



2006

ANIMAL HEALTH

in Denmark

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



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PREFACE

I am delighted to present the Annual Report on Animal Health in Denmark 2006.

The Report provides a comprehensive overview of developments in the field of animal health in 2006.

The Annual Report includes statistical information and overview of surveillance that may be useful for reference purposes as well as details on the following three main topics:

- Avian influenza, as Denmark, like many other European countries, experienced an epidemic in wild birds in 2006;
- Atypical scrapie, which was found in three Danish sheep in 2006; and
- Bovine virus diarrhoea, which is almost eradicated as a result of a successful eradication campaign.

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

Birgit Hendriksen

Deputy Chief Veterinary Officer
Head of the Animal Health Division



1
LIVESTOCK
DISEASE
STATUS

The health status of Danish livestock has continued to improve in 2006.

The major disease event in 2006 was the detection of highly pathogenic avian influenza H5N1. Infected wild birds were found from 14 March to 29 May 2006, mainly along the coast line of the Baltic Sea and in shallow areas of the inner Danish waters. The epidemic in wild birds started in February on the German island of Rügen and then spread to the coastal areas of Sweden and Denmark as well as to Poland. After May 2006, the infection seemed to die out. Furthermore, the first and only Danish case of highly pathogenic avian influenza H5N1 in poultry was found in a backyard flock on 18 May 2006. The source of infection was probably wild birds. The infection was successfully eradicated, and no further cases were found in poultry.

In 2006, three cases of atypical scrapie were diagnosed in Denmark. This was the first time atypical scrapie was detected in Denmark.

Denmark is in the very final stage of the successful eradication of bovine virus diarrhoea (BVD).

No cases of bovine spongiform encephalopathy (BSE) were diagnosed in Denmark in 2006.

Information on the Danish strategies for prevention and control of animal diseases is available on the website of the Danish Veterinary and Food Administration: www.dvfa.dk.



1.1

MULTIPLE SPECIES DISEASES

Aujeszky's disease has not occurred in Denmark for more than a decade. Denmark has been officially free of brucellosis in cattle since 1979, and the disease has not been diagnosed in cattle since 1962. Denmark is also officially free of disease caused by *Brucella melitensis*, which has never been recorded in Denmark. Sylvatic rabies has not been recorded in Denmark since March 1982. European bat lyssavirus (EBLV – bat rabies) continues to be diagnosed in a few bats almost every year, and antibodies were detected in a wild fox in 2006. The only other multiple species diseases listed by the OIE that have occurred in Denmark in 2006 were paratuberculosis, Q fever and leptospirosis.

AUJESZKY'S DISEASE

Aujeszky's disease has not occurred in Denmark since 1991. The Aujeszky's disease control and eradication programme was described in the 1989 and 1992 editions of this publication.

The sampling strategy of the Aujeszky's disease surveillance programme was revised in December 2005. In the new sampling strategy, blood samples from 3.5% of boars with a live weight of more than 140 kg and 3.5% of all sows are tested before slaughter or export. The number of blood samples examined in the period 2004-2006 is given in Table 1.

Table 1: Number of blood samples examined under the Danish Aujeszky's disease surveillance programme, 2004-2006

YEAR	NUMBER OF SAMPLES
2004	59,706
2005	48,707
2006	43,941

BRUCELLOSIS

Since 1979, Denmark has been officially free of bovine brucellosis by the European Union (Commission Decision 2004/320/EC). The official eradication programme for bovine brucellosis began in 1948, and all cattle herds were identified as free of brucellosis in 1959. Bovine brucellosis has not occurred in Denmark since 1962.

Brucellosis has not been detected in pigs since 1999 when *Brucella suis* biotype 2 was diagnosed in a herd of free-range pigs. The herd had probably been infected by transmission of *Brucella suis* biotype 2 from European brown hares in the area. All boars at artificial insemination centres are regularly tested according to Council Directive 90/429/EC.

Caprine and ovine brucellosis (*Brucella melitensis*) has never been recorded in Denmark, and since 1995, Denmark has been recognised as being officially free of *Brucella melitensis* by the European Union (Commission Decision 94/877/EC). A serological surveillance programme for demonstrating the absence of *B. melitensis* is carried out by testing blood samples collected in the voluntary control programme for Maedi-visna. The number of blood samples examined in the period 2004-2006 is presented in Table 2.

Table 2: Number of blood samples examined under the Danish *Brucella melitensis* surveillance programme, 2004-2006

Year	Number of blood samples
2004	4,588
2005	4,492
2006	3,826

FOOT AND MOUTH DISEASE (FMD)

Foot and mouth disease has not occurred in Denmark since 1983, and Denmark is recognised by the OIE as an FMD-free country where vaccination is not practised.

In 2006, three clinically suspected cases of FMD were notified to the authorities. The Animal Health Unit of the Regional Veterinary and Food Administration Centres dismissed all three suspicions after a thorough evaluation.

RABIES

Sylvatic rabies has not been recorded in Denmark since March 1982. However, in September 1985, bat rabies, European bat lyssavirus (EBLV), was diagnosed for the first time in Denmark. The occurrence of bat rabies has been monitored since then. This monitoring is based on dead bats submitted for examination. EBLV was diagnosed in 10 bats in Denmark in 2006.

