Animal Health in Denmark 2016
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It is a pleasure for me to present the 2016 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 2016 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.

John Larsen
Deputy Chief Veterinary Officer
Head of the Animal Health Division
Disease 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.
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 high 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 2.

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.
Improvements are carried out, the emphasis being on:

- Reduction of the probability of an 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 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. 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.

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 local 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 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.

According to the Animal Health Act, any farmer is obliged to call a veterinarian right away if he suspects a notifiable disease.
In 2012, the Danish Veterinary and Food Administration (DVFA) launched a project to evaluate the status of the contingency planning to obtain an assessment of the emergency status relative to the current disease risks and the organisational changes of both the DVFA and the farming industry.

The project developed recommendations on possible adjustments to the contingency planning 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 basic assumptions of the model are tested in simulation exercises.

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 defined.

A report was also made in 2015 of the results of the economic analysis of the cost-effectiveness of the 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 costs for maintaining operational capabilities, which amount to DKK 27 million annually. By far the most expensive activity funded by this amount is the operation of a high-security laboratory for foot and mouth disease virus with an annual budget of DKK 23 million. 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.

The economic analysis made in 2016 underpinned the importance of early detection of new outbreaks and the level of biosecurity in the cattle sector. Furthermore, it showed that increased awareness of the impact of follow-up on low-risk contact farms during an outbreak will reduce the duration of an epidemic and thereby also the magnitude of export losses.

**Box 1** Review of contingency planning for the prevention and control of animal diseases in Denmark - 2016 follow-up

The economic analysis made in 2016 underpinned the importance of early detection of new outbreaks and the level of biosecurity in the cattle sector.
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.

**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.
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 on the Internet 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 is a major contribution towards compliance with the obligation to notify listed diseases.

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.

**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 introduc-
Box 2  Certification of animal products

According to Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002, Member States must comply with bilateral agreements with third countries and are prohibited from exporting products which do not meet the requirements of the importing third country. Regulation (EC) No 882/2004 regulates official controls that are performed to ensure the verification of compliance with feed and food laws, animal health and animal welfare rules.

The certification of products of animal origin is based on national legislation (Order No. 121 of 12 February 2007, which implements Council Directive 96/93/EC). The certification must be based on a thorough investigation of the background for the certification. Furthermore, the certifying officer must be impartial and must not have any commercial interests. According to the rules for issuing certificates in Denmark, certificates may be issued on the basis of regular auditing and verification procedures in the 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.
tion 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.

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, 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 5 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 6 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 2016. See more information on the non-existence of porcine epidemic diarrhoea virus in Denmark in Box 7 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 or 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, 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...
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 information in the CHR is publicly available on the Internet 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.
All contingency plans are publicly available at www.fvst.dk

The general 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, nine exotic diseases (swine vesicular disease, lumpy skin disease, Rift Valley fever, rinderpest, peste des petits ruminants, sheep pox and goat pox, epizootic haemorrhagic disease, vesicular stomatitis and African horse sickness), and aquatic diseases. All contingency plans are publicly available on the Internet 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 experiences 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 opera-
tion 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 Veteri-
mary Inspection Unit (VIU). The DVFA has three
VIUs with veterinary officers especially trained in
managing suspected cases and outbreaks of notifi-
able animal diseases.

Training
The veterinarians of the DVFA, including veterinar-
ians of the VIUs, plan and prepare training in practi-
cal 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 op-
portunity to observe the development of diseases
in research experiments, e.g. calves that have been
artificially infected with foot and mouth disease
or 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.
Box 3 Assessment of the threat of disease introduction

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 2016, specific threat assessments were made for avian influenza and African swine 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 of exposure to Danish herds and the consequences of a potential introduction of the disease in 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 on the website of the DVFA at www.fvst.dk (in Danish). If necessary, important risk mitigation actions to be taken are suggested in these reports, e.g. tracing of imports, increased awareness of vehicles for international transport of animals, testing of recently imported live animals and specific information to relevant groups of the public.
Furthermore, exercises may be used for testing new equipment and procedures.

A new concept of two-year exercise programmes was put in place by the DVFA in 2015 and continued through 2016 with exercises according to plan.

The general idea of the concept was to focus on one specific disease for a two-year period in order to cover all important aspects of that disease. A new disease will be chosen each year for a new exercise programme. Exercises from all categories will be carried out each year, and the experience gained from the exercises in year 1 of the programme relating to a specific disease will be implemented in the exercises carried out in year 2 of that particular exercise programme.

The following categories of exercises are implemented 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 co-operation among the Nordic and the Baltic countries (the Nordic-Baltic Veterinary Contingency Group), also as cross-border exercises at international level.

Full-scale exercises are conducted at an interval of some years, and extensive contingency exercises are carried out regularly for all eight Nordic and Baltic countries.

The exercises may involve other stakeholders, such as the reference laboratory, the Danish Emergency Management Agency, the National Police, agricultural organisations, slaughterhouses and rendering plants.
Animal Health in Denmark

2. Livestock disease status
2. Livestock disease status

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

A highly pathogenic avian influenza (HPAI) H5N8 epidemic started in November 2016 in Denmark. In line with several other European countries, dead wild birds were diagnosed as infected with HPAI H5N8. However, only one backyard poultry flock was infected with HPAI H5N8.

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.
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 an increase in trade, the number of samples tested has risen during the period under review.

Table 1

<table>
<thead>
<tr>
<th>Year</th>
<th>Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>31,968</td>
</tr>
<tr>
<td>2015</td>
<td>36,819</td>
</tr>
<tr>
<td>2016</td>
<td>48,051</td>
</tr>
</tbody>
</table>

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

No suspected cases of Aujeszky’s disease were notified to the Danish Veterinary and Food Administration (DVFA) in 2016.

The number of blood samples examined during the period 2014-2016 is given in Table 1.
Animal Health in Denmark

2.1 Multiple species diseases
The last outbreak of bluetongue (BTV-8) in Denmark occurred in November 2008.

**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 seven suspected cases of bluetongue in 2016: five in cattle, one in a sheep and one in a goat. Four cases were reported due to clinical symptoms, and three cases due to seropositive animals. 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 2016. 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 the vector surveillance, see Box 4.

**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 2016, 81 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...
Box 4 Surveillance for Culicoides, mosquitoes and tick-borne pathogens in Denmark in 2016

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. 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. Mosquito larvae have also been collected from water-filled containers in private gardens in southern Jutland near the border to Germany to detect the invasive mosquito Aedes japonicus. No non-European species have ever been detected in any of the traps.

