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Preface

It is a pleasure for me to present the 2017 Annual Report on Animal Health in Denmark on behalf of the Danish Veterinary and Food Administration (DVFA).

This Annual Report first gives a general presentation of the Danish animal health surveillance and contingency planning.

The report then reviews developments in 2017 in the field of animal health in Denmark, the focus being on the OIE-listed diseases and the animal diseases that are notifiable in Denmark.

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

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

Camilla Brasch Andersen
Deputy Chief Veterinary Officer
Head of the Animal Health Division
1. Animal health surveillance and contingency planning

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

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

Disease eradication and control programmes have been developed in parallel with the increase in animal production in order to improve animal health, animal welfare and the production of healthy foods. Diseases in animals are controlled due to concerns of animal welfare to prevent infections in humans and animals and because of food safety and trade interests. The extensive trade in Danish animals and animal products is highly dependent of a good health status of Danish livestock. For many years, the number of cloven-hoofed animals imported to Denmark has been remarkably low, as appears from Table 26 (Chapter 4). The basis for issuing export certificates for Danish products is described in Box 4.

The DVFA constantly aims at adapting the legal framework of disease control to changes in farming practices, disease risks, etc. To this end, the contingency plans for disease outbreaks are revised on a regular basis and operational capabilities are continuously being improved to provide a prompt and effective response to every single suspected case or outbreak of a notifiable infectious livestock disease.

Information on livestock statistics is given in Chapter 4 of this report.

For many years, the number of cloven-hoofed animals imported to Denmark has been remarkably low, as appears from Table 26 (Chapter 4).

The basis for issuing export certificates for Danish products is described in Box 4.
Animal Health in Denmark

1. Animal health surveillance & contingency planning
Improvements are carried out, the emphasis being on:

- Reduction of the probability of the introduction of exotic livestock diseases in Denmark.
- Minimisation of the risk that a disease will spread across the nation by restricting hazardous animal trade practices and improving biosecurity measures in peacetime.
- Effective disease surveillance and early detection of diseases.
- Appropriate and effective actions for the control of disease outbreaks.

**Animal disease preparedness**

**Obligation to notify suspicions**

The Danish Animal Health Act\(^1\) is the legislative basis for the current notification procedures. The Act also lays down the animal diseases notifiable in Denmark and gives powers to require the notification of suspected cases of those diseases. Furthermore, the Act gives powers to carry out diagnostic and epidemiological investigations, impose movement restrictions, create protection and surveillance zones, control movements within such zones, take samples, slaughter infected and in-contact animals, pay compensation, destroy carcasses and potentially infective materials, carry out cleaning and disinfection and, if necessary, carry out emergency vaccination.

The notifiable animal diseases listed in Executive Order No. 1332 of 18 November 2016 are divided into two groups: list 1 and list 2 diseases. Any suspicion of a disease on list 1 must immediately be notified to the DVFA, whereas notification of a disease on list 2 is only mandatory after confirmation of the disease. The Danish list 1 of notifiable diseases includes all serious diseases in animals as well as several zoonotic diseases. A description of all notifiable animal diseases in Denmark is available at [www.fvst.dk](http://www.fvst.dk) (in Danish).

Effective surveillance for clinical diseases is required for early detection of disease outbreaks. According to the Animal Health Act, any farmer is obliged to call a veterinarian right away if he suspects a notifiable disease. The veterinarian must immediately notify the relevant Veterinary Inspection Unit (VIU) of the DVFA if he suspects a disease on list 1. A veterinary officer from the VIU will inspect the herd within a specified number of hours (three or five hours depending on whether the suspicion is raised at a slaughterhouse or a farm) and make a report to the DVFA on the suspected case. If the veterinary officer cannot rule

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\(^1\) The Animal Health Act has been amended since the year under review. The Act was most recently amended by Consolidation Act No. 998 of 2 July 2018. (in Danish).
In 2012, the Danish Veterinary and Food Administration (DVFA) launched a project to evaluate the status of the general contingency plan to obtain an assessment of the emergency status relative to the current disease risks and the organisational changes to both the DVFA and the farming industry.

The project developed recommendations on possible adjustments to the contingency plan and the development of an economic model for more cost-effective operational capabilities.

The first result achieved in 2014 was a model developed to estimate the need for staff and resources during outbreaks of animal diseases. The model details the need for staff with specialised competences as well as many types of equipment needed in different scenarios during a large outbreak of a notifiable infectious livestock disease.

The next result of the project, the identification of the training needs of DVFA staff, was achieved in 2015. An upgrade of the training programme was initiated after the knowledge needed by staff to take on specific tasks in case of outbreaks had been identified.

In 2015, a report was made of the results of the economic cost-effectiveness analysis of operational capabilities. The direct and indirect costs for preventing the introduction of diseases in Denmark, running surveillance programmes, and maintaining biosecurity procedures and animal traceability systems are mainly covered by pig farmers (DKK 148 million annually) and cattle farmers (DKK 63 million annually). The Government (and thus the taxpayers) mainly defrays the operating costs for maintaining operational capabilities, which amount to DKK 27 million annually. These costs must be weighed against the expected losses associated with an outbreak of foot and mouth disease in Denmark, which would be in the order of DKK 8-9 billion.

In 2017, the project focused on the development of a simulation model for African swine fever outbreaks in the Danish pig population. The modelling studies identified a new and superior method for early detection of African swine fever (ASF) by performing PCR testing of one dead animal per pig holding per day in ASF control zones. Therefore, the ASF contingency plan will be updated to ensure the use of this surveillance method in case of an outbreak.

In 2017, the project focused on the development of a simulation model for African swine fever outbreaks in the Danish pig population.
The DVFA offers compensation to animal owners who suffer a loss due to a notifiable disease.

out the suspicion of a list 1 disease, official restrictions are imposed on the herd, and test material is collected and dispatched to the National Veterinary Institute, Technical University of Denmark.

As a second line of defence, official veterinarians are responsible for inspecting all animals at shows and assembly centres (whether for production, slaughter or export). Also ante-mortem inspections and post-mortem examinations at slaughterhouses are important elements of the surveillance system.

The role of the private veterinarian in animal health surveillance in Denmark is described in Box 2.

Handling of suspected cases
The DVFA ensures the uniform handling of all suspected cases through the application of ‘action cards’, which have been developed for most of the notifiable diseases. The action cards available on the DVFA intranet list all necessary actions to be taken while handling a suspected case.

Transparency in dealing with suspected cases and outbreaks
All suspected cases of a notifiable disease will immediately be announced on the website of the DVFA. This database resource displays information on each individual suspicion. This is done to increase the awareness among farmers and veterinarians of the potential presence of the relevant notifiable disease.

In case of an outbreak of a notifiable disease that implies the loss of animals and/or eggs and the destruction of contaminated feed, the DVFA offers compensation for the value of the animals, eggs and feed. In most outbreaks, this value is estimated by a valuation committee. The committee has three members, one appointed by the herd owner, one appointed by the DVFA and one being an employee of the DVFA. The premises are cleaned and disinfected according to a fixed plan, the cleaning and disinfection being paid by the DVFA. Furthermore, the DVFA pays 20% of the estimated loss of income due to the loss of production. If the outbreak is in either cattle or pigs, the Pig Levy Fund or the Cattle Levy Fund covers the remaining loss of income.

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

Compensation for losses caused by notifiable diseases
The DVFA offers compensation to animal owners who suffer a loss due to a notifiable disease. The offer of compensation contributes significantly to compliance with the obligation to notify listed diseases.
Pathogen-specific surveillance
Denmark has several pathogen-specific surveillance programmes aimed at demonstrating the absence of diseases that usually cause insignificant clinical symptoms, or at determining the occurrence, prevalence or distribution of diseases or infections. 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 special focus on infectious diseases that have increased in incidence in other countries and may further spread in the near future and potentially be introduced into Danish territories. The DVFA has implemented a rapid and systematic model for assessing the threat of disease introduction in case of disease outbreaks in other EU Member States or certain countries outside the EU. See more information on the assessment of the threat of disease introduction in Box 3 in this chapter.
Box 2
The role of private veterinarians in national contingency plans

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

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

The most important aims of VASCs are to maintain focus on advice and the prevention of diseases rather than treatment to ensure the prudent use of antimicrobials to minimise antimicrobial resistance and hence improve animal welfare. Having signed a VASC, the farmer consults the same veterinarian every time. This gives the veterinarian a unique insight into the health of the herd and enables a faster reaction to disease outbreaks in the herd. Private veterinarians are also part of the national contingency plans. If a farmer suspects a notifiable animal disease, he is obliged to contact his veterinarian immediately. In such 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 a specified number of hours and report the suspected case to the DVFA. All suspected cases of notifiable diseases will immediately be registered in a database and announced on the website of the DVFA. Depending on the nature of the suspected disease, the international animal health organisations will also be notified. A national database and a web interface have been set up to increase the awareness among farmers and veterinarians of the potential presence of certain notifiable diseases.

The veterinarian acts as a first-line defence in the surveillance of notifiable animal diseases.

A VASC is a means to ensure that the veterinarian advises the farmer of ways to increase the general health of his herd, while the veterinarian also acts as a first-line defence in the surveillance of notifiable animal diseases.
Examples of Danish surveillance programmes for emerging diseases are given below.

Cattle farmers are offered laboratory examination of material from abortions (foetus, placenta and blood sample from the mother cow). Through post-mortem examinations and microbiological and histological examinations, the material is examined for brucellosis, bovine virus diarrhoea and any new emerging infections.

Blood samples from outdoor poultry are tested for West Nile fever. See more information on the surveillance scheme for West Nile virus in Denmark in Box 6 in section 2.1 of this report.

Carcasses of pigs submitted for post-mortem examination are tested for classical swine fever and African swine fever. See more information on the supplementary surveillance for African swine fever and classical swine fever in Box 7 in section 2.4 of this report.