TRICHINELLOSIS

No trichinellosis infections have been reported in domestic animals since 1930. The Danish surveillance programme for demonstrating the absence of *Trichinella spp.* infections in domestic animals consists of an examination of meat samples from all pigs and horses slaughtered at Danish export-approved slaughterhouses. The number of samples examined in the period 2004-2006 appears from Table 3.

Table 3: Number of meat samples examined under the Danish trichinellosis surveillance programme, 2004-2006

Year	Number of meat samples from pigs	Number of meat samples from farmed wild boars	Number of meat samples from horses
2004	24,945,030	1,141	1,278
2005	22,147,738	1,552	1,476
2006	21,106,788	1,324	1,272

Information pertaining to other multiple species diseases is listed in Table 4.

Table 4: The year when other multiple species diseases listed by the OIE were last reported in Denmark

Anthrax	1988
Bluetongue	Never recorded
Crimean Congo haemorrhagic fever*	Never recorded
Echinococcosis/hydatidosis	1996
Heartwater*	Never recorded
Japanese encephalitis	Never recorded
Leptospirosis	Serological indication ¹⁾
Paratuberculosis*	Known to be present ²⁾
Q fever	Reported present
Rift Valley fever	Never recorded
Rinderpest	1782
Screwworm*	Never recorded
Tularemia	Never recorded
Vesicular stomatitis	Never recorded
West Nile fever	Never recorded

* The disease is not notifiable in Denmark.

¹⁾ Serological examinations of bovine and porcine sera indicate a low incidence of leptospirosis.

²⁾ The disease is not officially controlled; however, since 1979 it has been possible for owners of cattle herds with clinical problems to use vaccination, subject to permission by the Veterinary Service.



1.2 CATTLE DISEASES

Denmark is in the final stage of a successful eradication campaign against bovine virus diarrhoea (BVD). No cases of bovine spongiform encephalopathy (BSE) were detected in Denmark in 2006, and Denmark can now be considered a low BSE incidence country. Denmark is officially free of tuberculosis, infectious bovine rhinotracheitis (IBR) and enzootic bovine leucosis by the European Union.

BOVINE VIRUS DIARRHOEA (BVD)

Bovine virus diarrhoea or BVD is an infectious disease in cloven-hoofed animals. If a cow is infected during the first three months of the pregnancy, the calf may be born as a persistently infected animal, a PI animal. PI animals have an immune system that tolerates the BVD virus. PI animals are able to infect other animals throughout their lives and are therefore the main target of control and eradication programmes.

In 1994, a voluntary control and eradication programme for BVD was implemented. The programme was designed by the Danish Cattle Federation and launched in 1992 when all cattle herds on the island of Samsø were tested. Blood samples were taken of all animals above three months of age. They were examined for the BVD virus and antibodies using two newly developed ELISA methods. On the islands of Bornholm and Mors, another project with the aim of evaluating a tank milk antibody test in order to assess the herd infection status was also initiated in 1992.

The results were encouraging, and in 1994 the Danish Cattle Federation decided to examine all Danish dairy herds by bulk milk tests. Herds identified as seropositive were encouraged to test and cull all PI animals and only purchase BVD-free animals.

In 1996, a compulsory programme carried out by the Danish Cattle Federation in collaboration with the Danish Veterinary and Food Administration replaced the voluntary programme. Legislation has been continuously adjusted alongside the progress of the BVD programme – revisions were made in 1996, 1997, 1999 (twice), 2001, 2002, 2004 and 2006.

The Danish Veterinary and Food Administration set up the legal framework for the BVD eradication programme, and the Danish Cattle Federation paid the laboratory costs and compensation to the herd owners if they slaughtered PI animals.

The primary measures of the eradication programme were the culling of PI animals and movement restrictions on animals.

Initially the herds were classified at three BVD risk levels based on the test results of three blood samples per year from all beef herds or on bulk milk samples four times per year for dairy herds. In high-risk herds, the identification of PI animals was attempted by further tests.

Only cattle with a negative virus test could be moved. This was assured by requiring a health certificate to accompany every animal moved. The movement restrictions were implemented by blocking the issuing of health certificates pertaining to virus positive animals or antibody positive pregnant cows from the Central Husbandry Register (CHR). Furthermore, the affected herd owners were required to quarantine PI animals in separate facilities away from other animals on the farm.

In 1999, the eradication and control programme had reached the point where it was possible to define a BVD-free herd as a herd without PI animals or potentially infected pregnant cows, and where the BVD seronegative herd status had been confirmed for the last 12 months. From BVD-free herds, animals could be moved without being individually tested for virus. As regards herds having a non-BVD-free status (all other than BVD-free herds), the conditions were constantly tightened, i.e., at one point in time, compulsory testing of calves before they were five months old was introduced and the movement of cattle older than 12 months to other farms was prohibited.

In 2004, the on-farm testing of animals in beef herds was replaced by sampling of slaughtered animals. If less than three animals had been sampled at slaughter within one year, additional on-farm sampling was required if the herd owner wanted to move cattle to other farms.