The summer of 2016 was an average mosquito year. In 2016, a new hot spot was discovered for Culex modestus, the potential bridge vector for the West Nile virus, in a nature protection area just outside of Copenhagen and near the airport.

The prevalence of biting midges was monitored by surveillance traps at three cattle farms in 2016. This year, abundance peaked at an unusually high level in late July and early August, followed by a smaller, but longer lasting peak, ending in October. In September, the long autumn peak combined with unusually high autumn temperatures created a transmission potential for biting midge-transmitted viral infections that was more than twice as high as that of previous years (according to the levels estimated by the Technical University of Denmark using a disease transmission model). The high potential for the spread of the disease lasted well into October.

Ticks collected from urban and suburban parks and other green areas in and around Copenhagen were analysed for the presence of zoonotic pathogens. While the tick abundance was low in Copenhagen compared with nearby forests, the risk of tick bites and Borrelia infections in urban and especially in suburban Copenhagen was non-negligible.

In 2016, samples of migrating birds were screened for ticks during both the spring and autumn migrations. Migrating birds introduced a substantial number of ticks into Danish territory in both the spring and the autumn. These high tick infection rates in birds combined with the large number of birds migrating through Denmark each year cause a potential risk that new pathogens will be introduced as will also new tick species that are presently exotic to Denmark.
Animal Health in Denmark

2.1 Multiple species diseases

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 an increase in trade, the number of samples tested has risen during the period under review.

*B. 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 voluntary lentivirus control programme managed by SEGES (formerly the Knowledge Centre for Agriculture).

In 2016, 12 suspected cases of brucellosis were notified to the DVFA, 11 in pigs and one in a sheep. One suspected case in a pig was notified to the DVFA due to clinical signs. However, the case was rejected by the Veterinary Inspection Unit (VIU) after a thorough assessment of anamnesis. Eleven cases 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 laboratory.

The number of blood samples examined for brucellosis during the period 2014-2016 is presented in Table 2.

<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>2014</td>
<td>1,643</td>
<td>29,853</td>
<td>2,089</td>
</tr>
<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>
</tbody>
</table>

Source: National Veterinary Institute, Technical University of Denmark, and other official laboratories in the EU.
**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 2016, five bats were tested, and all tested negative. Five other animals (three cats, one dog and one cow) were submitted for examination. However, all animals tested negative.

In addition, active surveillance for rabies among bats was conducted in 2016. Saliva samples were collected from 161 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.

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

Slaughtered fattening pigs, boars and sows 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 as not all trading partners accept this 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 2014-2016 is shown in Table 3.

1930

Infections with *Trichinella* spp. have not been reported in domestic animals in Denmark since 1930.
### 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>2014</td>
<td>18,789,608</td>
<td>482</td>
<td>1,346</td>
</tr>
<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>
</tbody>
</table>

Source: Danish Veterinary and Food Administration Laboratory Division and other laboratories accredited to test for *Trichinella*. 
### Table 4
Last occurrence of OIE-listed multiple species diseases in Denmark

<table>
<thead>
<tr>
<th>Disease</th>
<th>Year(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthrax</td>
<td>1988</td>
</tr>
<tr>
<td>Aujeszky's disease</td>
<td>1991</td>
</tr>
<tr>
<td>Bluetongue</td>
<td>2008</td>
</tr>
<tr>
<td>Brucellosis Cattle</td>
<td>1962</td>
</tr>
<tr>
<td>Brucellosis Pigs</td>
<td>1999</td>
</tr>
<tr>
<td>Brucellosis Sheep and goats</td>
<td>Never reported</td>
</tr>
<tr>
<td>Crimean Congo haemorrhagic fever*</td>
<td>Never reported</td>
</tr>
<tr>
<td>Echinococcus granulosus</td>
<td>Not reported$^1$</td>
</tr>
<tr>
<td>Echinococcus multilocularis</td>
<td>2015$^2$</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>Foot and mouth disease</td>
<td>1983</td>
</tr>
<tr>
<td>Heartwater*</td>
<td>Never reported</td>
</tr>
<tr>
<td>Japanese encephalitis</td>
<td>Never reported</td>
</tr>
<tr>
<td>New World screwworm (Cochliomyia hominivorax)*</td>
<td>Never reported</td>
</tr>
<tr>
<td>Old World screwworm (Chrysomya bezziana)*</td>
<td>Never reported</td>
</tr>
<tr>
<td>Paratuberculosis*</td>
<td>Disease present$^3$</td>
</tr>
<tr>
<td>Q fever</td>
<td>Suspected, but not confirmed</td>
</tr>
<tr>
<td>Rabies</td>
<td>1982$^4$</td>
</tr>
<tr>
<td>Rift Valley fever</td>
<td>Never reported</td>
</tr>
<tr>
<td>Rinderpest</td>
<td>1782</td>
</tr>
<tr>
<td>Surra (Trypanosoma evansi)*</td>
<td>Never reported</td>
</tr>
<tr>
<td>Trichinellosis</td>
<td>1930</td>
</tr>
<tr>
<td>Tularemia</td>
<td>2016$^5$</td>
</tr>
<tr>
<td>West Nile fever</td>
<td>Never reported</td>
</tr>
</tbody>
</table>

$^*$ The disease is not notifiable in Denmark.
$^1$ Year of last outbreak not known.
$^2$ Detected in wildlife (foxes).
$^3$ The disease is not officially controlled in Denmark; however, the cattle industry conducts a voluntary control programme.
$^4$ Infection with classical rabies virus in domestic animals.
$^5$ Detected in wildlife (rabbit).
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 2016, 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 (396 individuals) and migratory birds (288 individuals) was included in the serological surveillance programme and tested for WNV-specific antibodies. Altogether 684 samples were examined, and four samples of serum from migratory birds (medium/long distance migratory species) were found positive for WNV antibodies. This indicates that at least four of the migratory birds that stayed in or passed through Denmark in 2016 had been exposed to WNV at some point in their lives, probably during the winter stay in Africa.

- Further, mosquitoes collected through the insect vector surveillance programme mentioned in Box 4 (51 pools, or a total of 527 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 2016 surveillance programme indicates 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, and selected serum samples from migratory birds were tested for USUV-specific antibodies. All tests were negative.
Animal Health in Denmark

2.2 Cattle diseases
2.2 Cattle diseases

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 more than 2.7 million tests performed since the beginning of 2001.
- The long period of 18 years that has passed since the birth of the youngest Danish case of BSE.

