	1	4	3
Infection with low pathogenic avian influenza viruses	1	(2020)	(2020)
Infection with Newcastle disease virus	(2005)	(2005)	1 ²
Pullorum disease	(2019)	(2019)	(2019)

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

¹ Occurrence mainly in ornamental, hobby and backyard birds.

² Outbreak was not notified to the WOAAH because it did not align with the definition of Newcastle disease in the Terrestrial Animal Health Code.

Table 20: Last occurrence of other WOAAH-listed poultry diseases not notifiable in Denmark

Avian infectious bronchitis	Suspected, but not confirmed
Avian mycoplasmosis (<i>Mycoplasma synoviae</i>)	Disease absent ¹
Duck virus hepatitis	Suspected, but not confirmed
Infectious bursal disease (Gumboro disease)	Disease present
Turkey rhinotracheitis	2007

¹ Year of last outbreak is not known.

Source: The Poultry Database of the Danish Agriculture & Food Council, 2022.



Table 21: Occurrence of WOAH-listed equine diseases in Denmark

Contagious equine metritis	Disease present
Dourine	Never reported
Equine encephalomyelitis (Western)	Never reported
Equine infectious anaemia	1928
Equine influenza¹	Suspected, but not confirmed ²
Equine piroplasmosis¹	Disease absent ³
Infection with <i>Burkholderia mallei</i> (glanders)	1928
Infection with African horse sickness virus	Never reported
Infection with equid herpesvirus-1 (EHV-1)¹	Disease absent ³
Infection with equine arteritis virus	Disease absent
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 last outbreak is not known.

2.6 Equine diseases

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

One of the WOAH-listed equine diseases are known to be present in Denmark, namely contagious equine metritis, and several cases were reported in 2020-2022. Equine viral arteritis is notifiable and suspected to be present in Denmark, but the infection has not been confirmed.

Contagious equine metritis (CEM)

Infection with *Taylorella equigenitalis*, which causes contagious equine metritis (CEM), was diagnosed in several horses in Denmark in 2022. Most of the cases were in horses of the Icelandic and Fjord breeds. Samples from those horses were collected for microbiological examination in connection with breeding and following clinical suspicions, and official restrictions were imposed on infected stallions by the DVFA. The restrictions comprised a duty to treat infected stallions and a prohibition against the use of infected stallions for breeding until they had tested negative for *T. equigenitalis*. Further, all mares were traced, and the DVFA recommended the treatment of infected mares and the suspension of breeding activities until the horses had tested negative for *T. equigenitalis*.

Testing for CEM is also carried out in connection with international trade in horses and horse semen.

Dourine

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

Equine infectious anaemia

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

Glanders

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

Information pertaining to equine diseases is given in Table 21.

Information pertaining to equine diseases is given in Table 21.

2.7 Fur animal diseases

For many years, Denmark was among the world's leading producers of animal fur. By midsummer 2020, 1,147 mink farms with a population of approximately 15 million minks were registered in Denmark². During the remainder of 2020, the COVID-19 pandemic had a severe impact on the Danish mink production. All minks at farms were culled in 2020, and a temporary ban on mink farming was imposed in Denmark. The ban was lifted at the end of 2022. From 1 January 2023, mink production can be resumed under strict surveillance and subject to the obligation to adhere to specific infection protection requirements.

Denmark still has a very 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 780 fur animals in 2022. The number is limited, and the animals are ferrets and chinchillas.

Myxomatosis

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

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

Rabbit haemorrhagic disease

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

In 2022, five cases of RHD were confirmed. All cases were at hobby holdings of rabbits in which increased mortality had been observed. The wild population of rabbits in Denmark is considered a reservoir for the disease. Vaccination against RHD is allowed in Denmark.

² Source: **Kopenhagen Fur** (owned by the Danish Fur Breeders' Association).





2.8 Fish diseases

In 2022, 198 aquaculture production businesses (APBs) producing fish were registered in Denmark. The majority were freshwater fish farms, but 20 APBs were marine fish farms producing rainbow trout (*Oncorhynchus mykiss*) in net cages, and 10 APBs produced fish in saltwater tanks/raceways. The marine fish farms are located in the Belt Sea, south and west of Zealand, along the eastern coast of Jutland and near the island of Samsø.