A special surveillance programme for porcine epidemic diarrhoea was initiated by the DVFA in 2014 and continued in 2017. See more information on the non-existence of porcine epidemic diarrhoea virus in Denmark in Box 8 in section 2.4 of this report.

Animal identification and registration
Denmark has a comprehensive system for animal identification and registration (I&R) based on:
- A central database
- Holding registers
- Ear tags
- Movement registrations
- On-the-spot inspections

The Central Husbandry Register
The most important element of the I&R system is the national database called the Central Husbandry Register (CHR), which is owned and operated by the DVFA.

The CHR stores information on all farms with cattle, pigs, sheep, goats, deer, fur animals, aquaculture animals and commercial herds of poultry and game birds. The information recorded on each holding is its unique holding code, the address and the geographic coordinates of the holding, data regarding the owner and keeper of the relevant herds (name, address and contact details), animal species, number of animals of all species\(^2\), allocation of ear tags and veterinary information (e.g. if official restrictions are imposed on the herd).

The CHR also stores information on each individual head of cattle. Information on the individual animal

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\(^2\) For aquaculture farms, the annual production is recorded in kilograms.
The Central Husbandry Register is publicly available at https://chr.fvst.dk

includes the unique animal identification code, date of birth, breed, sex, identification code of the dam (in case of embryo transfer both the genetic and surrogate dams are recorded), information on offspring (only for females), allocation of ear tags, including replacement tags, all movements of the animal (date, place and type of movement) and veterinary events, if any. In 1999, the European Commission approved the CHR as being a fully operational database for cattle registration.

Finally, movements of pigs, sheep and goats are recorded in the CHR. For each batch of animals moved, the following information is recorded: Number of animals moved, date of shipment, identification numbers of the holdings involved and registration number and country code of the vehicle used for transportation (only for movements of pigs).

The Central Husbandry Register is publicly available at https://chr.fvst.dk (in Danish).

The use of the CHR to control animal diseases
The CHR is an effective tool for tracing contact herds to herds suspected of or infected with a notifiable disease. Furthermore, the CHR helps control any further spreading of diseases, since the competent authority will impose movement restrictions on holdings and individual animals should a suspected case arise or a notifiable disease break out. Restrictions will also be imposed in case of failure to comply with the provisions on animal identification and registration. This implies that the relevant farmer is not allowed to move animals from his holding, and no accompanying movement documents will be issued.

Moreover, to ensure the production of safe food, all slaughterhouses must consult the CHR before slaughtering cattle to make sure that the individual animal is correctly recorded in the CHR, and that the relevant animal or herd is not under restrictions. Before slaughtering pigs, sheep and goats, slaughterhouses must also make sure that the herd from which the animals are shipped to slaughter is not under restrictions.

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

Despite a history of few disease outbreaks, the DVFA has put great efforts into preparing and revising its contingency plans. These plans include all necessary actions to be taken when handling infected herds in order to ensure an efficient control of a disease outbreak.
The Danish Veterinary and Food Administration (DVFA) monitors outbreaks of high-impact animal diseases in the EU, the Nordic countries and countries neighbouring the EU.

The increase in global mobility, trade in live animals and animal products, and interaction with livestock production systems in other countries, e.g. through transport vehicles, pose the risk that foreign infectious diseases will be introduced into Denmark.

The DVFA has implemented a rapid and systematic model for qualitative assessments of the threat of disease introduction in case of disease outbreaks in other EU Member States or certain countries outside the EU.

In 2017, specific threat assessments were made for avian influenza, African swine fever and West Nile fever due to outbreaks in the EU and countries neighbouring the EU.

Such assessments include an evaluation of the risk that the disease will be introduced into Danish territories, the risk that Danish herds will be exposed to the disease and the consequences of a potential introduction of the disease into the livestock population. If the overall estimation shows that the threat is non-negligible, the DVFA will consider the initiation of risk mitigation actions.

Results of the assessments are made publicly available by the DVFA at www.fvst.dk (in Danish). If necessary, important risk mitigation actions to be taken are suggested in these reports, e.g. the tracing of imports, increased awareness of vehicles for international transport of animals, the testing of recently imported live animals and specific information to relevant groups of the public.
All contingency plans are publicly available at www.fvst.dk

**The general contingency plan and the disease-specific plans**
The Danish contingency plans comprise an overall eradication strategy, tools for eradication, a crisis organisation and a crisis communication plan. The disease-specific manuals include operational instructions for those involved in managing the response to the following diseases: foot and mouth disease, classical swine fever, African swine fever, bovine spongiform encephalopathy, scrapie, avian influenza, Newcastle disease, bluetongue, lumpy skin disease, Rift Valley fever, peste des petits ruminants, sheep pox and goat pox, epizootic haemorrhagic disease, African horse sickness, West Nile fever and diseases in aquaculture. All contingency plans are publicly available at www.fvst.dk (in Danish).

The following types of specific information are included in the disease-specific contingency plans: characteristics and epidemiology of the disease, sampling procedures, disease-specific cleaning and disinfection procedures, restriction zones, instructions for screening, and emergency vaccination.

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

**Vaccination policy**
The methods for disease control in the Danish contingency plans are quarantining of farms suspected of housing infected animals, culling of infected animals, cleaning and disinfection, and zoning. In general, preventive vaccination is banned.

However, following an epidemiological analysis of the disease situation, the DVFA may use emergency vaccination to control an outbreak. However, emergency vaccination requires an approval by the European Commission.

**Disease control and eradication - ‘the Danish Model’**
Denmark has a long tradition of eradicating animal diseases. By the mid-1900s, tuberculosis and brucellosis had been eradicated from domestic livestock in Denmark as the result of the close collaboration between the veterinary research laboratory, the veterinary administration authority and the industry since the end of the 1800s.

Initially, the animal farming industry launched a voluntary initiative to control the occurrence of infections. This initiative gained broad support from all farmers, and effective eradication measures were subsequently supported by legislation.

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

**The disease control organisation**

Danish legal powers, financial provisions and the direct chain of command facilitate the response of the public administration to an outbreak of a notifiable disease. 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 first staffed by employees of the central offices of the DVFA, and the LDCC by employees of the relevant VIU(s). The DVFA has three VIUs with local veterinary officers specifically trained in managing suspected cases and outbreaks of notifiable animal diseases.

**Training**

The veterinarians of the DVFA, including veterinarians of the VIUs, plan and prepare training in practical issues related to the contingency plans and train field staff through seminars, targeted courses and the participation in simulation exercises.

Veterinary officers from the DVFA maintain their expertise in recognising the symptoms of specific notifiable diseases at the National Veterinary Institute, Technical University of Denmark. At the Institute, the veterinary officers are given the opportunity to observe the development of diseases.
Box 4
Certification of animal products

EU legislation lays down the general principles and requirements of food law. According to Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002, Member States exporting products of animal origin must generally comply with bilateral agreements with third countries. However, products of animal origin complying with the relevant EU legislation may be exported to all third countries at the exporter’s own expense and risk. Regulation (EC) No 882/2004 governs official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules.

The issuing of certificates for products of animal origin is based on national legislation (Executive Order No. 555 of 29 May 2017 implementing Council Directive 96/93/EC). Certificates must be based on a thorough investigation of the background to the certification. Furthermore, the certifying officer must be impartial and independent from commercial interests. According to the rules for issuing certificates in Denmark, certificates may be issued on the basis of regular auditing and verification procedures at establishments. Certificates will be issued based on facts obtained within the context of monitoring programmes, officially recognised quality assurance schemes and epidemiological surveillance programmes by a person authorised by the competent authority. The certifying officer must not certify data of which s/he has no personal knowledge or which cannot be ascertained. No blank or incomplete certificates, or certificates for products which have not been inspected or are no longer available for inspection, can be issued.

If an animal disease breaks out, all Danish certificates of animals and animal products in which data on disease status have been certified are immediately assessed by the DVFA, and no new certificates will be issued if certified data no longer apply.
in research experiments, e.g. in pigs artificially infected with classical or African swine fever.

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

The concept of two-year exercise programmes that was put in place by the DVFA in 2015 continued through 2017 with focus on different categories of exercises and diseases.

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

- **Procedure exercises**: Training in disease-handling procedures.
- **Dilemma exercises**: Desktop exercises to simulate a specific dilemma or train the use of new software.
- **Crisis management exercises**: Exercises with a broader scope, such as the assessment of resources, setting up of crisis centres, actions to control outbreaks, communication, and collaboration between national or international partners as either local training or full-scale national simulation training.
- **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 (N-B VCG)), also as cross-border exercises at international level. Full-scale exercises are conducted at an interval of 3-5 years, and extensive contingency exercises are carried out regularly for all eight Nordic and Baltic countries.

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

In 2017, Denmark participated in a joint Nordic-Baltic African horse sickness simulation exercise planned by the N-B VCG, an exercise involving more than 400 participants. As a member of the N-B VCG, Denmark also took part in the planning of this simulation exercise.
An overview of the animal health status in Denmark for OIE-listed diseases is given at the end of each section for the relevant animal category.

Information on the Danish strategies for the prevention and control of animal diseases is given in Chapter 1 of this report and on the website of the Danish Veterinary and Food Administration at https://dvfa.dk (in Danish).
2.1 Multiple species diseases

For decades, Denmark has experienced no outbreaks of Aujeszky’s disease, brucellosis in bovine herds, foot and mouth disease, sylvatic rabies or trichinellosis. Brucellosis has not been detected in Danish pig herds since 1999.

Furthermore, Denmark is free from disease caused by *Brucella melitensis*, which has never been recorded in Denmark.

Aujeszky’s disease

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

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

Two suspected cases of Aujeszky’s disease were notified to the Danish Veterinary and Food Administration (DVFA) in 2017. Both cases were due to seropositive animals. Official restrictions were imposed on the herds under suspicion while epidemiological investigation and further labora-

The number of blood samples for Aujeszky’s disease examined during the period 2015-2017 is given in Table 1.