No cases of BSE have been found in Denmark since 2009. 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 on slaughtered animals. 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 determined. 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 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 neurological problems had been observed during the ante-mortem inspection at slaughter (AM animals).
- All healthy slaughter animals older than 30 months at slaughter.

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**BSE**

In 1990, a passive surveillance programme for BSE was introduced in Denmark, and BSE was simultaneously made a notifiable disease.
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 neurological problems have been observed during the ante-mortem inspection at slaughter (AM animals).

Moreover, a more stringent testing regime has been in place for several years for animals from other EU Member States without a revised monitoring programme or from countries outside the EU which have a controlled or undetermined risk of BSE.

In 2016, two suspected cases of BSE were notified to the DVFA. One case was rejected by the Veterinary Inspection Unit (VIU) after an assessment of anamnesis and clinical symptoms. Results of the laboratory tests of samples from the second 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 2014-2016 are shown in Table 6.

### Table 5

<table>
<thead>
<tr>
<th>BSE testing in Denmark (periods)</th>
<th>Clinically suspected cases tested</th>
<th>Risk animals tested: emergency-slaughtered animals, fallen stock and AM animals</th>
<th>Healthy slaughter animals tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 July 2001 - 31 Dec. 2008</td>
<td>All (no age limit)</td>
<td>All &gt; 24 months</td>
<td>All &gt; 30 months</td>
</tr>
<tr>
<td>1 Jan. 2009 - 30 June 2011</td>
<td></td>
<td>All &gt; 48 months</td>
<td>All &gt; 48 months</td>
</tr>
<tr>
<td>1 July 2011 - 31 Dec. 2012</td>
<td></td>
<td>All &gt; 48 months</td>
<td>All &gt; 72 months</td>
</tr>
<tr>
<td>1 Jan. 2013 - 3 July 2013</td>
<td></td>
<td>All &gt; 72 months</td>
<td>Random samples &gt; 72 months</td>
</tr>
<tr>
<td>4 July 2013 -</td>
<td></td>
<td>No testing</td>
<td></td>
</tr>
</tbody>
</table>
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. Approximately 2,324 animals were tested in 2016.

Denmark has been recognised as officially free from tuberculosis in bovine herds since 1980.

---

### Table 6

Results of the Danish BSE surveillance programme, 2014-2016

<table>
<thead>
<tr>
<th>Category</th>
<th>2014 Animals tested</th>
<th>2014 Positive animals</th>
<th>2015 Animals tested</th>
<th>2015 Positive animals</th>
<th>2016 Animals tested</th>
<th>2016 Positive animals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fallen stock</td>
<td>20,392</td>
<td>0</td>
<td>18,366</td>
<td>0</td>
<td>19,367</td>
<td>0</td>
</tr>
<tr>
<td>Emergency-slaughtered animals</td>
<td>1,122</td>
<td>0</td>
<td>1,112</td>
<td>0</td>
<td>1,307</td>
<td>0</td>
</tr>
<tr>
<td>AM animals</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Healthy slaughter animals</td>
<td>43</td>
<td>0</td>
<td>33</td>
<td>0</td>
<td>21</td>
<td>0</td>
</tr>
<tr>
<td>Clinical suspects</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21,559</strong></td>
<td><strong>0</strong></td>
<td><strong>19,514</strong></td>
<td><strong>0</strong></td>
<td><strong>20,696</strong></td>
<td><strong>0</strong></td>
</tr>
</tbody>
</table>

Source: The EU TSE database.
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 two Danish cattle herds in 2016. 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 (formerly the Knowledge Centre for Agriculture). The 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 testing of bulk milk samples from dairy herds and blood samples from beef herds for antibodies against BVD. 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 blood samples examined during the period 2014-2016 is 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).

<table>
<thead>
<tr>
<th>Table 7</th>
<th>Bulk milk samples and blood samples examined under the Danish bovine virus diarrhoea surveillance programme, 2014-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year</strong></td>
<td><strong>Herd tested by bulk milk samples</strong></td>
</tr>
<tr>
<td>2014</td>
<td>3,547</td>
</tr>
<tr>
<td>2015</td>
<td>3,419</td>
</tr>
<tr>
<td>2016</td>
<td>3,269</td>
</tr>
</tbody>
</table>

*Source: SEGES.*
In 2016, the DVFA was notified of eight suspected cases of EBL. Three cases were notified due to clinical symptoms. One of these cases was rejected by the Veterinary Inspection Unit (VIU) of the DVFA based on an evaluation of the clinical symptoms. Four cases and one contact herd were suspected due to pathological findings at post-mortem examinations of slaughtered animals. 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.

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 2016, a total of 2,242 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.

The number of bulk milk samples and blood samples examined for IBR during the period 2014-2016 is given in Table 8.

Information pertaining to the OIE-listed cattle diseases is given in Table 9.
In 2016, the DVFA was notified of three suspected cases of IBR. One case was notified due to clinical symptoms, but rejected by the Veterinary Inspection Unit (VIU) of the DVFA based on an evaluation of the clinical symptoms. Two cases were notified because of seropositive test results. 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. 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 blood samples examined for IBR during the period 2014-2016 is given in Table 8.

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

<table>
<thead>
<tr>
<th>Year</th>
<th>Herds tested by bulk milk samples</th>
<th>Blood samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>3,547</td>
<td>9,282</td>
</tr>
<tr>
<td>2015</td>
<td>3,419</td>
<td>15,012</td>
</tr>
<tr>
<td>2016</td>
<td>3,270</td>
<td>15,878</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Disease</th>
<th>Last occurrence in Denmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bovine anaplasmosis*</td>
<td>Never reported</td>
</tr>
<tr>
<td>Bovine babesiosis*</td>
<td>Suspected, but not confirmed</td>
</tr>
<tr>
<td>Bovine genital campylobacteriosis*</td>
<td>1995</td>
</tr>
<tr>
<td>Bovine spongiform encephalopathy (BSE)</td>
<td>2009</td>
</tr>
<tr>
<td>Bovine tuberculosis</td>
<td>1994</td>
</tr>
<tr>
<td>Bovine virus diarrhoea</td>
<td>2016</td>
</tr>
<tr>
<td>Contagious bovine pleuropneumonia</td>
<td>1886</td>
</tr>
<tr>
<td>Enzootic bovine leukemia</td>
<td>1990</td>
</tr>
<tr>
<td>Haemorrhagic septicaemia*</td>
<td>Never reported</td>
</tr>
<tr>
<td>Infectious bovine rhinotracheitis (IBR)/Infectious pustular vulvovaginitis (IPV)</td>
<td>2005</td>
</tr>
<tr>
<td>Lumpy skin disease</td>
<td>Never reported</td>
</tr>
<tr>
<td>Theileriosis*</td>
<td>Never reported</td>
</tr>
<tr>
<td>Trichomonosis*</td>
<td>1990</td>
</tr>
<tr>
<td>Trypanosomosis*</td>
<td>Never reported</td>
</tr>
</tbody>
</table>

* The disease is not notifiable in Denmark.
2.3 Sheep and goat diseases

Classical scrapie has never been reported in Denmark.