The Danish aquaculture surveillance programme

Since 1970, Denmark has had an official disease surveillance programme comprising all fish farms in the country. Common EU legislation on animal health conditions governing the placing on the market of aquaculture animals was introduced by Regulation (EU) 2016/429. Since then, the 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 notify suspicions of animal diseases and abnormal mortalities, routine inspections and laboratory examination of surveillance samples.

In 2022, the Danish Veterinary and Food Administration (DVFA) carried out 207 inspections of fish farms. The surveillance samples (including export samples) tested in 2022 are described in Table 22.

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 88% of the production of fish at Danish fish farms. Some saltwater and freshwater fish farms produce brown trout (*Salmo trutta*), salmon (*Salmo salar*) and brook trout (*Salvelinus fontinalis*). These 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 fish farms produce other species such as zander (*Sander lucioperca*)

207

In 2022, the DVFA carried out 207 inspections of fish farms.

Table 22: Surveillance samples (including export samples) tested under the Danish aquaculture surveillance programme in 2022

Disease	Type of tissue sampled ¹	Testing method ²	Samples tested in 2022 ³
Infection with Epizootic haematopoietic necrosis virus	1	A	593
Infectious haematopoietic necrosis	1	A+B	738
Infection with infectious salmon anaemia virus	2	B	170
Infection with salmonid alphavirus	1	B	88
Spring viraemia of carp	1	A	7
Viral haemorrhagic septicaemia	1	A+B	709

¹ 1: Kidney, spleen and heart (and in some cases brain).

2: Kidney, heart and gills.

² A: Cultivation in cell culture followed by observation of cytopathic effect.

B: PCR test.

³ Each sample tested is a pooled sample of up to 10 fish per sample.

and turbot (*Scophthalmus maximus*). Those species are also sampled and tested for viral haemorrhagic septicaemia (VHS) virus and/or infectious haematopoietic necrosis (IHN) virus. The types of tissue sampled and the testing methods are also specified in Table 22.

Infectious haematopoietic necrosis

Denmark has 28 fish farms that are declared IHN-free compartments and one compartment with an approved eradication programme for IHN.

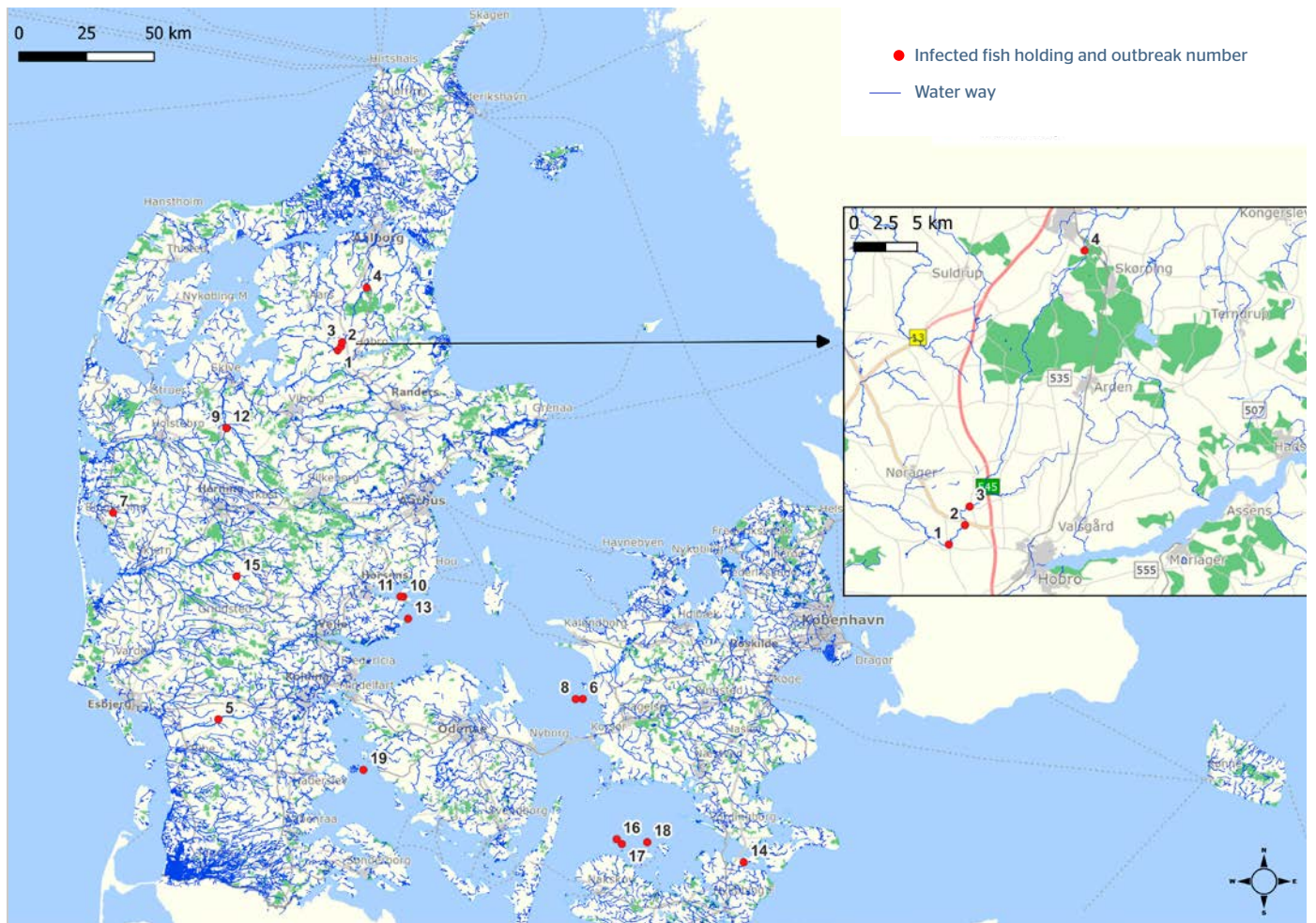
In 2022, 19 confirmed cases of infectious haematopoietic necrosis were confirmed in Denmark (see Figure 4). Ten confirmed cases were from saltwater fish farms, and nine confirmed cases were from freshwater fish farms. Most outbreaks could be explained epidemiologically by hydrodynamic conditions or by the movement of fish. No outbreaks were confirmed in the IHN-free compartments or