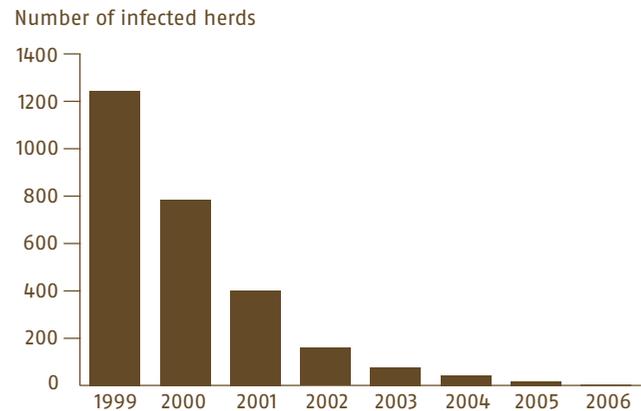
In 2006, 13 herds remained restricted as BVD infected herds (Figure 1). It was then decided to discontinue the BVD herd status testing programme and replace it by a national BVD surveillance programme, while keeping the remaining infected herds under movement restrictions.

The BVD surveillance programme still exists as part of the bovine disease surveillance programme for BVD and IBR. Bulk milk samples from all dairy herds are tested four times a year. If livestock is imported for a herd, bulk milk samples are tested for six consecutive months. All beef herds are tested by having one blood sample taken from their slaughtered animals every month, if possible. Beef herds for which cattle have been imported within the last six months will automatically have two animals tested by blood samples at slaughter.

Teams of veterinary experts at the Danish Cattle Federation are supervising the surveillance programme. If they notice an increase in the antibody titres or find other unexpected results, they perform an investigation of the matter. Every month in 2006, few herds have been placed under restriction due to unexpected test results. Subsequently they were all investigated by follow-up testing to confirm or reject the suspicion. PI animals must be isolated.

At the end of 2006, only five herds were still infected with the BVD virus and remained subject to restrictions.

Figure 1: The number of Danish herds infected with bovine virus diarrhoea, 1999-2006



BOVINE SPONGIFORM ENCEPHALOPATHY (BSE)

Denmark is now a low BSE incidence country. This conclusion is based on the results of an extensive active surveillance programme with nearly two million tests in the period 2001-2006. No cases of BSE were detected in 2006 (Table 5).

Denmark has implemented the TSE legislation laid down by the European Commission in Commission Regulation 999/2001/EC as amended.

The Danish surveillance programme is in accordance with Commission Regulation 999/2001/EC and comprises:

- All healthy slaughter animals older than 30 months.
- All fallen stock, all emergency-slaughtered animals and all animals with observations during ante-mortem inspection at slaughter (AM animals) older than 24 months.

In case of a positive or inconclusive result of the rapid test, BSE is suspected and the Danish Veterinary Institute further investigates the test material from the animal. Meanwhile, the herd of origin is placed under movement restriction. 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 is also destroyed as SRM (one carcass upstream – two carcasses downstream).

Table 5: Results of the Danish BSE surveillance programme, 2004-2006

Category	2004		2005		2006	
	Negative	Positive	Negative	Positive	Negative	Positive
Fallen stock	36,163	1	36,224	1	38,310	0
Emergency slaughter	1,803	0	2,024	0	1,747	0
AM animals	7	0	9	0	5	0
Healthy slaughter animals	246,156	0	216,687	0	200,962	0
Animals from BSE- positive herds or UK animals	95	0	6	0	3	0
Clinical suspects	18	0	11	0	4	0
Total	284,242	1	254,961	1	241,031	0

A prognosis model from the National Veterinary Institute estimates that no further cases of BSE will be found in the period 2007-2010.

BOVINE TUBERCULOSIS

Since 1980, Denmark has been officially free of bovine tuberculosis by the European Union (Commission Decision 2004/320/EC).

The eradication of bovine tuberculosis in Denmark was initiated already in 1893. A surveillance programme replaced the eradication programme in 1959 due to the fact that the eradication was so advanced that only a few outbreaks were detected each year.

The Danish surveillance programme demonstrating the absence of tuberculosis in cattle consists in post-mortem examinations in connection with meat inspections and tuberculin tests of selected animal groups. All slaughter animals are examined in connection with the meat inspection for possible tuberculosis lesions. Furthermore, bulls are tuberculin tested prior to entry at bull stations, and cattle are tuberculin tested prior to export.

Tuberculosis has not been detected in cattle in Denmark since 1988.

In 1988, bovine tuberculosis was diagnosed in farmed fallow deer. A national programme for eradication of bovine tuberculosis in farmed deer was initiated. Bovine tuberculosis has not been detected in farmed fallow deer since 1994. The Danish surveillance programme for demonstrating the absence of tuberculosis in farmed deer is based on an examination of all slaughter animals for possible tuberculosis lesions.

ENZOOTIC BOVINE LEUCOSIS

Enzootic bovine leucosis has not occurred in Denmark since 1990, and in 1991 Denmark was declared officially free of enzootic bovine leucosis by the European Union (Commission Decision 2004/320/EC).

Enzootic bovine leucosis has been a notifiable disease since 1959, and a control programme was initiated the same year. In 1989, a few seropositive animals were identified in five herds. Since then no new seropositives have been detected. The absence of enzootic bovine leucosis is demonstrated by tests of bulk milk samples from dairy farms and by tests of blood samples collected at slaughter. Bulk milk samples from all dairy herds are tested every three years. If livestock is imported for a dairy herd, bulk milk samples are tested for six consecutive months. In beef herds, blood samples are tested from every sixth slaughtered animal above the age of two years. Beef herds for which cattle have been imported are tested by samples from two slaughtered animals for a 12-month period.

The number of bulk milk samples and blood samples examined in the period 2004-2006 is given in Table 6.