<table>
<thead>
<tr>
<th>Year</th>
<th>Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>36,819</td>
</tr>
<tr>
<td>2016</td>
<td>48,051</td>
</tr>
<tr>
<td>2017</td>
<td>44,247</td>
</tr>
</tbody>
</table>

Source: National Veterinary Institute, Technical University of Denmark, and other official laboratories in the EU.
As from 1 January 2011, Denmark has been recognised as free from bluetongue according to Commission Regulation (EC) No 1266/2007.

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

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

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

The DVFA was notified of three suspected cases of bluetongue in cattle in 2017. One case was reported due to a seropositive animal. Two cases were reported due to clinical symptoms; however, one case was rejected by the relevant Veterinary Inspection Unit (VIU) based on the evaluation of the clinical symptoms. Official restrictions were imposed on the herds under suspicion while laboratory testing was conducted. The virological tests of samples from all herds under suspicion proved negative.

A surveillance programme for bluetongue has been implemented in Denmark according to Commission Regulation (EC) No 1266/2007. Serological tests were performed on blood samples collected from 60 cattle herds in 2017. In total, 600 blood samples were tested. All tested negative for bluetongue.

Vector surveillance activities have been carried out in Denmark since the first outbreak of bluetongue. For further details on vector surveillance, see Box 5.
Box 5
Surveillance for Culicoides, mosquitoes and tick-borne pathogens in Denmark in 2017

Since 2012, the Danish Veterinary and Food Administration (DVFA) and the National Veterinary Institute, Technical University of Denmark, have carried out systematic surveillance of mosquito and biting midge abundance during the warmer half of the year. Vectors have been collected on a weekly basis using octenol and CO₂-baited suction traps in private gardens and light traps at cattle farms. National average abundance estimates have been published weekly at www.myggetal.dk (in Danish). Additional traps have been operated permanently at Copenhagen Airport to monitor potential introductions of exotic mosquito species. In 2017, the seasonal vector surveillance was expanded to include weekly surveillance of four groups of Tabanidae biting flies at three different sites (a horse farm, a pig holding and a cattle holding). From June 2017, the surveillance also included all stages of Ixodes ricinus ticks (larvae, nymphs and adults). The surveillance of ticks continued throughout the year although less frequently during the cold period.

The summer of 2017 was relatively cold, which resulted in an average mosquito year. The year was also a normal Culicoides year without any pronounced autumn generation, resulting in low transmission potential in the late summer and autumn. The low number and short season of Tabanidae biting flies was a likely result of the low summer temperatures, but several years of surveillance data are needed to determine the seasonal pattern and the annual variation in abundance of Tabanidae on Danish farms. Ticks had a long season in Denmark in 2017, lasting to the middle of November after peaking in July and August.

In early 2017, a golden jackal was accidentally shot in Western Denmark. The jackal carried 21 Dermacentor reticulatus male ticks, 18 of which were infected with the zoonotic pathogen Rickettsia raoultii. This is the first time that Dermacentor ticks have been found in Danish wildlife and the first time ever that R. raoultii has been recorded in Denmark. The jackal was likely to have migrated with the ticks from jackal breeding areas in the border region between Germany, Poland and the Czech Republic.
Brucellosis

Denmark has been recognised as officially free from brucellosis in bovine herds since 1979 (Commission Decision 2003/467/EC). The official Danish eradication programme for brucellosis in bovine herds began in 1948, and all cattle herds were identified as free from brucellosis in 1959. Brucellosis has not occurred in cattle in Denmark since 1962. All bulls at semen collection centres are regularly tested in accordance with the provisions of Council Directive 88/407/EEC. Cattle intended for export to certain countries outside the EU are also tested. In 2017, 55 aborted foetuses from cattle underwent laboratory testing for brucellosis. All tested negative.

Brucellosis has not been detected in pigs since 1999, when *Brucella suis* biovar 2 was diagnosed in a herd of free-range pigs. The source of the infection was never found, but it is suspected that *B. suis* biovar 2 had been transmitted from European brown hares in the area. *B. suis* biovar 2 has not been detected in hares since 2002, when it was diagnosed in two wild hares found dead. All boars at semen collection centres are regularly tested in accordance with the provisions of Council Directive 90/429/EEC. Also breeding pigs intended for export to certain countries outside the EU are tested for brucellosis. Due to fluctuations in trade, the number of samples tested varies during the period under review.

*Brucella melitensis* has never been reported in Denmark, and Denmark has been recognised as being officially free from *B. melitensis* since 1995 (Commission Decision 94/877/EC). A serological surveillance programme for *B. melitensis* is carried out by testing blood samples collected through the

<table>
<thead>
<tr>
<th>Year</th>
<th>Cattle: Blood samples</th>
<th>Pigs: Blood samples</th>
<th>Sheep and goats: Blood samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>1,650</td>
<td>26,557</td>
<td>2,448</td>
</tr>
<tr>
<td>2016</td>
<td>2,352</td>
<td>40,929</td>
<td>2,329</td>
</tr>
<tr>
<td>2017</td>
<td>1,007</td>
<td>33,429</td>
<td>1,986</td>
</tr>
</tbody>
</table>

Source: National Veterinary Institute, Technical University of Denmark, and other official laboratories in the EU.
In 2017, 14 suspected cases of brucellosis were notified to the DVFA, three in cattle, nine in pigs and two in sheep. Three suspected cases in cattle and one in a pig were notified to the DVFA due to clinical signs. Eight cases in pigs and two in sheep were notified because seropositive animals had been identified in surveillance analyses or following contact with seropositive animals. Official restrictions were imposed on all herds under suspicion while confirmatory laboratory testing was conducted. Samples of all suspected cases tested negative at the National Reference Laboratory.

The number of blood samples examined for brucellosis during the period 2015-2017 is given in Table 2.

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

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

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

The monitoring of rabies is based on the testing of animals suspected of being infected with rabies and of bats which have been in contact with other animals or humans. In 2017, 12 bats were tested, and all tested negative. Eight other animals (four cats, one dog, one sheep, one cow and one fox) were submitted for examination. However, all animals tested negative.
In addition, active surveillance for rabies among bats was conducted in 2017. Saliva samples were collected from 101 bats living at three different locations in Denmark. All saliva samples tested negative for European bat lyssavirus (EBLV-1 and EBLV-2).

**Trichinellosis**

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

For more than 80 years, targeted tests have been performed in Denmark without finding any *Trichinella* spp. in pork or horse meat, and Denmark was classified as a region with a negligible risk of trichinellosis in herds of domestic pigs in 2007 (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.

Slaughtered fattening pigs reared under controlled housing conditions in integrated production systems do not have to be tested for *Trichinella* spp. However, the Danish pig-rearing 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. All animals of susceptible species that are slaughtered at Danish slaughterhouses are examined in accordance with the methods prescribed in Commission Implementing Regulation (EC) No 2015/1375.

The number of animals from each category of slaughtered animals examined under the Danish trichinellosis surveillance programme during the period 2015-2017 appears from Table 3.

Information pertaining to the OIE-listed multiple species diseases is given in Table 4.
### Table 3

Animals examined under the Danish trichinellosis surveillance programme, 2014-2016

<table>
<thead>
<tr>
<th>Year</th>
<th>Pigs (incl. boars and sows)</th>
<th>Farmed wild boars</th>
<th>Horses</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>18,694,043</td>
<td>414</td>
<td>1,520</td>
</tr>
<tr>
<td>2016</td>
<td>18,774,085</td>
<td>594</td>
<td>1,542</td>
</tr>
<tr>
<td>2017</td>
<td>17,340,351</td>
<td>445</td>
<td>1,542</td>
</tr>
</tbody>
</table>

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

Information pertaining to the OIE-listed multiple species diseases is given in Table 4.
During the past few years, several outbreaks of infection with West Nile virus (WNV) have occurred in southern and central Europe, which indicates that this infection is becoming established in Europe. As WNV may spread further north with migratory birds from endemic areas, surveillance activities were set up to determine whether the infection had reached Danish territories.

In 2017, the Danish Veterinary and Food Administration (DVFA), the National Veterinary Institute (Technical University of Denmark) and the Natural History Museum of Denmark (University of Copenhagen) continued the ongoing surveillance for WNV in Denmark.

Various material (avian blood and mosquitoes) was collected for surveillance: Serum from outdoor poultry (410 individuals) and migratory birds (250 individuals) was included in the serological surveillance programme and tested for WNV-specific antibodies. Altogether 660 samples were examined, and seven samples of serum from migratory birds (medium/long distance migratory species) were found positive for WNV antibodies. This indicates that at least seven of the migratory birds that stayed in or passed through Denmark in 2017 had been exposed to WNV at some point in their lives, probably during the annual winter stay in Africa.

Further, mosquitoes collected through the insect vector surveillance programme mentioned in Box 5 (30 pools, or a total of 275 mosquitoes) were examined for WNV. All samples tested negative. This means that no viral RNA was found in the material collected.

In conclusion, data from the 2017 surveillance programme indicate that there is not yet an active ongoing WNV infection in the Danish bird and mosquito populations. However, there is no doubt that migratory birds provide a link between WNV-endemic areas and Denmark.