in the compartment with the approved eradication programme for IHN. The DVFA has a national surveillance programme for IHN in accordance with Annex VI, Part III of Regulation (EU) 2020/689. 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

Infections with HPR-deleted infectious salmon anaemia virus (ISAV) have never been reported in Denmark, and the whole territory is approved free from HPR-deleted ISAV by the European Union according to Annex XIV to Commission Implementing Regulation (EU) 2021/620. However, an infection with HPRO infectious salmon anaemia virus was detected in a facility for the restoration of wild salmon in 2019.

Figure 4. IHN infected fish holding in Demark in 2022
Map of the 19 outbreaks of IHN in 2022



BOX 14

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



Infectious pancreatic necrosis virus (IPNV) and bacterial kidney disease (BKD) are present in Denmark. Ongoing surveillance is conducted for IPNV and BKD, and breeding and production farms can be registered as IPNV-free and BKD-free by the DVFA. Denmark has 25 freshwater fish farms registered as being IPNV-free and 15 freshwater fish farms as being BKD-free (Executive Order No. 1492 og 12 December 2019 on the surveillance and registration of IPN and BKD). These 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 aquaculture production businesses (APBs) registered as free from IPN and/or BKD. Those APBs are inspected and sampled twice a year if the fish are reared at broodstock farms and once a year if they are reared at production farms. 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.

Koi herpesvirus disease

The last occurrence of koi herpesvirus disease (KHV) in Denmark was in 2021. KHV has never been reported in Danish carp farms, but has occasionally been detected in imported ornamental koi carp and in garden ponds with koi carp.

Spring viraemia of carp

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

Viral haemorrhagic septicaemia

The last outbreak of viral haemorrhagic septicaemia (VHS) in Denmark was confirmed in January 2009, and the whole continental territory of Denmark 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 began in 2009 and ended in November 2013.

The programme had been 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 comprises two years of intensified surveillance in which 75 fish are sampled and analysed twice a year from each fish farm supplied by saltwater.

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

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

Epizootic haematopoietic necrosis virus	Never reported
Infection with <i>Aphanomyces invadans</i> (epizootic ulcerative syndrome)	Never reported
Infection with <i>Gyrodactylus salaris</i>¹	Suspected, but not confirmed
Infection with HPR-deleted infectious salmon anaemia virus	Never reported
Infection with HPRO infectious salmon anaemia virus	2019 ²
Infection with salmonid alphavirus	Never reported
Infectious haematopoietic necrosis	Disease present
Koi herpesvirus disease	2021
Red sea bream iridoviral disease¹	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 HPRO 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.