Table 6: Number of bulk milk samples and blood samples examined under the Danish enzootic bovine leucosis surveillance programme, 2004-2006

Year	Number of bulk milk samples	Number of blood samples
2004	0	46,944
2005	5,830	20,053
2006	0	11,042

INFECTIOUS BOVINE RHINOTRACHEITIS/INFECTIOUS PUSTULAR VOLVOVAGINITIS (IBR/IPV)

Since 1992, Denmark has been recognised as free of infectious bovine rhinotracheitis (IBR) by the European Union (Commission Decision 2004/558/EC).

National control measures to eradicate the infection were implemented in April 1984. The infection had been eradicated by February 1991.

A serological surveillance programme for demonstrating the absence of IBR is carried out by testing bulk milk samples from dairy herds and blood samples from beef herds taken at the slaughterhouses. Bulk milk samples from all dairy herds are tested four times a year. Dairy farms in the southern part of Jutland bordering Germany are tested each month. If livestock is imported for a herd in any part of the country, bulk milk samples are tested for six consecutive months. All beef herds are tested by having one blood sample taken from their slaughtered animals every month, if possible. Beef herds for which cattle have been imported within the last six months will automatically have two animals tested by blood samples at slaughter (Table 7).

Table 7: Number of bulk milk samples and blood samples examined under the Danish infectious bovine rhinotracheitis surveillance programme, 2004-2006

Year	Number of animals tested through bulk milk samples	Number of blood samples
2004	29,652	34,020
2005	30,002	34,078
2006	28,195	43,724

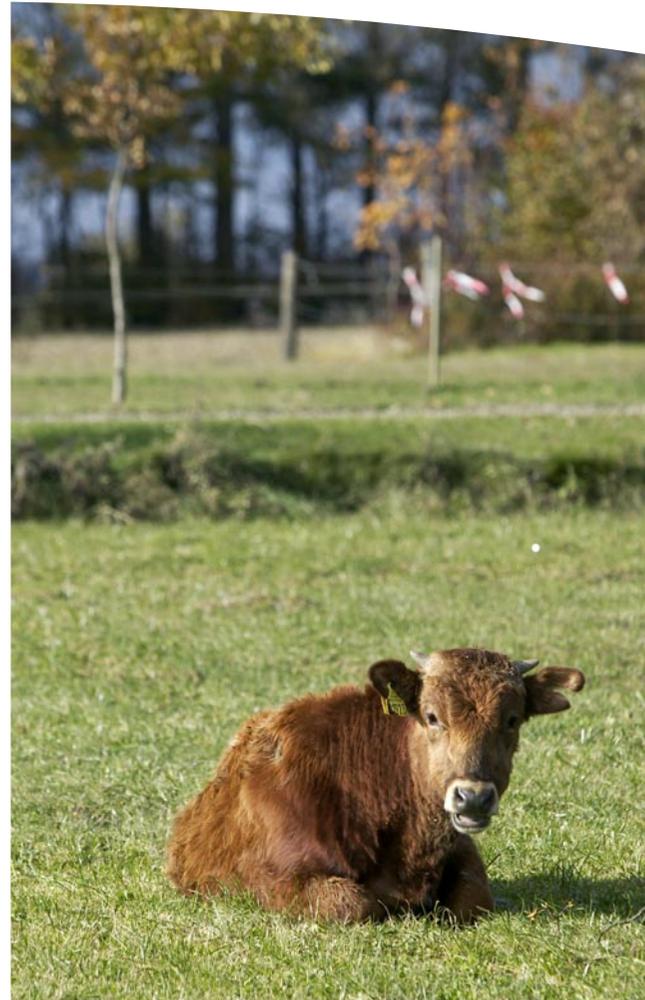
No infected herds were found in 2006, and the last case was diagnosed in September 2005. From that herd a single animal was found positive for antibodies in a slaughter blood test. All animals of the herd were subsequently sampled twice with a negative result. The herd was then declared free of IBR.

Information pertaining to other cattle diseases is listed in Table 8.

Table 8: The year when other cattle diseases listed by the OIE were last reported in Denmark

Bovine anaplasmosis*	Never recorded
Bovine babesiosis*	2000
Bovine genital campylobacteriosis*	1995
Contagious bovine pleuropneumonia	1886
Haemorrhagic septicaemia*	Never recorded
Lumpy skin disease	Never recorded
Malignant catarrhal fever*	Known to be present
Theileriosis*	Never recorded
Trichomonosis*	1990
Trypanosomosis*	Never recorded

* The disease is not a notifiable disease in Denmark.



A photograph of a sheep with thick, light-colored wool and a dark face, standing in a field of dry, golden-brown grass. The sheep has yellow ear tags. The background is a blurred landscape with trees and a building.

1.3 SHEEP AND GOAT DISEASES

In 2006, three cases of atypical scrapie were detected in Denmark. This was the first time atypical scrapie was found in Denmark. The findings may be attributable to the introduction of more sensitive diagnostic tests. The only other sheep and goat diseases listed by the OIE that occurred in Denmark in 2006 were Maedi-visna and caprine arthritis/encephalitis. Both diseases are included in the voluntary control programme for lentivirus.

TRANSMISSIBLE SPONGIFORM ENCEPHALOPATHY (TSE)

Scrapie is a TSE disease that may occur in sheep and in goats. The classical scrapie has been recognized as a disease in sheep for more than 200 years. But in 1998, an unusual form of scrapie in sheep was identified in Norway. The new type of scrapie was called atypical scrapie. Since 1998, atypical scrapie has been found in many countries in Europe. The number of cases of atypical scrapie has increased after the introduction of more rigorous surveillance and the introduction of certain TSE rapid tests, which are more sensitive to atypical scrapie.