In 2016, one case of atypical scrapie was diagnosed in a sheep in Denmark. In general, Denmark saw a few examples of other sheep and goat diseases listed by the OIE in 2016, 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 (formerly the Knowledge Centre for Agriculture). 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 2016, two of 719 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 2016, 2,268 sheep were tested; four tested positive (source: National Veterinary Institute, Technical University of Denmark).
Animal Health in Denmark

2.3 Sheep and goat diseases

[Image of sheep in a grassy field]
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 65,000 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. In 2016, one case of atypical scrapie was diagnosed in a seven-years old sheep 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 65,000 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).
### Table 10
Results of the Danish surveillance programme for TSEs in sheep, 2014-2016

<table>
<thead>
<tr>
<th>Category</th>
<th>2014</th>
<th>2015</th>
<th>2016</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>568</td>
<td>0</td>
<td>661</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>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>569</td>
<td>0</td>
<td>662</td>
</tr>
</tbody>
</table>

Source: The EU TSE database.

### Table 11
Results of the Danish surveillance programme for TSEs in goats, 2014-2016

<table>
<thead>
<tr>
<th>Category</th>
<th>2014</th>
<th>2015</th>
<th>2016</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>133</td>
<td>0</td>
<td>109</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>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>134</td>
<td>0</td>
<td>109</td>
</tr>
</tbody>
</table>

Source: The EU TSE database.
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 has, therefore, been 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).

The results of the surveillance programmes for TSEs in sheep and goats in Denmark in the period 2014-2016 are shown in Tables 10 and 11.
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 Danish 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 2014-2016 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>Enzootic abortion of ewes (ovine chlamydiosis)*</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>Peste des petits ruminants</td>
<td>Never reported</td>
</tr>
<tr>
<td>Salmonellosis (<em>Salmonella abortusovis</em>)</td>
<td>Never reported</td>
</tr>
<tr>
<td>Sheep pox and goat pox</td>
<td>1879</td>
</tr>
<tr>
<td>Transmissible spongiform encephalopathy (classical scrapie)</td>
<td>Never reported</td>
</tr>
</tbody>
</table>

* 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.¹

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 any animals of a herd show 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. As an extra precaution in Denmark, all animals suspected of infection with classical swine fever (CSF) are also routinely considered to be suspected of having ASF.

In 2016, 17 suspected cases of ASF (or CSF) were notified to the Danish veterinary authorities. 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.

Denmark performed a baseline study of the presence of ASF in the Danish pig population in 2011. Blood samples from 3,511 animals were tested for antibodies against ASF. All tested negative. In the autumn of 2013, Denmark initiated a new surveillance programme for ASF. The samples included in this programme were originally collected for other purposes. The testing was performed both on samples selected randomly from the available pool of samples and on targeted samples from the same pool of samples. All samples tested negative for ASF.

¹ Source: Danish Agriculture & Food Council.
In 2013, ASF was approaching the borders of the EU from 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.

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. So far, no further spread of the disease has been recorded in the eastern part of the EU.

In 2016, 287 samples were tested under the Danish surveillance programme for ASF; all samples tested negative. For more information on this surveillance programme, see Box 6.

**Classical swine fever**

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

In 2016, 17 suspected cases of CSF (or ASF) were notified to the Danish Veterinary and Food Administration (DVFA). Nine of them were contact herds of suspected herds. Three cases were suspected due to clinical signs in a pig at the ante-mortem or post-mortem inspection in a slaughterhouse, and five cases were reported due to clinical
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.

On an annual basis, samples from approximately 240 carcasses of swine are tested for ASF and CSF under this programme. In 2016, 287 carcasses were tested; all tested free from ASF and CSF.

Symptoms in animals in herds. Two of these cases were rejected by the 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 two suspected cases, the herds of origin were 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.
Box 7  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/American strains. All samples tested negative. The samples originated from 1,352 sow herds. In statistical terms, it was concluded with 92% certainty that the prevalence of PED virus in Denmark was less than 1% at the end of 2014.

In 2015, the pig farming industry took over the surveillance. In 2016, 718 blood samples were subjected to serological testing and 179 samples to virological testing. All samples tested negative.
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 serological surveillance programme was revised, 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.

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 6.

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 2014-2016 is given in Table 13.

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

<table>
<thead>
<tr>
<th>Year</th>
<th>Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>30,844</td>
</tr>
<tr>
<td>2015</td>
<td>28,399</td>
</tr>
<tr>
<td>2016</td>
<td>41,842</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Disease</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>African swine fever</td>
<td>Never reported</td>
</tr>
<tr>
<td>Classical swine fever</td>
<td>1933</td>
</tr>
<tr>
<td>Nipah virus encephalitis</td>
<td>Never reported</td>
</tr>
<tr>
<td>Porcine cysticercosis</td>
<td>Not reported&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Porcine respiratory and reproductive syndrome (PRRS)</td>
<td>Known to be present&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Transmissible gastroenteritis</td>
<td>Never reported</td>
</tr>
</tbody>
</table>

<sup>1</sup> Year of last outbreak is not known.<br> <sup>2</sup> PRRS is endemic in Denmark.

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 6 on page 47.
Animal Health in Denmark

2.5 Poultry Diseases
2.5 Poultry diseases

The EU-coordinated surveillance programme for avian influenza (AI) in poultry as revised in 2015 continued in 2016.