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, a number of marine aquaculture facilities producing mussels on ropes (lines or nets) in water column have been established in Denmark. In 2022, the annual production totalled approximately 8,500 tonnes of mussels.

Infection with *Bonamia ostreae*

In March 2015, *B. ostreae* was detected in samples collected in November 2014 in the inlet of Limfjorden. This was the first time that the disease was ever reported in Denmark. Since the detection in 2015, the presence of the disease has been confirmed every year. In 2022, *B. ostreae* was detected 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.

Information pertaining to the WOA-listed mollusc diseases is given in Table 24.

Table 24: Occurrence of WOA-listed mollusc diseases in Denmark

Infection with abalone herpesvirus^{1,2}	Never reported
Infection with <i>Bonamia exitiosa</i>²	Never reported
Infection with <i>Bonamia ostreae</i>	Disease present
Infection with <i>Marteilia refringens</i>	Never reported
Infection with <i>Perkinsus marinus</i>	Never reported
Infection with <i>Perkinsus olseni</i>	Never reported
Infection with <i>Xenohaliotis californiensis</i>^{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 legislation³.

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 products 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).

³ 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.

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.





4. Livestock statistics

Table 25: Livestock population. Establishments and animals in Denmark, 2020-2022

		2020	2021	2022
Cattle	Animals	1,513,084	1,483,019	1,486,686
	Establishments	16,181	15,516	14,888
Sheep	Animals	139,633	131,610	129,742
	Establishments	6,149	6,002	5,916
Goats	Animals	18,745	18,698	18,255
	Establishments	3,001	3,087	3,102
Horses	Animals	175,000 ¹	175,000 ¹	175,000 ¹
	Establishments	78,000 ²	78,000 ²	11,143 ³
Farmed deer	Animals	13,201	12,417	12,673
	Establishments	458	457	468
Pigs	Animals	13,311,160	13,626,322	13,265,113
	Establishments	7,698	7,663	7,133
Poultry	Animals	29,201,439	29,533,554	33,799,031
	Establishments	1,282	1,235	1,158

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

¹ Estimate based on registrations in the national horse database.

² Source: Statistics Denmark.

³ From the Central Husbandry Register. From August 2021, all establishments with horses could register in the Central Husbandry Register. The DVFA estimates that the number of establishments with horses is 20,000-25,000.

Table 26: Animals imported from the EU and third countries to Denmark 2020-2022

	2020	2021	2022
Horses¹	2,823	2,986	3,474
Cattle²	73	113	223
Pigs³	25	35	2
Sheep/goats	1,216 ⁵	694	143
Poultry⁴	5,290,658 ⁶	4,334,373	4,240,546

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 Imports of sheep intended for slaughter.

⁶ Imports of mainly day-old chicks.

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

Table 27: Animals exported from Denmark to the EU and third countries, 2020-2022

	2020	2021	2022
Horses¹	541	3,957	5,537
Cattle²	80,212	92,474	66,295
Pigs	15,029,923	12,685,501	12,814,040
Sheep/goats	706	450	42
Poultry³	64,112,987	73,860,831	86,333,230

¹ Horses, asses, mules and hinnies.

² Bovine animals.

³ Fowls of the species *Gallus gallus domesticus*, ducks, geese, turkeys and guinea fowls.

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



5. Index of diseases

A

African horse sickness	17, 18, 64
African swine fever (ASF)	11, 13, 27, 45-50
Anthrax	30
Aujeszky's disease	11, 14, 18, 21, 30, 47-48
Avian chlamydiosis	63
Avian infectious laryngotracheitis	63
Avian influenza	13, 17-18, 53-63
Avian mycoplasmosis (<i>Mycoplasma gallisepticum</i>)	63
Avian mycoplasmosis (<i>Mycoplasma synoviae</i>)	63

B

Bacterial kidney disease (BKD)	72
Bluetongue	14, 18, 21, 22, 27, 30
Bovine anaplasmosis	38
Bovine babesiosis	38
Bovine genital campylobacteriosis	38
Infectious bovine rhinotracheitis (IBR)/Infectious pustular vulvovaginitis (IPV)	18, 37-38
Bovine spongiform encephalopathy (BSE)	12, 18, 33-35, 38
Bovine virus diarrhoea	14, 18, 33, 36-39
<i>Brucella</i> /brucellosis	11, 14, 18, 21-23, 30, 39, 43
<i>Burkholderia mallei</i> (Glanders)	64-65
Bursal disease (Gumboro disease)	63