DIFFERENCES BETWEEN CLASSICAL AND A TYPICAL SCRAPIE

Atypical scrapie differs from classical scrapie in its neuropathological and biochemical features. The atypical scrapie has mostly been diagnosed in apparently healthy animals, although clinically affected animals have been reported as well. The clinical signs of atypical scrapie differ from those of classical scrapie by being predominantly ataxia in the absence of pruritus, while pruritus is a predominant sign in classical scrapie. Furthermore, classical scrapie is contagious, which does not seem to be the case for atypical scrapie.

No incidents of classical or atypical scrapie were detected in Denmark prior to 2006. In 2006, atypical scrapie was diagnosed in three sheep from three different herds:

- The surveillance programme detected the first case on 20 September 2006. It was confirmed by Veterinary Laboratories Agency (VLA) in Weybridge on 29 September 2006 that it was a case of atypical scrapie. The affected animal was fallen stock and 10 years old. All 17 animals of the herd were culled and destroyed. They were subsequently tested negative for scrapie.
- The surveillance programme also detected the second case on 20 September 2006, and the VLA confirmed on 19 October 2006 that it was a case of atypical scrapie. The affected animal was fallen stock and seven years old. All 419 animals of the herd were genotyped. The 357 ovine animals without any ARR allele of the resistant genotype for scrapie were culled and destroyed. Fifty-six lambs with at least one ARR allele were slaughtered. The remaining five animals with genotype ARR/ARR were allowed to be used for breeding. The last animal was tested negative for scrapie on 20 March 2007.
- The third case was detected by the surveillance programme on 24 November 2006 and the VLA confirmed that it was a case of atypical scrapie on 8 December 2006. The affected animal was a 7-year-old slaughter animal. All 164 animals of the herd were placed under official movement restriction until the relevant EU legislation had been changed so that it would allow differences in the eradication strategy between classical scrapie and atypical scrapie.

These three cases were found after the introduction of the IDEXX HerdCheck rapid test for the screening of sheep and goats under the surveillance programme. The IDEXX HerdCheck rapid test is more sensitive to atypical scrapie, and the findings are considered to be attributable to the introduction of this more sensitive diagnostic test.

The eradication of the three flocks was handled in three different ways due to changes in the eradication strategy and the different situations of the three herds. When the cases were detected, the EU legislation did not distinguish between classical scrapie and atypical scrapie. Eradication strategies aimed at controlling classical scrapie were therefore used in connection with the first two herds affected, whereas a different strategy was used for the third herd.

All clinical suspected animals and fallen ovine and caprine animals older than 18 months were tested under the Danish surveillance programme. In September 2005, the surveillance was extended to include all caprine slaughter animals above 18 months, but that surveillance scheme ended in December 2006 due to a revision of the EU regulation. All ovine slaughter animals above 18 months were included in the surveillance programme from September 2006 to December 2006. The results of TSE surveillance programmes for sheep and goats in Denmark from 2004 to 2006 are shown in Tables 9 and 10.

Table 9: Results of the Danish TSE surveillance programme for sheep, 2004-2006

Category	2004		2005		2006	
	Negative	Positive	Negative	Positive	Negative	Positive
Fallen stock	5,253	0	3,986	0	4,349	2
Healthy slaughter	91	0	60	0	3,695	1
Clinical suspects	5	0	0	0	3	0
Total	5,349	0	4,046	0	8,064	3

Table 10: Results of the Danish TSE surveillance programme for goats, 2004-2006

Category	2004		2005		2006	
	Negative	Positive	Negative	Positive	Negative	Positive
Fallen stock	1,294	0	826	0	1,121	0
Healthy slaughter	26	0	241	0	594	0
Clinical suspects	0	0	3	0	1	0
Total	1,320	0	1,070	0	1,716	0

Some of the preventive measures for BSE in cattle also apply to small ruminants, such as the removal of specified risk material (SRM) from carcasses of slaughtered animals. Furthermore, a ban on feeding meat and bone meal to ruminants was implemented in 1997.

CAPRINE ARTHRITIS-ENCEPHALITIS

The disease, which has an enzootic occurrence, is mostly recorded as serological findings, as it is included in the voluntary control programme for Maedi-visna (cf. below).

MAEDI-VISNA

A voluntary control programme for lentivirus (Maedi-visna in sheep and caprine arthritis/encephalitis in goats) has existed since 1979. The Danish Cattle Federation manages the programme. Sheep and goat herds may obtain a disease-free status after negative serological tests for two consecutive years. At present, approximately 3,000 of 14,046 sheep and goat herds have the disease-free status.

Information pertaining to other sheep and goat diseases is listed in Table 11.

Table 11: The year when other sheep and goat diseases listed by the OIE were last reported in Denmark

Contagious agalactia*	Never recorded
Contagious caprine pleuropneumonia*	Never recorded
Enzootic abortion of ewes*	Never recorded
Nairobi sheep disease*	Never recorded
Ovine epididymitis (<i>Bruceella ovis</i>)*	Never recorded
Peste des petits ruminants	Never recorded
Salmonellosis (<i>Salmonella abortus ovis</i>)	Never recorded
Sheep pox and goat pox	1879

* The disease is not notifiable in Denmark.