A highly pathogenic avian influenza (HPAI) H5N8 epidemic started at the end of 2016. A total of 65 dead wild birds were diagnosed with HPAI H5N8 in 2016. Furthermore, a backyard poultry flock was infected with HPAI H5N8 in November 2016. The presence of low pathogenic avian influenza was also detected in two herds with game birds for restocking in the summer of 2016.²

Avian influenza
Highly pathogenic avian influenza H5N8
Wild birds
Several dead wild birds with HPAI H5N8 were detected in Denmark in November and December 2016. The epidemic was not unexpected as the disease had already been diagnosed in wild birds and poultry in Hungary, Germany and other countries in the weeks prior to the occurrence of the disease in Denmark. Restrictions were immediately imposed on all poultry holdings, including backyard flocks and other captured birds to avoid contact with wild birds. Poultry had to be kept inside or fenced under roof. Game birds could, however, be kept in net-covered enclosures. Due to considerations of animal welfare, ducks, geese and ostriches could be kept outside, but should be fed and watered under roof. All fairs, markets, shows and other gatherings of poultry or other captive birds were prohibited.

Due to the epidemic of HPAI H5N8, the passive surveillance in wild birds was expanded significantly at the end of 2016. A total of 204 dead wild birds were submitted for laboratory examination in 2016, most of them in November and December. The

² Source: 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.
Danish Veterinary and Food Administration (DVFA) used the media to increase the awareness among the general public of the essence of reporting dead wild birds. The Danish Emergency Management Agency assisted with the collection and submission of dead birds based on reports from the public. 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 65 wild dead birds were detected with HPAI H5N8 (see Figure 1). Most infected birds were tufted ducks (43%), great black-backed gulls (14%), swans (14%) and birds of prey (14%) (see Table 15).

### Backyard flock of poultry

A backyard flock situated in Aalsgaarde, in the municipality of Helsingør in the north eastern part of Zealand suffering from clinical disease and increased mortality was diagnosed with HPAI H5N8 on 21 November 2016. This was the first outbreak of HPAI recorded in Denmark since 2006.

The flock comprised 69 animals: 35 ducks, 16 geese, 5 turkeys and 13 hens. Only the ducks revealed clinical symptoms of avian influenza. Except for the ducks, the poultry were kept under roof. The source of infection was probably direct or indirect contact with wild birds from a nearby wetland area or from the sea. Movement restrictions were immediately imposed on the infected holding, and the disease had been stamped out at the location by 21 November 2016. On 22 November 2016, the local Veterinary Inspection Unit approved the preliminary cleaning and disinfection of the facilities.

<table>
<thead>
<tr>
<th>Species</th>
<th>Positive birds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accipitridae</td>
<td>9</td>
</tr>
<tr>
<td>Common buzzard</td>
<td>5</td>
</tr>
<tr>
<td>Northern goshawk</td>
<td>1</td>
</tr>
<tr>
<td>White-tailed eagle</td>
<td>3</td>
</tr>
<tr>
<td>Anatidae</td>
<td>38</td>
</tr>
<tr>
<td>Common eider</td>
<td>1</td>
</tr>
<tr>
<td>Mute swan</td>
<td>8</td>
</tr>
<tr>
<td>Tufted duck</td>
<td>28</td>
</tr>
<tr>
<td>Whooper swan</td>
<td>1</td>
</tr>
<tr>
<td>Corvidae</td>
<td>1</td>
</tr>
<tr>
<td>Common raven</td>
<td>1</td>
</tr>
<tr>
<td>Laridae</td>
<td>17</td>
</tr>
<tr>
<td>Black-headed gull</td>
<td>1</td>
</tr>
<tr>
<td>Great black-backed gull</td>
<td>9</td>
</tr>
<tr>
<td>Herring gull</td>
<td>4</td>
</tr>
<tr>
<td>Mew gull</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
</tr>
</tbody>
</table>

Table 15

HPAI H5N8 in dead wild birds by species in 2016
Figure 1
Dead wild birds tested for avian influenza in 2016

Note that dead birds found in close geographical and temporal proximity of each other are only represented on the map by one dot.
A 3 km protection zone and a 10 km surveillance zone around the holding were put in place in accordance with Council Directive 2005/94/EC.

All restrictions were lifted on 22 December 2016 following extensive screening of poultry within the two zones. This outbreak did not cause any secondary outbreaks.

**Low pathogenic avian influenza**

Low pathogenic avian influenza (LPAI H5N2 and LPAI H7N7) was diagnosed in two herds with game birds for restocking (mallard ducklings) in July and August 2016. The mallard ducklings were tested in accordance with the Danish surveillance programme for avian influenza in poultry and game birds for restocking by routine sampling of offspring from mallards. All birds in the two flocks were killed, and the farms were cleaned and disinfected.

A 1 km restriction zone around each holding was put in place immediately when the ducklings had tested positive to take the necessary measures in accordance with Council Directive 2005/94/EC. In both cases, the most likely infection route was direct or indirect contact with wild birds.

**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 culling 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.

Low pathogenic avian influenza was diagnosed in two herds with game birds for restocking in July and August 2016.
Box 8 Early warning scheme - a supplement to the surveillance of avian influenza

EU surveillance programmes for avian influenza (AI) in poultry and wild birds have been in place in Denmark since 2003. As a supplement to these programmes, a special programme for early warning 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.

Twenty early warnings of AI were notified to the DVFA in 2016. All samples tested free from AI and ND.
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 gamebirds. Additionally, PCR testing is used in case of a positive serological result to confirm whether the relevant flock is infected by a virus.

In total, eight holdings/flocks tested positive in a serological test in 2016. However, PCR testing showed no circulation of virus in the poultry.

As mentioned above, two flocks of game birds for restocking (mallard ducklings) tested positive for LPAI under the virological surveillance programme. Results from the serological surveillance programme are shown in Table 16.

If poultry show clinical signs of AI, official restrictions are imposed on the farm while an epidemiological investigation of the flock is carried out and laboratory testing is conducted. Sixteen clinical cases were notified to the Danish Veterinary and
Table 16
Results of the Danish serological surveillance programme for avian influenza in poultry and game birds for restocking, 2016

<table>
<thead>
<tr>
<th>Poultry category</th>
<th>Holdings (h)/flocks (f) in Denmark(^1)</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>12 (f)(^2)</td>
<td>0 0 0</td>
<td>0 0</td>
</tr>
<tr>
<td>Chicken breeders</td>
<td>153 (f)</td>
<td>111 (f)(^2)</td>
<td>0 0 0</td>
<td>0 0</td>
</tr>
<tr>
<td>Free-range laying hens</td>
<td>141 (f)</td>
<td>124 (f)(^2)</td>
<td>1(^1) 2</td>
<td>0 0</td>
</tr>
<tr>
<td>Free-range broilers</td>
<td>21 (h)</td>
<td>11 (h)(^2)</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)(^2)</td>
<td>0 0 0</td>
<td>- -</td>
</tr>
<tr>
<td>Fattening ducks</td>
<td>73 (h)</td>
<td>17 (h)(^2)</td>
<td>0 0 0</td>
<td>- -</td>
</tr>
<tr>
<td>Mallards bred for restocking of game birds</td>
<td>19 (h)</td>
<td>8 (h)</td>
<td>4 1 0</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</td>
<td>64 (h)</td>
<td>26 (h)</td>
<td>0 0 0</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>5 3 0</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.