Selected material collected under this programme was further tested for the Usutu virus (USUV) and corresponding antibodies: Mosquitoes were tested for USUV. Selected serum samples from migratory birds were tested for USUV-specific antibodies. All tests were negative.
Table 4
Last occurrence of OIE-listed multiple species diseases in Denmark

<table>
<thead>
<tr>
<th>Disease</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthrax</td>
<td>1988</td>
</tr>
<tr>
<td>Bluetongue</td>
<td>2008</td>
</tr>
<tr>
<td>Crimean Congo haemorrhagic fever¹</td>
<td>Never reported</td>
</tr>
<tr>
<td>Epizootic haemorrhagic disease</td>
<td>Never reported</td>
</tr>
<tr>
<td>Equine encephalomyelitis (Eastern)</td>
<td>Never reported</td>
</tr>
<tr>
<td>Heartwater¹</td>
<td>Never reported</td>
</tr>
<tr>
<td>Infection with Aujeszky's disease virus</td>
<td>1991</td>
</tr>
<tr>
<td>Infection with Brucella abortus, Brucella melitensis and Brucella suis</td>
<td>Cattle: 1962, Pigs: 1999, Sheep and goats: Never reported</td>
</tr>
<tr>
<td>Infection with Echinococcus granulosus</td>
<td>Not reported²</td>
</tr>
<tr>
<td>Infection with Echinococcus multilocularis</td>
<td>2017³</td>
</tr>
<tr>
<td>Infection with foot and mouth disease virus</td>
<td>1983</td>
</tr>
<tr>
<td>Infection with rabies virus</td>
<td>1982⁴</td>
</tr>
<tr>
<td>Infection with Rift Valley fever virus</td>
<td>Never reported</td>
</tr>
<tr>
<td>Infection with rinderpest virus</td>
<td>1782</td>
</tr>
<tr>
<td>Infection with Trichinella spp.</td>
<td>1930</td>
</tr>
<tr>
<td>Japanese encephalitis</td>
<td>Never reported</td>
</tr>
<tr>
<td>New World screwworm (Cochliomyia hominivorax)¹</td>
<td>Never reported</td>
</tr>
<tr>
<td>Old World screwworm (Chrysomya bezziana)¹</td>
<td>Never reported</td>
</tr>
<tr>
<td>Paratuberculosis¹</td>
<td>Disease present⁵</td>
</tr>
<tr>
<td>Q fever</td>
<td>2017</td>
</tr>
<tr>
<td>Surra (Trypanosoma evansi)¹</td>
<td>Never reported</td>
</tr>
<tr>
<td>Tularemia</td>
<td>2016⁶</td>
</tr>
<tr>
<td>West Nile fever</td>
<td>Never reported</td>
</tr>
</tbody>
</table>

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 carries out a voluntary control programme.
⁶ Detected in wildlife (rabbit).
Animal Health in Denmark

2.2 Cattle diseases
2.2 Cattle diseases

In Denmark, 18% of the cattle farms are dairy farms, and 82% produce beef. The trend towards fewer but larger dairy herds has been evident for many years. Dairy herds account for most of the production with 575,000 milking cows producing 5,370,000 tonnes of milk each year. The rest of the herds comprise 90,000 cows for beef production.³

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

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

Bovine spongiform encephalopathy (BSE)

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

- Risk assessment identifying historical and existing risks and showing that appropriate measures have been taken to manage each identified risk.
- The feed ban which has been in place in Denmark since 1990 (ruminant-to-ruminant feed ban).
- The most recent tightening of the feed ban in January 2001 when processed animal proteins were banned in feed for production animals.
- No BSE cases in cattle born after the most recent tightening of the feed ban in January 2001.
- The comprehensive Danish BSE testing programme with a little over 2.7 million tests performed since the beginning of 2001.
- The long period of 19 years that has passed since the birth of the youngest Danish case of BSE.

³ Source: SEGES.
No cases of BSE have been found in Denmark since 2009 when a BSE case was found in a 14-year old cow. In the period 2000-2009, a total of 18 cases of BSE were detected. The youngest Danish case of BSE was a cow born in 1999. No BSE-positive animals have been born after the implementation of the total feed ban in 2001. This fact highlights the importance and effectiveness of the total feed ban.

**Surveillance for BSE**

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

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

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

The current Danish BSE surveillance programme implements the most recent European TSE legislation laid down in Commission Regulation (EC) No. 999/2001 as amended and Commission Decision 2009/719/EC as amended. It follows from the amendment to Decision 2009/719/EC that certain Member States, including Denmark, are authorised to make revisions to their BSE surveillance programmes.

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 had 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.

In 2017, one suspected case of BSE was notified to the DVFA. Results of the laboratory tests of samples from the suspected case were negative.

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 2015-2017 are shown in Table 6.
Bovine tuberculosis

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

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

The Danish surveillance programme demonstrating the absence of tuberculosis in cattle comprises post-mortem examination of all slaughtered animals as part of the meat inspection programme at the slaughterhouses. Furthermore, bulls at semen collection centres are regularly tuberculin-tested in accordance with the provisions of Council Directive 88/407/EEC. Cattle intended for export to certain countries outside the EU are also tested. In 2017, 847 animals were tested for bovine tuberculosis. The last outbreak of tuberculosis in cattle occurred in 1988, the infection being of human origin. However, bovine tuberculosis was also diagnosed in farmed deer in 1988. A surveillance programme for bovine tuberculosis comprising all Danish herds of farmed deer was initiated in 1989. The last outbreak of tuberculosis in Danish farmed deer occurred in 1994.

Bovine virus diarrhoea

Bovine virus diarrhoea (BVD) was diagnosed in four Danish cattle herds in 2017. Official restrictions were imposed on the infected herds.

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

In 2006, the eradication programme had almost reached the end, and all herds were considered free unless proved otherwise. The remaining infected herds were kept under movement restrictions. Since 2006, BVD has reoccurred in few Danish herds every year.

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

The number of bulk milk samples and the number of blood samples from beef herds examined during the period 2015-2017 are given in Table 7.

**Enzootic bovine leukosis**

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

In 2017, the DVFA was notified of five suspected cases of EBL due to clinical symptoms. One of these cases was rejected by the relevant Veterinary Inspection Unit (VIU) of the DVFA based on an evaluation of the clinical symptoms. Official restrictions were imposed on the herds of origin while laboratory testing was being conducted. All suspected cases tested negative.

EBL has been notifiable 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.

<table>
<thead>
<tr>
<th>Year</th>
<th>Bulk milk samples</th>
<th>Blood samples from beef herds</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>14,012</td>
<td>24,318</td>
</tr>
<tr>
<td>2016</td>
<td>15,017</td>
<td>21,828</td>
</tr>
<tr>
<td>2017</td>
<td>12,708(^1)</td>
<td>25,209</td>
</tr>
</tbody>
</table>

Source: SEGES.

1 3,298 dairy herds as per 1 July 2017 (Source: Central Husbandry Register).
Since 2011, the Danish surveillance programme demonstrating the absence of EBL in cattle has comprised post-mortem examination of all slaughtered animals as part of the meat inspection programme at the slaughterhouses. Furthermore, bulls at semen collection centres are regularly tested in accordance with the provisions of Council Directive 88/407/EEC. Cattle intended for export to certain countries outside the EU are also tested. In 2017, a total of 1,489 animals were tested.

**Infectious bovine rhinotracheitis/infectious pustular vulvovaginitis**

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

IBR has occasionally reoccurred in Denmark. However, the official disease-free status has not been lost. The most recent case of IBR in Denmark was in a single animal diagnosed in 2005.
In 2017, the DVFA was notified of two suspected cases of IBR due to clinical symptoms. The results of the virological tests for IBR on samples from the herds under suspicion were negative.

The national serological surveillance programme intended to demonstrate the absence of IBR was implemented in April 1984. The surveillance programme includes testing for IBR antibodies in bulk milk samples from dairy herds and blood samples from beef herds. 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. The sampling strategy is based on an epidemiological assessment of the results from the surveillance programme. Furthermore, bulls at semen collection centres are regularly tested in accordance with the provisions of Council Directive 88/407/EEC. Cattle intended for export to certain countries outside the EU are also tested. Due to fluctuations in trade, the number of samples has changed during the period under review.

The number of bulk milk samples and the number of blood samples from beef herds examined for IBR during the period 2015-2017 are given in Table 8.

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

### Table 8
Bulk milk samples and blood samples examined under the Danish infectious bovine rhinotracheitis surveillance programme, 2015-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Bulk milk samples</th>
<th>Blood samples from beef herds</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>13,934</td>
<td>15,012</td>
</tr>
<tr>
<td>2016</td>
<td>13,070</td>
<td>12,897</td>
</tr>
<tr>
<td>2017</td>
<td>13,017¹</td>
<td>14,571</td>
</tr>
</tbody>
</table>

Source: SEGES.

¹ 3,298 dairy herds as per 1 July 2017 (Source: Central Husbandry Register).

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

<table>
<thead>
<tr>
<th>Disease</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bovine anaplasmosis</td>
<td>Never</td>
</tr>
<tr>
<td>Bovine babesiosis</td>
<td>Suspected, but not confirmed</td>
</tr>
<tr>
<td>Bovine genital campylobacteriosis</td>
<td>1886</td>
</tr>
<tr>
<td>Bovine spongiform encephalopathy (BSE)</td>
<td>1995</td>
</tr>
<tr>
<td>Bovine tuberculosis</td>
<td>1994</td>
</tr>
<tr>
<td>Bovine virus diarrhoea</td>
<td>Disease present</td>
</tr>
<tr>
<td>Enzootic bovine leukosis</td>
<td>1990</td>
</tr>
<tr>
<td>Haemorrhagic septicaemia</td>
<td>Never</td>
</tr>
<tr>
<td>Infection with <em>Mycoplasma mycoides subsp. mycoides SC</em> (contagious bovine pleuropneumonia)</td>
<td>1886</td>
</tr>
<tr>
<td>Infectious bovine rhinotracheitis (IBR)</td>
<td>2005</td>
</tr>
<tr>
<td>Infectious pseudourine vulvoaginitis (IPV)</td>
<td></td>
</tr>
<tr>
<td>Lumpy skin disease</td>
<td>Never</td>
</tr>
<tr>
<td>Thellassospora</td>
<td>Never</td>
</tr>
<tr>
<td>Trichomonosis</td>
<td>1990</td>
</tr>
<tr>
<td>Trypanosomosis</td>
<td>Never</td>
</tr>
</tbody>
</table>

¹ The disease is not notifiable in Denmark.
Animal Health in Denmark
2.3 Sheep and goat diseases
2.3 Sheep and goat diseases

Classical scrapie has never been reported in Denmark.