1.4 EQUINE DISEASES

CONTAGIOUS EQUINE METRITIS

Taylorella equigenitalis was not detected in 2006. Approximately 350 samples were examined in 2006.

DOURINE

Dourine has never been recorded in Denmark. Serological examinations are performed in connection with international trade in horses and horse semen. Approximately 200 blood samples were examined in 2006.

EQUINE INFECTIOUS ANAEMIA

Equine infectious anaemia has not been recorded in Denmark since 1928. Serological examinations are performed in connection with international trade in horses and horse semen. Approximately 300 blood samples were examined in 2006.

GLANDERS

Glanders has not been recorded in Denmark since 1928. Serological examinations are performed in connection with international trade in horses and horse semen. Approximately 200 blood samples were examined in 2006.

Information pertaining to other equine diseases is listed in Table 12.

Table 12: Occurrence of other OIE-listed equine diseases in Denmark

African horse sickness	Never recorded
Equine encephalitis ¹⁾	Never recorded
Equine influenza*	Known to be present ²⁾
Equine piroplasmosis*	Not reported ³⁾
Equine rhinopneumonitis*	Known to be present
Equine viral arteritis*	Known to be present
Surra (<i>Trypanosoma evansi</i>)*	Never recorded

* The disease is not notifiable in Denmark.

¹⁾ Including equine encephalomyelitis (eastern and western) and Venezuelan equine encephalomyelitis.

²⁾ Due to widespread vaccination of competition horses and race horses, incidents among those horses are rare and of a mild nature.

³⁾ Year of last outbreak is not known.



1.5
SWINE
DISEASES

CLASSICAL SWINE FEVER (CSF).

The last reported occurrence of classical swine fever was in 1933. A serological surveillance programme is in place in order to demonstrate the absence of CSF in the national pig population. The serological surveillance programme has three components: a targeted surveillance programme for breeding and multiplier herds (implemented in January 2006) to ensure regular submission of samples for serological testing from each of these farms throughout the year, random sampling of 3,5% of sows and boars at slaughter, and testing of boars at artificial insemination centres. The number of samples examined in the period 2004-2006 is given in Table 13.

Table 13: Number of pigs examined under the Danish classical swine fever surveillance programme, 2004-2006

Year	Number of samples
2004	32,792
2005	35,972
2006	40,462

In 2006, six official suspicions of CSF were notified to the veterinary authority. All suspicions resulted in official restrictions on the affected herds while investigations, such as laboratory testing, were conducted. None of them was positive.

PORCINE RESPIRATORY AND REPRODUCTIVE SYNDROME (PRRS)

PRRS was first diagnosed in Denmark in March 1992. The disease is endemic. Both European and US strains of the virus are present in the Danish pig population.

Information pertaining to other swine diseases is listed in Table 14.

Table 14: Occurrence of other OIE-listed swine diseases in Denmark

African swine fever	Never recorded
Nipah virus encephalitis*	Never recorded
Porcine cysticercosis	Not reported ¹⁾
Swine vesicular disease	Never recorded
Transmissible gastroenteritis	Never recorded

* The disease is not a notifiable disease in Denmark.

¹⁾ Year of last outbreak is not known.



1.6 POULTRY DISEASES

The major event in 2006 was the highly pathogenic avian influenza (HPAI) H5N1 epidemic. A total of 44 wild birds with HPAI H5N1 were detected during the spring of 2006. Furthermore, a backyard flock was infected with HPAI H5N1 in May 2006. The surveillance for avian influenza in poultry was expanded significantly in 2006. The presence of low pathogenic avian influenza H5N2 and H5N3 was detected in three herds with game birds for restocking in 2006. Newcastle disease was not diagnosed in 2006, and the vaccination policy was continued. Several other poultry diseases listed by OIE occurred in Denmark in 2006. However, all these diseases had a sporadic occurrence, and the diseases mainly occur in ornamental, hobby and backyard birds.

AVIAN INFLUENZA (AI)

During the spring of 2006, 44 dead wild birds with HPAI H5N1 were detected in Denmark. This epidemic was not unexpected because the disease had already been found in wild birds in Germany and Sweden along the coastal areas of the Baltic Sea during the previous weeks. Restrictions were immediately imposed on all poultry and game bird holdings; poultry had to be kept indoors or in net-covered enclosures in order to avoid contact with wild birds.

A backyard flock infected with HPAI H5N1 was detected on 18 May 2006. That was the first outbreak of HPAI in poultry ever recorded in Denmark.

In 2006, the surveillance programme for AI in wild birds consisted in passive surveillance for AI in wild birds found dead and active surveillance of live birds in waterfowl reserves and migratory resting areas. Additionally, an extraordinary survey comprising a total of 1,007 samples of fresh droppings from wild birds was carried out around the Danish HP H5N1 outbreak.