\(^3\) The same flock reacted serologically positive three times in 2016.
In total, 241 samples from 204 birds were tested under the passive surveillance programme; 65 dead wild birds were positive for HPAI H5N8.

Food Administration (DVFA) in 2016. One tested positive for HPAI H5N8 (see “Backyard flock of poultry” on page 52).

The surveillance programme for avian influenza in wild birds
Since January 2011, the surveillance programme for avian influenza in wild birds has been divided into an EU-coordinated passive surveillance programme for HPAI in wild birds found dead or sick and national active surveillance for AI in live birds with an increased risk of exposure to AI and hunted game birds. Birds sourced from passive surveillance are tested individually, and birds sourced from active surveillance are tested by cloacal swabs in pools taken from up to five birds of the same species at the same time and location. As mentioned above, the passive surveillance of dead wild birds was expanded significantly at the end of 2016 due to the epidemic of HPAI H5N8. In total, 241 samples from 204 birds were tested under the passive surveillance programme; 65 dead wild birds were positive for HPAI H5N8. During the period of active surveillance for AI in wild birds, 243 pools of cloacal swabs were analysed; none of the live wild birds were positive for HPAI H5N8. Results are displayed in Table 17.

None of the live wild birds were positive for HPAI H5N8. Results are displayed in Table 17.
Animal Health in Denmark

2.5 Poultry Diseases

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 ND, official restrictions are imposed on the farm while an epidemiological investigation of the flock is carried out and laboratory testing is conducted. In 2016, 16 suspected cases of clinical avian influenza were notified to the DVFA. The laboratory testing of the suspected cases also included a test for ND. However, all samples collected from the suspected flocks tested free from both AI and ND.

All 20 early warnings for avian influenza in 2016 were also tested for ND. All samples tested free from ND.

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

### Table 17
Results of the Danish surveillance programme for avian influenza in wild birds, 2016

<table>
<thead>
<tr>
<th></th>
<th>Passive surveillance (dead or sick wild birds)</th>
<th>Active surveillance (live wild birds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birds sampled</td>
<td>204</td>
<td>921</td>
</tr>
<tr>
<td>Samples/pools</td>
<td>241 samples</td>
<td>243 pools*</td>
</tr>
<tr>
<td>Influenza A-positive birds</td>
<td>66</td>
<td>50 pools*</td>
</tr>
<tr>
<td>LPAI H5-positive birds</td>
<td>0</td>
<td>12 pools*</td>
</tr>
<tr>
<td>LPAI H7-positive birds</td>
<td>0</td>
<td>1 pool*</td>
</tr>
<tr>
<td>HPAI H5/H7-positive birds</td>
<td>65</td>
<td>0</td>
</tr>
</tbody>
</table>

* Pools of cloacal swabs taken from up to five birds of the same species at the same time and location. The actual number of positive birds is not known, but at least one positive bird will give a positive pool.

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, 2014-2016

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Avian chlamydiosis*</td>
<td>8</td>
<td>34</td>
<td>11</td>
</tr>
<tr>
<td>Avian infectious laryngotracheitis*</td>
<td>5</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Avian influenza (low pathogenic)</td>
<td>1</td>
<td>(2013)</td>
<td>2</td>
</tr>
</tbody>
</table>

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

* Occurrence mainly in ornamental, hobby and backyard birds.

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

<table>
<thead>
<tr>
<th>Disease</th>
<th>Year of Last Occurrence</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.
Animal Health in Denmark

2.6 Equine diseases
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 2016. The case was reported due to clinical signs in two horses. Official restrictions were imposed on the herd under suspicion while laboratory testing was conducted; however, the samples tested negative for dourine.
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. The Danish Veterinary and Food Administration was notified of one suspected case of EIA in 2016. The case was reported due to clinical signs in two horses. Official restrictions were imposed on the herd under suspicion while laboratory testing was conducted. Both samples tested negative for EIA.

### 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**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Last Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>African horse sickness</td>
<td>Never reported</td>
</tr>
<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 confirmed¹</td>
</tr>
<tr>
<td>Equine piroplasmosis*</td>
<td>Not reported²</td>
</tr>
<tr>
<td>Equine viral arteritis</td>
<td>Suspected, but not confirmed</td>
</tr>
<tr>
<td>Glanders</td>
<td>1928</td>
</tr>
<tr>
<td>Infection with equid herpesvirus-1 (EHV-1)*</td>
<td>2013</td>
</tr>
<tr>
<td>Venezuelan equine encephalomyelitis</td>
<td>Never reported</td>
</tr>
</tbody>
</table>

¹ The disease is not notifiable in Denmark.

² Year of last outbreak is not known.

---
2.7 Fur animal diseases

In 2016, 1,528 mink farms were registered in Denmark, the annual production of skins exceeding 15 million.

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 250,000 fur animals in 2016.
**Myxomatosis**

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

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

**Rabbit haemorrhagic disease**

In 2016, rabbit haemorrhagic disease (RHD) was diagnosed on five Danish rabbit farms where several rabbits had died. RHD was also reported in wild rabbits at two different locations in Denmark. The wild population is considered a reservoir for the disease.

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

**Infection with distemper virus**

Distemper occurs sporadically on Danish mink farms, and all farms are comprised by a national distemper control programme. Distemper virus has been found many times in wildlife species that are considered to be the reservoir. Many mink farmers vaccinate against distemper to prevent infection.

**Aleutian disease (mink plasmacytosis)**

The Danish control programme for Aleutian disease set up by the Danish Fur Breeders’ Association divides the country into two zones. A restricted zone has been put in place in the northern part of Jutland north of the Limfjord, in which frequent outbreaks occur. Only a small number of outbreaks occurred outside the restricted zone in 2016. As set out in the control programme, the infected herds were culled, and the farms were cleaned and disinfected.