C

Caprine arthritis/encephalitis	40, 43
Classical swine fever	11, 18, 45-51
Contagious agalactia	43
Contagious bovine pleuropneumonia	38
Contagious caprine pleuropneumonia	43
Contagious equine metritis	64-65
Covid-19	66
Crimean Congo haemorrhagic fever	30

D

Dourine	64-65
Duck virus hepatitis	63

E

<i>Echinococcus granulosus</i>	30
<i>Echinococcus multilocularis</i>	30
Enzootic abortion of ewes (ovine chlamydiosis)	43
Enzootic bovine leukosis	14, 18, 33, 36-38
Epizootic haematopoietic necrosis virus	17, 70, 73
Epizootic haemorrhagic disease	30
Equid herpesvirus-1 (EHV-1)	64
Equine encephalomyelitis (Eastern)	30
Equine encephalomyelitis (Western)	64
Equine arteritis virus/Equine viral arteritis	64-65
Equine infectious anaemia	64-65
Equine influenza	64
Equine piroplasmiasis	64

F

Foot and mouth disease	16-18, 21, 23, 30
Fowl typhoid	63

G

Glanders	64-65
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H

Haemorrhagic septicaemia	70, 72-73
Heartwater	20

I

Infection with abalone herpesvirus	74
Infection with <i>Aphanomyces invadans</i> (epizootic ulcerative syndrome)	73
Infection with <i>Bonamia exitiosa</i>	74
Infection with <i>Bonamia ostreae</i>	74
Infection with <i>Gyrodactylus salaris</i>	73
Infection with HPR-deleted infectious salmon anemia (ISA) virus	73
Infection with HPRO infectious salmon anaemia virus	73
Infection with <i>Marteilia refringens</i>	74
Infection with <i>Perkinsus marinus</i>	74
Infection with <i>Perkinsus olseni</i>	74
Infection with salmonid alphavirus	70, 73
Infection with <i>Xenohalotis californiensis</i>	74
Infectious haematopoietic necrosis	70-71, 73
Infectious pancreatic necrosis virus (IPNV)	72

J

Japanese encephalitis	30
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K

Koi herpesvirus disease	72-73
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L

Lumpy skin disease	38
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M

Maedi-visna	40, 43
<i>Mycobacterium Tuberculosis</i>	18, 21, 24-25, 30
Myxomatosis	66

N

Nairobi sheep disease	43
New World screwworm (<i>Cochliomyia hominivorax</i>)	30
Newcastle disease	53, 56-57, 62-63
Nipah virus encephalitis	50

O

Old World screwworm (<i>Chrysomya bezziana</i>)	30
Ovine epididymitis (<i>Brucella ovis</i>)	43

P

Paratuberculosis	30
Peste des petits ruminants	18, 43
Porcine cysticercosis	50
Porcine epidemic diarrhoea (PED) virus	11, 51
Porcine reproductive and respiratory syndrome virus (PRRS)	50
Pullorum disease	63

Q

Q fever	30, 39
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R

Rabbit haemorrhagic disease	66
Rabies	18, 21, 25, 30
Red sea bream iridoviral disease	73
Rift Valley fever	30
Rinderpest	30

S

Salmonellosis (<i>Salmonella abortusovis</i>)	43
Scrapie (transmissible spongiform encephalopathy, classical scrapie)	40-43
Sheep pox and goat pox	13, 43
Spring viraemia of carp	70-73
Surra (<i>Trypanosoma evansi</i>)	30

T

Transmissible gastroenteritis (TGE)	50-51
Transmissible spongiform encephalopathy (classical scrapie)	40, 43
Trichinellosis (<i>Trichinella</i> spp.)	11, 21, 26, 28, 30, 46-48
Trichomonosis	38
Trypanosomosis	38
Tularemia	30
Turkey rhinotracheitis	63

U

Usutu virus	27, 29
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V

Venezuelan equine encephalomyelitis	64
Viral haemorrhagic septicaemia (VHS)	14, 18, 70-73

W

West Nile Fever	11, 13, 30
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