However, few of the sheep and goat diseases listed by the OIE in 2017 have occurred in Denmark, such as Maedi-visna in sheep and caprine arthritis/encephalitis in goats. Maedi-visna and caprine arthritis/encephalitis are included in the voluntary control and surveillance programme for lentivirus.

**Caprine arthritis/encephalitis**

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

A voluntary control programme for the lentivirus causing arthritis/encephalitis in goats was initiated in 1979 and is being managed by SEGES, the Danish Agriculture and Food Council. Herds included in this programme must be tested every three years to maintain the disease-free status because a herd’s disease status has implications for the sale of live animals from that herd.

In 2017, 95 of 466 goats tested under the control programme were serologically positive (source: National Veterinary Institute, Technical University of Denmark).

**Maedi-visna**

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

In 2017, 2,232 sheep were tested; 255 tested positive (Source: National Veterinary Institute, Technical University of Denmark).
The most recent case of atypical scrapie was diagnosed in a seven-year old sheep in 2016 after five years without any cases.

Table 10
Results of the Danish surveillance programme for TSEs in sheep, 2015-2017

<table>
<thead>
<tr>
<th>Category</th>
<th>2015</th>
<th></th>
<th>2016</th>
<th></th>
<th>2017</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Animals tested</td>
<td>Positive animals</td>
<td>Animals tested</td>
<td>Positive animals</td>
<td>Animals tested</td>
<td>Positive animals</td>
</tr>
<tr>
<td>Fallen stock</td>
<td>661</td>
<td>0</td>
<td>680</td>
<td>1(^1)</td>
<td>503</td>
<td>0</td>
</tr>
<tr>
<td>Healthy slaughter animals</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Cases of clinically suspected TSE</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>662</td>
<td>0</td>
<td>680</td>
<td>1</td>
<td>505</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: The EU TSE database.

\(^1\) A case of atypical scrapie.

Transmissible spongiform encephalopathy

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

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

Atypical scrapie was first detected in Denmark in 2006. The most recent case of atypical scrapie was diagnosed in a seven-year old sheep in 2016 after five years without any cases. However, cases of atypical scrapie are not surprising as this disease can appear spontaneously in old animals.

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

Since 2002, more than 70,000 animals have been tested for TSEs, which is quite a large number considering that the Danish population of sheep and goats is rather small (for population data see Chapter 4).
Table 11
Results of the Danish surveillance programme for TSEs in goats, 2015-2017

<table>
<thead>
<tr>
<th>Category</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Animals tested</td>
<td>Positive animals</td>
<td>Animals tested</td>
</tr>
<tr>
<td>Fallen stock</td>
<td>109</td>
<td>0</td>
<td>132</td>
</tr>
<tr>
<td>Healthy slaughter animals</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cases of clinically suspected TSE</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>109</td>
<td>0</td>
<td>132</td>
</tr>
</tbody>
</table>

Source: The EU TSE database.

Classial scrapie has never been reported in Denmark.
For countries with a national control programme for classical scrapie as Denmark, the most stringent EU rules on imports still apply.

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 surveillance programme according to the rules of Commission Regulation (EC) No 1874/2003, as amended by Commission Regulation (EC) No 546/2006. According to the Danish surveillance programme, all fallen sheep and goats older than 18 months were tested, and Denmark was, therefore, granted additional guarantees regarding stringent import rules.

At the beginning of 2012, Denmark was allowed to amend the extended Danish surveillance programme and to test only random samples of fallen sheep and goats each year. The amendment was allowed due to the substantial number of TSE tests performed without finding any cases of classical scrapie. The sample size is now determined by the size of the population and the rules laid down in the TSE Regulation (Council Regulation (EC) No 999/2001) as amended (Annex III).
A major amendment to the TSE Regulation concerning imports was made in 2013 in order to approximate EU legislation and the OIE Terrestrial Animal Health Code. This amendment also repealed Commission Regulation (EC) No 1874/2003. Denmark has maintained the status of a country with an extended surveillance programme, even though the TSE Regulation now refers to the programme as a national control programme for classical scrapie. For countries with a national control programme for classical scrapie as Denmark, the most stringent EU rules on imports still apply.

The results of the surveillance programmes for TSEs in sheep and goats in Denmark in the period 2015-2017 are shown in Tables 10 and 11. Information pertaining to the OIE-listed diseases in sheep and goats is given in Table 12.

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

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

1 The disease is not notifiable in Denmark.
2.4 Swine diseases

The Danish pig production is characterised by large, industrialised pig farms. Approximately 90% of the production is exported either as live piglets for fattening or as meat or meat products.4

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

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

If an animal of a herd shows clinical symptoms which give rise to the suspicion of ASF, the herd will be placed under official restrictions while laboratory testing and epidemiological investigations are conducted. If a pig shows clinical symptoms of ASF, classical swine fever (CSF) is also suspected.

In 2017, 13 suspected cases of ASF (or CSF) were notified to the Danish Veterinary and Food Administration. 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.

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 farms infected with ASF in countries along the eastern borders of the EU. The risk mitigating measures include the washing and disinfection of vehicles when they enter EU territory.

4 Source: Danish Agriculture & Food Council.
ASF reached the eastern territories of the EU in 2014. To prevent the disease from spreading any further, risk mitigating measures have been put in place in the affected countries.

In 2017, 265 samples were tested under the Danish surveillance programme for ASF. All samples tested negative. For more information on this surveillance programme, see Box 7.

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

If any animals of 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 2017, 13 suspected cases of CSF (or ASF) were notified to the Danish Veterinary and Food Administration (DVFA). Seven of them were contact herds of suspected herds. Two cases were suspected due to clinical signs in a pig at the ante-mortem or post-mortem inspection at a slaughterhouse, one case was suspected due to a seropositive reaction, and three cases were reported due to clinical symptoms in animals in herds.

One of these cases was rejected by the relevant Veterinary Inspection Unit (VIU) of the DVFA after a thorough assessment of anamnesis, and another case was rejected by the VIU after the post-mortem examination and a thorough clinical examination of pigs in the herd of origin. As regards the last suspected case, the herd of origin was subjected to thorough clinical examination and laboratory testing. Official restrictions were imposed on the herds under suspicion while epidemiological investigation and laboratory testing were conducted. All samples tested free from CSF and ASF.

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

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

In 2017, 265 samples were tested under the Danish surveillance programme for ASF. All samples tested negative. For more information on this surveillance programme, see Box 7.
Material from carcasses of swine submitted for post-mortem examination is included in the surveillance programme for African swine fever (ASF) and classical swine fever (CSF) as a supplement to serological surveillance.

Carcasses are selected on the basis of 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.

Due to fluctuations in trade, the number of samples tested for CSF changed significantly during the period under review. The number of samples examined in 2015-2017 is given in Table 13.

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

### Table 13
Serum samples from pigs examined under the Danish classical swine fever surveillance programme, 2015-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>28,399</td>
</tr>
<tr>
<td>2016</td>
<td>41,842</td>
</tr>
<tr>
<td>2017</td>
<td>35,705</td>
</tr>
</tbody>
</table>

Source: National Veterinary Institute, Technical University of Denmark, and other official laboratories in the EU.

### Box 7
Supplementary surveillance for African swine fever and classical swine fever

As a supplement to the serological surveillance, pig carcasses submitted for post-mortem examination are tested for CSF and ASF. Further details are given in Box 7.

On an annual basis, samples from approximately 240 carcasses of swine are tested for ASF and CSF under this programme. In 2017, 265 carcasses were tested; all tested free from ASF and CSF.
Box 8
No porcine epidemic diarrhoea virus in Denmark

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

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

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

From October to December 2014, approximately 2,000 blood samples were tested in a PED ELISA developed by the National Veterinary Institute, Technical University of Denmark. The ELISA was developed to detect both the original European and the Asian/Asian 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 2017, 571 blood samples were subjected to serological testing and 240 samples to virological testing. All samples tested negative for PED.

2017

In 2017, 571 blood samples were subjected to serological testing and 240 samples to virological testing. All samples tested negative.
The last outbreak of CSF in Denmark was in 1933.

Table 14
Last occurrence of OIE-listed swine diseases in Denmark

<table>
<thead>
<tr>
<th>Disease</th>
<th>Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>African swine fever</td>
<td>Never reported</td>
</tr>
<tr>
<td>Infection with classical swine fever virus</td>
<td>1933</td>
</tr>
<tr>
<td>Infection with <em>Taenia solium</em> (Porcine cysticercosis)</td>
<td>Not reported¹</td>
</tr>
<tr>
<td>Nipah virus encephalitis</td>
<td>Never reported</td>
</tr>
<tr>
<td>Porcine reproductive and respiratory syndrome (PRRS)</td>
<td>Disease present²</td>
</tr>
<tr>
<td>Transmissible gastroenteritis</td>
<td>Never reported</td>
</tr>
</tbody>
</table>

¹ Year of last outbreak is not known.
² PRRS is endemic in Denmark.
2.5 Poultry diseases

Few poultry diseases listed by the OIE occurred in Denmark in 2017.

The EU-coordinated surveillance programme for avian influenza (AI) in poultry as revised in 2015 continued in 2017.

Avian influenza

The highly pathogenic avian influenza (HPAI) H5N8 epidemic that started at the end of 2016 continued during the winter and spring of 2017. A total of 17 dead wild birds were diagnosed with HPAI H5N8 in 2017. Furthermore, a flock of captive birds in an open air museum was diagnosed with HPAI H5N8 in February 2017.

In February 2017, Denmark regained its status as a country free from notifiable avian influenza according to Article 10.4.3 of the OIE Terrestrial Animal Health Code. The free status was maintained during the rest of 2017.