(Source: Kopenhagen Fur (owned by the Danish Fur Breeders’ Association))

Many mink farmers vaccinate against distemper to prevent infection.
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 increased mortality, routine inspections and laboratory examination of surveillance samples.

In 2016, the Danish Veterinary and Food Administration (DVFA) carried out 196 inspections of fish farms. The number of surveillance samples (including export samples) tested in 2016 is presented in Table 21.

Each sample tested is a pooled sample of up to ten fish. The species tested are mainly rainbow trout, which constitute 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 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 tissues sampled and the testing methods are also specified in Table 21.

In 2016, 237 aquaculture production businesses (APBs) producing salmonids were registered in Denmark. The majority were freshwater fish farms, but 22 of the 237 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 number of surveillance samples tested in 2016 is presented in Table 21.

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

2.7 Fish diseases
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).

In 2010, ISA virus HPR0 (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 HPR0 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.

### Table 21
Number of surveillance samples (including export samples) tested under the Danish agricultural surveillance programme in 2016

<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>105</td>
</tr>
<tr>
<td>Infectious haematopoietic necrosis</td>
<td>1</td>
<td>A</td>
<td>633</td>
</tr>
<tr>
<td>Infection with HPR-deleted or HPR0 infectious salmon anaemia virus</td>
<td>2</td>
<td>B</td>
<td>234</td>
</tr>
<tr>
<td>Infection with salmonid alphavirus</td>
<td>1</td>
<td>A</td>
<td>226</td>
</tr>
<tr>
<td>Spring viraemia of carp</td>
<td>1</td>
<td>A</td>
<td>108</td>
</tr>
<tr>
<td>Viral haemorrhagic septicaemia</td>
<td>1</td>
<td>A</td>
<td>633</td>
</tr>
</tbody>
</table>

* Each sample tested is a pooled sample of up to ten fish per sample

1: Kidney, spleen and heart (and in some cases brain).
2: Same tissues as in sample type 1 + gills.

A: Cultivation in cell culture followed by observation of cytopathic effect.
B: PCR test.
**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 2016, KHV was detected in a private garden pond located near the town of Høng in the municipality of Kalundborg on Zealand.

**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).

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

<table>
<thead>
<tr>
<th>Disease</th>
<th>Last Occurrence</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epizootic haematopoietic necrosis disease</td>
<td>Never reported</td>
<td></td>
</tr>
<tr>
<td>Infection with <em>Aphanomyces invadans</em> (epizootic ulcerative syndrome)</td>
<td>Never reported</td>
<td></td>
</tr>
<tr>
<td>Infection with <em>Gyrodactylus salaris</em></td>
<td>Suspected, but not confirmed</td>
<td></td>
</tr>
<tr>
<td>Infection with salmonid alphavirus*</td>
<td>Never reported</td>
<td></td>
</tr>
<tr>
<td>Infectious haematopoietic necrosis</td>
<td>Never reported</td>
<td></td>
</tr>
<tr>
<td>Infection with HPR-deleted or HPR0 infectious salmon anaemia virus</td>
<td>Never reported</td>
<td></td>
</tr>
<tr>
<td>Koi herpesvirus disease</td>
<td>2016¹</td>
<td>The infection was detected in a private garden pond.</td>
</tr>
<tr>
<td>Red sea bream iridoviral disease*</td>
<td>Never reported</td>
<td></td>
</tr>
<tr>
<td>Spring viraemia of carp</td>
<td>2003¹</td>
<td></td>
</tr>
<tr>
<td>Viral haemorrhagic septicaemia</td>
<td>2009</td>
<td></td>
</tr>
</tbody>
</table>

¹ The disease is not notifiable in Denmark.
Animal Health in Denmark

2.9 Mollusc diseases
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 June and October-November 2015.

In 2016, *B. ostreae* continued to be detected in samples from the affected areas. In samples collected in December 2016 due to increased mortality, the prevalence of *B. ostreae* in the samples was 5%.

The source of the infection is unknown. Flat oysters have not been officially imported to the area since 1980. The people engaged in oyster and mussel fishery in the Limfjord area are normally fully aware of all activities – both official and unofficial – and interviews of those persons do not suggest any illegal import of flat oysters for relay.

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 is continued in Nissum Bredning, the most western part of the Limfjord, because *B. ostreae* has not yet been detected in this area.
Infection with *Marteilia 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.

A declaration of the Danish disease-free status (category I) for *Marteilia refringens* in Nissum Bredning was submitted to the EU in September 2016.

<table>
<thead>
<tr>
<th>Infection</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection with abalone herpesvirus*¹</td>
<td>Not reported²</td>
</tr>
<tr>
<td>Infection with <em>Bonamia exitiosa</em>¹</td>
<td>Never reported</td>
</tr>
<tr>
<td>Infection with <em>Bonamia ostreae</em></td>
<td>Disease present</td>
</tr>
<tr>
<td>Infection with <em>Marteilia refringens</em></td>
<td>Never reported</td>
</tr>
<tr>
<td>Infection with <em>Perkinsus marinus</em></td>
<td>Never reported</td>
</tr>
<tr>
<td>Infection with <em>Perkinsus olseni</em></td>
<td>Never reported</td>
</tr>
<tr>
<td>Infection with <em>Xenohaliotis californiensis</em>¹</td>
<td>Never reported</td>
</tr>
</tbody>
</table>

* The disease is not notifiable in Denmark.
¹ Host is not present in Denmark.
² Year of last outbreak is not known.
Animal Health in Denmark

2.9 Mollusc diseases
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.³

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 2016.

Table 24
Animal by-products produced in Denmark in 2016

<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>33,554</td>
<td>132,001</td>
<td>340,158</td>
</tr>
<tr>
<td>Fallen stock</td>
<td>21,346</td>
<td>103,534</td>
<td>None</td>
</tr>
</tbody>
</table>