In January and February 2006, only very few dead birds (passive surveillance) were submitted for laboratory examination, but after the infection had spread among wild birds in Europe since the middle of February, this changed considerably. The number of dead birds examined peaked in March (more than 600) and decreased to a lower level in May and June. This was due to increased avian influenza awareness among the general public and the Danish Veterinary and Food Administration's call via the media for submission of dead birds. The first detection of HPAI H5 in wild birds in Denmark was confirmed on 14 March 2006. A sequence analysis revealed that the virus isolated in Denmark was similar to the viruses found in other European countries. In total, 43 wild birds were detected with HPAI H5 in the southern part of Denmark during March and April 2006, and one more wild bird infected with HPAI H5 was found in May 2006. The infected wild birds were mostly ducks (60%), but also swans (16%), birds of prey (18%), crows (2%) and other waterfowl (4%) were found positive for H5N1 (Table 15). The last case was confirmed on 29 May. At all cases, protection and surveillance zones (subsequently changed to control and monitoring areas) were immediately established around the incidents (Figure 2). In total, 1,189 dead birds were examined in 2006. The monitoring of dead

wild birds covered the whole country, but the incidents were clustered in southeastern Denmark, especially along the Baltic Sea (Figure 3). It appears from Figures 3 and 4 that birds infected with HPAI H5N1 were found in areas where the density of wild ducks and swans is normally high in winter/early spring.

Table 15: Danish incidents of HPAI H5N1 in wild birds in 2006, broken down by species

Species	Latin name	Number positive
Greylag goose	<i>Anser anser</i>	1
Tufted duck	<i>Aythya fuligula</i>	26
Common buzzard	<i>Buteo buteo</i>	6
Rough-legged buzzard	<i>Buteo lagopus</i>	1
Whooper swan	<i>Cygnus cygnus</i>	3
Mute swan	<i>Cygnus olor</i>	4
Peregrine falcon	<i>Falco peregrinus</i>	1
Magpie	<i>Pica pica</i>	1
Great crested grebe	<i>Podiceps cristatus</i>	1
Total		44

Figure 2: Zones established as of 7 April 2006 at the height of the epidemic in wild birds

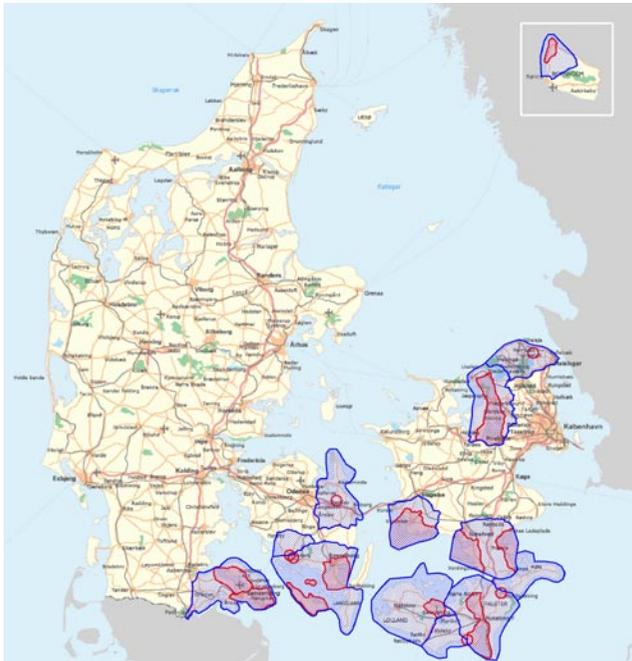


Figure 3: Wild birds testing positive and negative from January to May 2006. Yellow triangles are H5N1 negative and red squares are H5N1 positive birds.

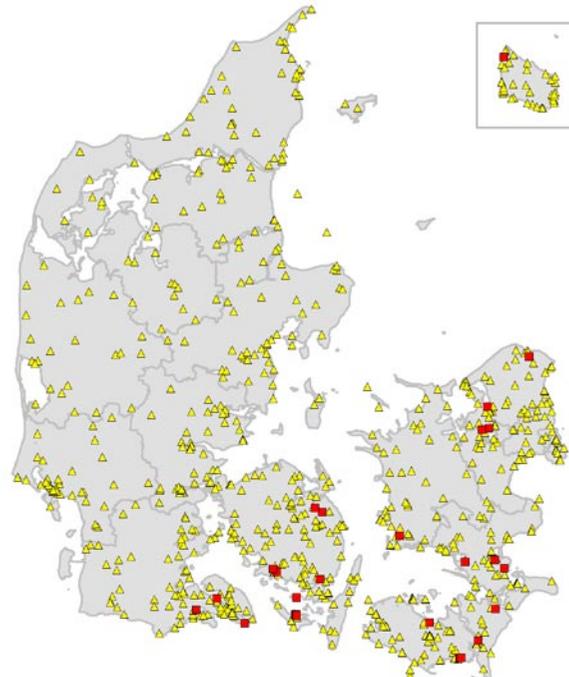
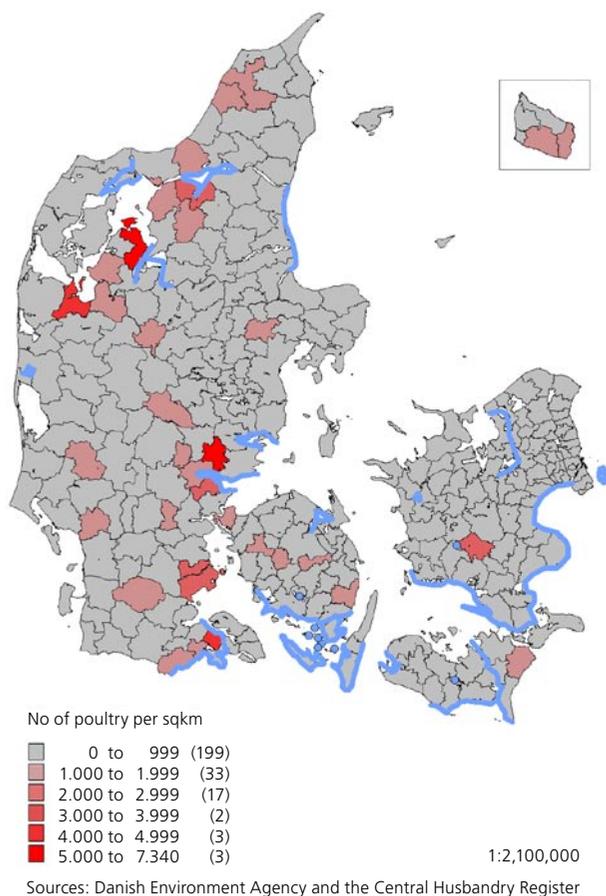