<table>
<thead>
<tr>
<th>Species</th>
<th>Positive birds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accipitridae</td>
<td>11</td>
</tr>
<tr>
<td>Common buzzard</td>
<td>7</td>
</tr>
<tr>
<td>Peregrine falcon</td>
<td>1</td>
</tr>
<tr>
<td>White-tailed eagle</td>
<td>3</td>
</tr>
<tr>
<td>Anatidae</td>
<td>2</td>
</tr>
<tr>
<td>Common eider</td>
<td>1</td>
</tr>
<tr>
<td>Widgeon</td>
<td>1</td>
</tr>
<tr>
<td>Laridae</td>
<td>4</td>
</tr>
<tr>
<td>Great black-backed gull</td>
<td>3</td>
</tr>
<tr>
<td>Herring gull</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
</tr>
</tbody>
</table>

Table 15: HPAI H5N8 in dead wild birds by species in 2017
Figure 1
Dead wild birds tested for avian influenza in 2017.

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

- H5N8 positive birds.
- H5N8 negative birds.
- A dead wild bird diagnosed with influenza type A other than H5 or H7 (on the island of Langeland).
- A dead wild bird diagnosed with LPAI H5 (in the municipality of Kalundborg).
Highly pathogenic avian influenza H5N8

Wild birds

In 2017, the Danish Veterinary and Food Administration (DVFA) continued the intensive surveillance scheme for avian influenza in wild birds due to the highly pathogenic avian influenza (HPAI) H5N8 epidemic in Europe, which started in the autumn of 2016 and continued during the winter and spring of 2017.

In total, 154 dead wild birds were submitted for laboratory examination in 2017, most of them in the first quarter of the year. The DVFA used the media to increase the awareness of avian influenza in wild birds and to encourage the public to report findings of dead wild birds. The Danish Emergency Management Agency assisted with the collection and submission of the reported birds to the National Reference Laboratory. Sequence analyses revealed that the HPAI H5N8 virus detected in Denmark was similar to the virus found in other European countries.

The monitoring of dead wild birds covered the whole country, and a total of 17 dead wild birds with HPAI H5N8 were detected (see Figure 1). The last positive bird was found on 4 April 2017. The most frequently infected bird species were tufted ducks (43%), great black-backed gulls (14%), swans (14%) and birds of prey (14%) (see Table 15).

On 12 April 2017, Denmark decided to lift the order to keep poultry and other captured birds indoors. This housing order had been in place since November 2016. The prohibition of fairs, markets, shows and other gatherings of poultry and other captured birds was also lifted. The reason for this step was the improved avian influenza situation in Denmark and the rest of Europe combined with animal welfare concerns.
In total, six holdings/flocks tested positive in a serological test in 2017. However, PCR testing showed no circulation of virus in the poultry.

**Other captive birds**

On 7 February 2017, it was confirmed that highly pathogenic avian influenza H5N8 had been detected in ‘other captive birds’ at an open air museum located in Maribo on the island of Lolland. That was the first outbreak of HPAI since November 2016.

The flock had three geese, four hens and a cock. The birds were defined as ‘other captive birds’ according to Article 2(6) of Council Directive 2005/94/EC, since they were exclusively kept for exhibition. This outbreak in ‘other captured birds’ did not affect Denmark’s OIE avian influenza-free status according to Article 10.4.1 of the Terrestrial Animal Health Code.

Clinical signs were observed in the geese, and one goose died. A decrease in feed and water intake.
EU surveillance programmes for avian influenza (AI) in poultry and wild birds have been in place in Denmark since 2003. As a supplement to these programmes, a special programme for early warnings of AI in commercial poultry and hobby poultry has been in place since 2005. All samples tested due to an early warning of AI are also tested for Newcastle disease (ND) as a differential diagnosis.

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

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

Early warnings are notified to the Danish Veterinary and Food Administration (DVFA), and samples are collected from ten birds of the flock for virological examination.

Twelve early warnings of AI were notified to the DVFA in 2017. All samples tested free from AI and ND.
The surveillance programme for avian influenza in poultry and game birds for restocking

The Danish surveillance programme for AI in poultry and game birds for restocking was established to find and eradicate any AI virus of subtype H5 or H7 circulating in the poultry population by killing all birds of infected holdings. Surveillance for AI has been in place throughout the whole country since 2006. Initially, the surveillance programme comprised two levels: a standard level of testing all over the country and an intensified level of testing in an area extending 3 km inland from the coastline and from the shore of all large lakes. The surveillance programme was revised in 2015 following a risk assessment. Subsequently, the surveillance level has been the same all over the country without any specific risk areas defined. All commercial holdings in the target group having more than 100 animals are included in the programme. Breeder hens (central rearing flocks) and pullets are tested before release to egg production, outdoor layers four times a year and outdoor slaughter poultry (broilers, ducks and geese) before slaughter. In addition, fattening turkeys are tested before slaughter. Breeder ducks and geese are required to be tested once a year.

Farmed game birds for restocking (gallinaceous birds and waterfowl) are tested four times during the production season from February to August. Breeding animals undergo serological testing, and their offspring virological testing.

When traded, poultry and game birds have to be accompanied by a certificate stating that the flock has been tested within the preceding three months in case of poultry, and two months in case of game birds. The surveillance programme is mainly based on serology. PCR testing is used only for offspring from game birds. Additionally, PCR testing is used in case of a positive serological result to confirm whether the relevant flock is infected by the AI virus.

In total, six holdings/flocks tested positive in a serological test in 2017. However, PCR testing showed no circulation of virus in the poultry.

Results from the serological surveillance programme are shown in Table 16.

Five cases were rejected after a thorough assessment of anamnesis, three cases tested negative in the virological test, and one tested positive for HPAI H5N8 (see ‘Other captive birds’ on page 54).
Table 16
Results of the Danish serological surveillance programme for avian influenza in poultry and game birds for restocking, 2017

<table>
<thead>
<tr>
<th>Poultry category</th>
<th>Holdings (h)/flocks (f) in Denmark</th>
<th>Holdings (h)/flocks (f) tested</th>
<th>Serologically positive holdings/flocks (H5, H7)</th>
<th>Virologically positive holdings/flocks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fattening turkeys</td>
<td>59 (h)</td>
<td>16 (f)</td>
<td>0 0 0</td>
<td>- -</td>
</tr>
<tr>
<td>Chicken breeders</td>
<td>205 (f)</td>
<td>168 (f)</td>
<td>0 0 0</td>
<td>- -</td>
</tr>
<tr>
<td>Free-range laying hens</td>
<td>166 (f)</td>
<td>135 (f)</td>
<td>1 0 0</td>
<td>0 0</td>
</tr>
<tr>
<td>Free-range broilers</td>
<td>66 (h)</td>
<td>25 (h)</td>
<td>0 0 0</td>
<td>- -</td>
</tr>
<tr>
<td>Breeder ducks</td>
<td>0 (h)</td>
<td>0 (h)</td>
<td>0 0 0</td>
<td>- -</td>
</tr>
<tr>
<td>Breeder geese</td>
<td>0 (h)</td>
<td>0 (h)</td>
<td>0 0 0</td>
<td>- -</td>
</tr>
<tr>
<td>Fattening geese</td>
<td>8 (h)</td>
<td>1 (h)</td>
<td>0 0 0</td>
<td>- -</td>
</tr>
<tr>
<td>Fattening ducks</td>
<td>100 (h)</td>
<td>15 (h)</td>
<td>0 0 0</td>
<td>- -</td>
</tr>
<tr>
<td>Mallards bred for restocking of game birds 3</td>
<td>24 (h)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Breeding animals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pheasants, partridges, rock partridges and red-legged partridges 3</td>
<td>68 (h)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Breeding animals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total positives</td>
<td></td>
<td></td>
<td>3 2 1</td>
<td>0 0</td>
</tr>
</tbody>
</table>


1 The holdings/flocks do not necessarily have active production throughout the year.
2 Some flocks/holdings were tested more than once a year; the figures only include one annual testing per flock/holding.
3 Offspring from game-birds are virologically tested. Those figures are not included in this table.
Newcastle disease

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

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

If poultry show clinical symptoms of AI, ND is also suspected, and official restrictions are imposed on the farm while an epidemiological investigation of the flock is carried out and laboratory testing is conducted. In 2017, nine suspected cases of clinical avian influenza were notified to the DVFA; however, five cases were rejected after a thorough assessment of anamnesis. The rest of the suspected cases tested free from both AI and ND.

All 12 early warnings for avian influenza in 2017 were also examined, and the cases were tested for ND; however, all samples tested free from ND.

Information pertaining to the OIE-listed poultry diseases is given in Tables 18 and 19.
Table 18
Outbreaks of poultry diseases listed by the OIE and notifiable in Denmark, 2015-2017¹

<table>
<thead>
<tr>
<th>Poultry disease</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avian chlamydiosis²</td>
<td>34</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>Avian infectious laryngotracheitis²</td>
<td>13</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Infection with highly pathogenic avian influenza viruses (poultry)</td>
<td>(2006)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Infection with highly pathogenic avian influenza A virus (other captured birds)</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

¹ The year of the last occurrence is stated in brackets if there were no outbreaks of the disease in the relevant year.
² Occurrence mainly in ornamental, hobby and backyard birds.

Table 19
Last occurrence of other OIE-listed poultry diseases not notifiable in Denmark

<table>
<thead>
<tr>
<th>Poultry disease</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Avian infectious bronchitis</td>
<td>Suspected, but not confirmed</td>
</tr>
<tr>
<td>Avian mycoplasmosis (<em>Mycoplasma synoviae</em>)</td>
<td>Not reported¹</td>
</tr>
<tr>
<td>Duck virus hepatitis</td>
<td>Suspected, but not confirmed</td>
</tr>
<tr>
<td>Infectious bursal disease (Gumboro disease)</td>
<td>2015</td>
</tr>
<tr>
<td>Turkey rhinotracheitis</td>
<td>2007</td>
</tr>
</tbody>
</table>

¹ Year of last outbreak is not known.
2.6 Equine diseases

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

**Contagious equine metritis**
*Taylorella equigenitalis*, which causes contagious equine metritis (CEM), has not been reported in Denmark since 2009. Microbiological examinations are performed 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 examinations are performed in connection with international trade in horses and horse semen. The Danish Veterinary and Food Administration was notified of one suspected case of dourine in 2017.