## 4. Livestock statistics

### Table 25
Livestock population. Herds/flocks and animals in Denmark, 2014-2016

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cattle</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animals</td>
<td>1,556,307</td>
<td>1,560,289</td>
<td>1,567,213</td>
</tr>
<tr>
<td>Herds</td>
<td>19,460</td>
<td>18,002</td>
<td>17,576</td>
</tr>
<tr>
<td><strong>Sheep</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animals</td>
<td>142,926</td>
<td>142,354</td>
<td>148,226</td>
</tr>
<tr>
<td>Herds</td>
<td>7,010</td>
<td>6,861</td>
<td>6,687</td>
</tr>
<tr>
<td><strong>Goats</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animals</td>
<td>20,828</td>
<td>20,600</td>
<td>20,082</td>
</tr>
<tr>
<td>Herds</td>
<td>3,144</td>
<td>3,071</td>
<td>2,997</td>
</tr>
<tr>
<td><strong>Horses</strong></td>
<td>200,000*</td>
<td>170,000*</td>
<td>170,000*</td>
</tr>
<tr>
<td>Herds</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>14,925</td>
<td>14,983</td>
<td>14,852</td>
</tr>
<tr>
<td>Herds</td>
<td>539</td>
<td>514</td>
<td>502</td>
</tr>
<tr>
<td><strong>Pigs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animals</td>
<td>13,279,122</td>
<td>13,390,751</td>
<td>13,384,992</td>
</tr>
<tr>
<td>Herds</td>
<td>8,917</td>
<td>8,675</td>
<td>8,707</td>
</tr>
<tr>
<td><strong>Poultry</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animals</td>
<td>27,904,213</td>
<td>29,570,001</td>
<td>33,817,550</td>
</tr>
<tr>
<td>Flocks</td>
<td>1,046</td>
<td>1,239</td>
<td>1,320</td>
</tr>
</tbody>
</table>

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

* Estimate based on the number of horse passports issued.
### Table 26
Animals imported from the EU and third countries to Denmark, 2014-2016

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horses¹</td>
<td>2,170</td>
<td>2,645</td>
<td>3,351</td>
</tr>
<tr>
<td>Cattle²</td>
<td>350</td>
<td>165</td>
<td>137</td>
</tr>
<tr>
<td>Pigs</td>
<td>93</td>
<td>675</td>
<td>330³</td>
</tr>
<tr>
<td>Sheep/goats</td>
<td>151</td>
<td>249</td>
<td>4,215⁶</td>
</tr>
<tr>
<td>Poultry³</td>
<td>3,030,025</td>
<td>3,852,016</td>
<td>6,788,262⁷</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 chicken.

### Table 27
Animals exported from Denmark to the EU and third countries, 2014-2016

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horses¹</td>
<td>1,338</td>
<td>1,078</td>
<td>730</td>
</tr>
<tr>
<td>Cattle²</td>
<td>83,596</td>
<td>62,722</td>
<td>57,113</td>
</tr>
<tr>
<td>Pigs</td>
<td>11,270,253</td>
<td>12,463,855</td>
<td>13,421,804</td>
</tr>
<tr>
<td>Sheep/goats</td>
<td>1,857</td>
<td>1,710</td>
<td>1,413</td>
</tr>
<tr>
<td>Poultry³</td>
<td>49,494,644</td>
<td>55,087,210</td>
<td>57,457,138</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.
4. Livestock statistics
5. Index of diseases

A
African horse sickness, 14, 65
African swine fever, 11, 14, 15, 16, 44-47, 49
Aleutian disease (mink plasmacytosis), 69
Anthrax, 28
Aujeszky’s disease, 15, 20, 28, 48
Avian chlamydiosis, 61
Avian infectious bronchitis, 61
Avian infectious laryngotracheitis, 61
Avian influenza, 14, 16
Avian influenza (highly pathogenic), 19, 51-54, 55, 58, 59, 60, 61
Avian influenza (low pathogenic), 51, 54-59, 61
Avian mycoplasmosis (Mycoplasma gallisepticum), 61
Avian mycoplasmosis (Mycoplasma synoviae), 61

B
Bluetongue, 14, 15, 22, 28
Bovine anaplasmosis, 37
Bovine babesiosis, 37
Bovine genital campylobacteriosis, 37
Bovine spongiform encephalopathy (BSE), 14, 19, 31-33, 34, 37
Bovine tuberculosis, 31, 34-35, 37
Bovine virus diarrhoea, 35, 37
Brucellosis, 11, 14, 20, 22, 24, 28

C
Caprine arthritis/encephalitis, 38, 43
Classical swine fever, 11, 14, 44, 46-49
Contagious agalactia, 43
Contagious bovine pleuropneumonia, 37
Contagious caprine pleuropneumonia, 43
Contagious equine metritis, 63, 65
Crimean Congo haemorrhagic fever, 28

D
Dourine, 63, 65
Duck virus hepatitis, 61

E
_Echinococcus granulosus_, 28
_Echinococcus multilocularis_, 28
Enzootic abortion of ewes (ovine chlamydiosis), 43
Enzootic bovine leucosis, 14, 31, 35, 37
Epizootic haematopoietic necrosis disease, 72, 73
Epizootic haemorrhagic disease, 14, 28
Equine encephalomyelitis (Eastern), 28
Equine encephalomyelitis (Western), 65
Equine infectious anaemia, 64, 65
Equine influenza, 65
Equine piroplasmosis, 65
Equine viral arteritis, 63, 65
F
Foot and mouth disease, 7, 14, 15, 20, 25, 28
Fowl typhoid, 61

G
Glanders, 65

H
Haemorrhagic septicaemia, 37
Heartwater, 28

I
Infection with abalone herpesvirus, 76
Infection with *Aphanomyces invadans* (epizootic ulcerative syndrome), 73
Infection with *Bonamia exitiosa*, 76
Infection with *Bonamia ostreae*, 75, 76
Infection with distemper virus, 69
Infection with equid herpesvirus-1 (EHV-1), 65
Infection with *Gyrodactylus salaris*, 73
Infection with HPR-deleted or HPRO infectious salmon anaemia virus, 72, 73
Infection with *Marteilia refringens*, 76
Infection with *Perkinsus marinus*, 76
Infection with *Perkinsus olseni*, 76
Infection with salmonid alphavirus, 72, 73

J
Japanese encephalitis, 28

K
Koi herpesvirus disease, 73

L
Lumpy skin disease, 14, 37

M
Maedi-visna, 38, 43
Myxomatosis, 68

N
Nairobi sheep disease, 43
New World screwworm (*Cochliomyia hominivorax*), 28
Newcastle disease, 14, 55, 60, 61
Nipah virus encephalitis, 49
O

Old World screwworm (*Chrysomya bezziana*), 28
Ovine epididymitis (*Brucella ovis*), 43

P

Paratuberculosis, 28
Peste des petits ruminants, 14, 43
Porcine cysticercosis, 49
Porcine epidemic diarrhoea (PED) virus, 11, 48
Porcine respiratory and reproductive syndrome (PRRS), 49
Pullorum disease, 61

Q

Q fever, 28

R

Rabbit haemorrhagic disease, 68
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