The case was reported due to seropositive reactions in samples collected from two horses prior to the export of semen. Official restrictions were imposed on the herd under suspicion while laboratory testing was conducted; however, the samples tested negative for dourine.

Dourine, which is caused by the protozoan parasite *Trypanosoma equiperdum*, has never been reported in Denmark.
Equine infectious anaemia (EIA) has not been reported in Denmark since 1928.

**Equine infectious anaemia**
Equine infectious anaemia (EIA) has not been reported in Denmark since 1928. Serological examinations are performed 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 examinations are performed in connection with international trade in horses and horse semen.

Information pertaining to equine diseases is given in Table 20.

---

### Table 20
Last occurrence of OIE-listed equine diseases in Denmark

<table>
<thead>
<tr>
<th>Disease</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contagious equine metritis</td>
<td>2009</td>
</tr>
<tr>
<td>Dourine</td>
<td>Never reported</td>
</tr>
<tr>
<td>Equine encephalomyelitis (Western)</td>
<td>Never reported</td>
</tr>
<tr>
<td>Equine infectious anaemia</td>
<td>1928</td>
</tr>
<tr>
<td>Equine influenza</td>
<td>Suspected, but not confirmed^2</td>
</tr>
<tr>
<td>Equine piroplasmosis</td>
<td>Not reported^3</td>
</tr>
<tr>
<td>Glanders</td>
<td>1928</td>
</tr>
<tr>
<td>Infection with African horse sickness virus</td>
<td>Never reported</td>
</tr>
<tr>
<td>Infection with equid herpesvirus-1 (EHV-1)^1</td>
<td>2013</td>
</tr>
<tr>
<td>Infection with equine arteritis virus</td>
<td>Suspected, but not confirmed</td>
</tr>
<tr>
<td>Venezuelan equine encephalomyelitis</td>
<td>Never reported</td>
</tr>
</tbody>
</table>

^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.
2.7 Fur animal diseases

In 2017, 1,547 mink farms were registered in Denmark, the annual production of skins exceeding 17 million.\(^5\)

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

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

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

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

In total, Denmark exported more than 185,000 fur animals in 2017.

**Myxomatosis**

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

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

\(^5\) Source: Kopenhagen Fur (owned by the Danish Fur Breeders' Association).
Vaccination against myxomatosis has been allowed in Denmark since 2008.

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

In 2017, rabbit haemorrhagic disease (RHD) was diagnosed on sixteen Danish rabbit farms where several rabbits had died. The wild population is considered a reservoir for the disease.
Box 10
Disease control in mink farms

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

**Aleutian disease (mink plasmacytosis)**

The Danish control programme for Aleutian disease is run by the Danish Fur Breeders’ Association. Outbreaks occur occasionally in the northern part of Jutland north of the Limfjord.

As set out in the control programme, the infected herds are culled, and the farms are cleaned and disinfected.
2.8 Fish diseases

In 2017, 213 aquaculture production businesses (APBs) producing salmonids were registered in Denmark. The majority were freshwater fish farms, but 23 of the 213 APBs were marine fish farms producing rainbow trout in net cages, and nine APBs produced salmonids in saltwater tanks/raceways. The marine fish farms are located in the Belt Sea, south and west of Zealand, along the eastern coast of Jutland and near the island of Samsø.

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

The aquatic animal health surveillance in Denmark consists of the following components: the obligation to notify suspicions of animal diseases, the obligation to notify unsuspected, increased mortality, routine inspections and laboratory examination of surveillance samples.

In 2017, the Danish Veterinary and Food Administration (DVFA) carried out approximately 200 inspections of fish farms. The number of surveillance samples (including export samples) tested in 2017 is presented in Table 21.

Each sample tested is a pooled sample of up to ten fish. The most common species tested is rainbow trout, which constitutes approximately 99% of the production of salmonids in Danish fish farms. Brown trout (Salmo trutta) and brook trout (Salvelinus fontinalis) are also produced in some

The number of surveillance samples (including export samples) tested in 2017 is presented in Table 21.

The types of tissue sampled and the testing methods are also specified in Table 21.
Animal Health in Denmark

2.8 Fish diseases

[Image of fishing nets]
freshwater fish farms. These species are therefore also tested under the surveillance programme. Samples from wild salmon (Salmo salar) and brown trout (Salmo trutta) are also collected for testing under the surveillance programme. A few aquaculture farms produce species such as zander, turbot and eel. Those species are also sampled and tested for viral haemorrhagic septicaemia (VHS) virus and infectious haematopoietic necrosis (IHN) virus. The types of tissue sampled and the testing methods are also specified in Table 21.

### Infectious haematopoietic necrosis

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

### Infectious salmon anaemia

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

---

**Table 21**

Number of surveillance samples (including export samples) tested under the Danish aquacultural surveillance programme in 2017

<table>
<thead>
<tr>
<th>Disease</th>
<th>Type of tissue sampled</th>
<th>Testing method</th>
<th>Number of samples tested in 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epizootic haematopoietic necrosis disease</td>
<td>1</td>
<td>A</td>
<td>128</td>
</tr>
<tr>
<td>Infectious haematopoietic necrosis</td>
<td>1</td>
<td>A</td>
<td>608</td>
</tr>
<tr>
<td>Infection with HPR-deleted or HPRO infectious salmon anaemia virus</td>
<td>2</td>
<td>B</td>
<td>225</td>
</tr>
<tr>
<td>Infection with salmonid alphavirus</td>
<td>1</td>
<td>A</td>
<td>137</td>
</tr>
<tr>
<td>Spring viraemia of carp</td>
<td>1</td>
<td>A</td>
<td>128</td>
</tr>
<tr>
<td>Viral haemorrhagic septicaemia</td>
<td>1</td>
<td>A</td>
<td>624</td>
</tr>
</tbody>
</table>

1. Kidney, spleen and heart (and in some cases brain).
2. Same tissues as in sample type 1 + gills.
3. Each sample tested is a pooled sample of up to ten fish per sample.
In 2010, ISA virus HPRO (type 2) was detected in a RT-PCR analysis of one sample of Atlantic salmon smolt from a facility with mixed fish species and year classes under water recirculation conditions. All samples include gill material to enhance the possibility of identifying HPRO ISA virus. There was no suspicion or clinical signs of ISA at the facility. As no clinical signs of ISA were found, the detection did not meet the case definition under EU legislation, which is identical with the case definition of the OIE. The European Commission was consulted and agreed with the DVFA that the presence of ISA in Denmark had not been confirmed. The facility was sanitised, and no virus has been detected since.

Koi herpesvirus disease

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

In August 2017, KHV was detected in a private garden pond located near the village of Gørslev in the municipality of Køge on Zealand.

<table>
<thead>
<tr>
<th>Table 22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last occurrence of OIE-listed fish diseases in Denmark</td>
</tr>
<tr>
<td><strong>Epizootic haematopoietic necrosis disease</strong></td>
</tr>
<tr>
<td><strong>Never reported</strong></td>
</tr>
<tr>
<td><strong>Infection with Aphanomyces invadans</strong> (epizootic ulcerative syndrome)</td>
</tr>
<tr>
<td><strong>Never reported</strong></td>
</tr>
<tr>
<td><strong>Infection with Gyrodactylus salaris</strong></td>
</tr>
<tr>
<td><strong>Suspected, but not confirmed</strong></td>
</tr>
<tr>
<td><strong>Infection with HPR-deleted or HPRO infectious salmon anaemia virus</strong></td>
</tr>
<tr>
<td><strong>Never reported</strong></td>
</tr>
<tr>
<td><strong>Infection with salmonid alphavirus</strong></td>
</tr>
<tr>
<td><strong>Never reported</strong></td>
</tr>
<tr>
<td><strong>Infectious haematopoietic necrosis</strong></td>
</tr>
<tr>
<td><strong>Never reported</strong></td>
</tr>
<tr>
<td><strong>Koi herpesvirus disease</strong></td>
</tr>
<tr>
<td><strong>2017</strong></td>
</tr>
<tr>
<td><strong>Red sea bream iridoviral disease</strong></td>
</tr>
<tr>
<td><strong>Never reported</strong></td>
</tr>
<tr>
<td><strong>Spring viraemia of carp</strong></td>
</tr>
<tr>
<td><strong>2003</strong></td>
</tr>
<tr>
<td><strong>Viral haemorrhagic septicaemia</strong></td>
</tr>
<tr>
<td><strong>2009</strong></td>
</tr>
</tbody>
</table>

1 The disease is not notifiable in Denmark.
2 The infection was detected in a private garden pond.

The whole continental territory of Denmark was approved as VHS-free by the European Union in 2013.
Infectious pancreatic necrosis virus (IPNV) and bacterial kidney disease (BKD) are present in Denmark. Ongoing surveillance is conducted for IPNV and BKD, and breeding and production farms can be registered as IPNV-free and BKD-free by the DVFA. In 2017, 29 freshwater fish farms were registered as being IPNV-free and 25 freshwater fish farms as being BKD-free (Executive Order No. 967 of 18 July 2013 on surveillance and registration of IPN and BKD).

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

According to section 12 of this Executive Order, fish farms with a disease-free health status and fish farms enrolled in the surveillance programme must immediately notify the DVFA if fish show clinical signs of IPN or BKD.

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

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

**Viral haemorrhagic septicaemia**
The last outbreak of viral haemorrhagic septicaemia (VHS) in Denmark was confirmed in January 2009, and the whole continental territory of Denmark was approved as VHS-free by the European Union in 2013 (Commission Implementing Decision 2013/706/EU). The Danish programme for the eradication of VHS began in 2009 and ended in November 2013. The programme has been approved by the European Commission and was co-financed by the European Fisheries Fund. All freshwater trout farms are approved free from VHS (category I).

**Box 11**
**National disease control plan for infectious pancreatic necrosis virus and bacterial kidney disease in freshwater fish farms**

Infectious pancreatic necrosis virus (IPNV) and bacterial kidney disease (BKD) are present in Denmark. Ongoing surveillance is conducted for IPNV and BKD, and breeding and production farms can be registered as IPNV-free and BKD-free by the DVFA. In 2017, 29 freshwater fish farms were registered as being IPNV-free and 25 freshwater fish farms as being BKD-free (Executive Order No. 967 of 18 July 2013 on surveillance and registration of IPN and BKD).

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

According to section 12 of this Executive Order, fish farms with a disease-free health status and fish farms enrolled in the surveillance programme must immediately notify the DVFA if fish show clinical signs of IPN or BKD.
2.9 Mollusc diseases

Denmark has intensive fisheries of natural mussel stocks (*Mytilus edulis*). Natural stocks of European flat oyster (*Ostrea edulis*) only exist in the Limfjord. The Danish oyster production is mainly based on the utilisation of natural stock. Only at one site are mussels reared under experimental aquaculture conditions.

During the past more than 15 years, a number of marine aquaculture facilities producing mussels on ropes in the water column (in contrast to natural production on the sea bed) have been established in Denmark. At the moment, there are 47 plants with a total annual production of approximately 1,800 tonnes of mussels.

**Infection with *Bonamia ostreae***

In March 2015, *B. ostreae* was detected in surveillance samples collected in November 2014. Infection with *B. ostreae* was also detected in samples collected in 2015 and 2016.

In July 2016, it was decided to discontinue the surveillance in the Limfjord as it is unlikely that the area will regain the disease-free status once its population has become infected. The surveillance was continued in Nissum Bredning, the most western part of the Limfjord, because *B. ostreae* had not been detected in this area. However, *B. ostreae* was detected in samples collected in Nissum Bredning in October and November 2017.

**Infection with *Marteilia refringens***

Infection with *M. refringens* has never been detected in Denmark.

In July 2016, it was decided to discontinue the surveillance for *M. refringens* in southwestern Kattegat, the Belt Sea, the Isefjord and most of the Limfjord. This decision was based on a cost-effectiveness analysis. These areas have therefore shifted disease categories from being ‘disease-free’ to ‘undetermined’ as set out in EU legislation.

The surveillance for *M. refringens* is continued in Nissum Bredning, the most western part of the Limfjord. A declaration of the Danish disease-free status (category I) for *M. refringens* in Nissum Bredning was submitted to the EU in September 2016.

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

<table>
<thead>
<tr>
<th>Infection with</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>abalone herpesvirus$^{1,2}$</td>
<td>Never reported</td>
</tr>
<tr>
<td>Bonamia exitiosa$^2$</td>
<td>Never reported</td>
</tr>
<tr>
<td>Bonamia ostreae</td>
<td>Disease present</td>
</tr>
<tr>
<td>Marteilia refringens</td>
<td>Never reported</td>
</tr>
<tr>
<td>Perkinsus marinus</td>
<td>Never reported</td>
</tr>
<tr>
<td>Perkinsus olseni</td>
<td>Never reported</td>
</tr>
<tr>
<td>Xenohaliotis californiensis$^{1,2}$</td>
<td>Never reported</td>
</tr>
</tbody>
</table>

$^1$ 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. They arise mainly during the slaughter of animals for human consumption, during the production of products of animal origin such as dairy products, and in the course of the disposal of dead animals.

ABPs are categorised, collected, transported, processed, used, stored and disposed of according to EU legislation.7

Animal by-products are divided into three categories depending on the risks associated with each type of product.

- Category 1 includes animals suspected of being infected with TSEs, specified risk material (SRM) from cattle or small ruminants, experimental animals, pet animals, zoo animals and circus animals.
- Category 2 includes manure and by-products presenting a risk of being infected with contagious animal diseases.
- Category 3 includes parts of animals slaughtered for human consumption, raw milk, fish, former foodstuffs of animal origin, blood, hides and skins, hooves, feathers, wool, horns, hair and fur.

Table 24 shows a breakdown of the ABPs produced in Denmark in 2017.

---

Table 24
Animal by-products produced in Denmark in 2017

<table>
<thead>
<tr>
<th>Source</th>
<th>Category 1 (tonnes)</th>
<th>Category 2 (tonnes)</th>
<th>Category 3 (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slaughterhouses/cutting plants</td>
<td>33,031</td>
<td>153,901</td>
<td>308,287</td>
</tr>
<tr>
<td>Fallen stock</td>
<td>15,689</td>
<td>105,440</td>
<td>None</td>
</tr>
</tbody>
</table>

## 4. Livestock statistics

### Table 25
Livestock population. Establishments and animals in Denmark, 2015-2017

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cattle</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animals</td>
<td>1,567,213</td>
<td>1,560,289</td>
<td>1,557,453</td>
</tr>
<tr>
<td>Establishments</td>
<td>17,576</td>
<td>18,002</td>
<td>17,428</td>
</tr>
<tr>
<td><strong>Sheep</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animals</td>
<td>148,226</td>
<td>142,354</td>
<td>147,347</td>
</tr>
<tr>
<td>Establishments</td>
<td>6,687</td>
<td>6,861</td>
<td>6,537</td>
</tr>
<tr>
<td><strong>Goats</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animals</td>
<td>20,082</td>
<td>20,600</td>
<td>19,536</td>
</tr>
<tr>
<td>Establishments</td>
<td>2,997</td>
<td>3,071</td>
<td>3,004</td>
</tr>
<tr>
<td><strong>Horses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animals</td>
<td>170,000(^1)</td>
<td>170,000(^1)</td>
<td>174,500(^2)</td>
</tr>
<tr>
<td>Establishments</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td><strong>Farmed deer</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animals</td>
<td>14,852</td>
<td>14,983</td>
<td>14,490</td>
</tr>
<tr>
<td>Establishments</td>
<td>502</td>
<td>514</td>
<td>486</td>
</tr>
<tr>
<td><strong>Pigs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animals</td>
<td>13,384,992</td>
<td>13,390,751</td>
<td>13,440,375</td>
</tr>
<tr>
<td>Establishments</td>
<td>8,707</td>
<td>8,675</td>
<td>8,526</td>
</tr>
<tr>
<td><strong>Poultry</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animals</td>
<td>33,817,550</td>
<td>29,570,001</td>
<td>32,836,800</td>
</tr>
<tr>
<td>Establishments</td>
<td>1,320</td>
<td>1,239</td>
<td>1,268</td>
</tr>
</tbody>
</table>

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

\(^1\) Estimate based on the number of horse passports issued.
\(^2\) Estimate based on registrations in the national horse database.
### Table 26
Animals imported from the EU and third countries to Denmark 2015-2017

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horses¹</td>
<td>2,645</td>
<td>3,351</td>
<td>3,224</td>
</tr>
<tr>
<td>Cattle²</td>
<td>165</td>
<td>137</td>
<td>168</td>
</tr>
<tr>
<td>Pigs</td>
<td>675⁴</td>
<td>330⁵</td>
<td>3</td>
</tr>
<tr>
<td>Sheep/goats</td>
<td>249</td>
<td>4,215⁶</td>
<td>3,362⁶</td>
</tr>
<tr>
<td>Poultry³</td>
<td>3,852,016</td>
<td>6,788,262²</td>
<td>5,793,280⁷</td>
</tr>
</tbody>
</table>

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

¹ Horses, asses, mules and hinnies.
² Bovine animals.
³ Fowls of the species *Gallus gallus domesticus*, ducks, geese, turkeys and guinea fowls.
⁴ Import of two full herds, extraordinary event.
⁵ Import, extraordinary event.
⁶ Import of sheep intended for slaughter.
⁷ Increased import of day-old chicks.

### Table 27
Animals exported from Denmark to the EU and third countries, 2015-2017

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horses¹</td>
<td>1,078</td>
<td>730</td>
<td>716</td>
</tr>
<tr>
<td>Cattle²</td>
<td>62,722</td>
<td>57,113</td>
<td>62,929</td>
</tr>
<tr>
<td>Pigs</td>
<td>12,463,855</td>
<td>13,421,804</td>
<td>14,673,815</td>
</tr>
<tr>
<td>Sheep/goats</td>
<td>1,710</td>
<td>1,413</td>
<td>1,075</td>
</tr>
<tr>
<td>Poultry³</td>
<td>55,087,210</td>
<td>57,457,138</td>
<td>56,116,342</td>
</tr>
</tbody>
</table>


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

A
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Infection with Aphanomyces invadans (epizootic ulcerative syndrome), 72
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Infection with classical swine fever virus, 11, 14, 17, 44, 46-47, 48, 49
Infection with Echinococcus granulosus, 29
Infection with Echinococcus multilocularis, 29
Infection with equid herpesvirus-1 (EHV-1), 62
Infection with equine arteritis virus, 60, 62
Infection with foot and mouth disease virus, 7, 14, 21, 25, 29
Infection with Gyrodactylus salaris, 72
Infection with highly pathogenic avian
Influenza viruses (poultry), 18, 51, 52, 53, 59
Infection with highly pathogenic avian influenza A virus (other captured birds), 18, 54-55, 59
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Infection with Newcastle disease virus, 14, 55, 58, 59
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Surra (Trypanosoma evansi), 29
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Venezuelan equine encephalomyelitis, 62
Viral haemorrhagic septicaemia, 15, 70, 72, 73
West Nile fever, 11, 13, 14, 28, 29
6. Animal Health Contacts in Denmark

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