Figure 4: Blue lines show important Danish wintering areas for tufted ducks (*Aythya fuligula*), pochards (*Aythya ferina*), scaups (*Aythya marila*) and mute swans (*Cygnus olor*). High density of poultry is shown in red shades (25 March 2006)



During the period of active surveillance for AI in wild birds, 5,530 samples of bird dropping were analysed by using the polymerase chain reaction (PCR) (not including the 1,007 extraordinary samples from the HPAI outbreak). All samples were negative for HP H5N1, except one pool of samples from five herring gulls collected near the town of Bisserup in the County of Storstrøm. The gulls had not shown any clinical signs at the time of sampling. The location where the samples were taken was included in the restriction zone already established due to the detection of HPAI H5 in a dead wild bird. Other avian influenza virus subtypes isolated in connection with the active surveillance were of the following low pathogenic types: H14N5 (two samples), H13N6 (one sample) and H14N5 (one sample) (Table 16).

Further to this, a backyard flock with clinical disease and mortality in the County of Funen was diagnosed with HPAI H5N1 on 18 May 2006 (Figure 5). The source of infection was probably wild birds. The affected birds had not been kept in a net-covered enclosure in order to minimize contact with wild birds as prescribed. The flock was located near a site where a wild common buzzard (*Buteo buteo*) with H5N1 was found dead a few weeks before. A magpie (*Pica pica*) found dead on the affected premises was diagnosed with HPAI H5N1 on the 29 May 2006. Protection and surveillance zones as well as A and B areas according to Commission Decision 2006/135/EC were immediately established on 18 May 2006 on the basis of a positive PCR result.

Table 16: Results of the Danish avian influenza screening programme for wild birds, 2004-2006. Five samples were pooled and examined virologically. In 2006, however, some samples were examined individually.

	2004	2005	2006
Number of pools	761	558	1,102
(Number of samples)	(3,545)	(2,790)	(5,530)
Number of pools with avian influenza virus isolation	14	16	2
Number of samples with avian influenza virus isolation			2
- low pathogenic subtype H5 or H7	2	3	0
Number of pools with avian influenza virus detection by PCR	131	140	30
Number of samples with avian influenza virus detection by PCR			25
- low pathogenic subtype H5 or H7 – number of pools	13	27	3*
- low pathogenic subtype H5 or H7 – number of samples			6

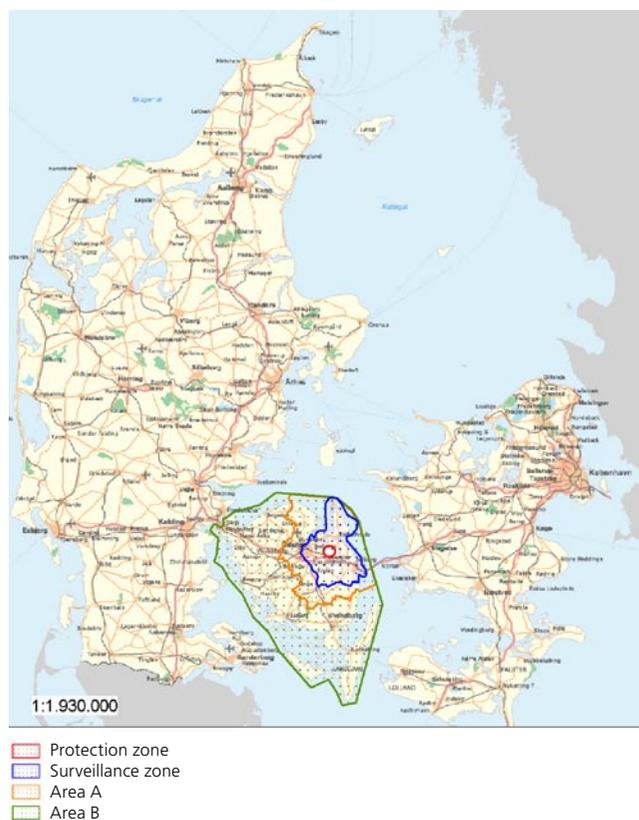
* One of these was high pathogenic H5.

All birds in the flock were immediately killed and sent to a rendering plant. Further to this, the infected holding was cleaned and disinfected. All restrictions were lifted on 30 June 2006 following an extended screening of poultry and wild birds within the zones. This outbreak did not cause any secondary outbreaks, and reoccurrence of the disease has not been observed in the area since then.

The surveillance programme for poultry and game birds for restocking was intensified in February 2006. The surveillance programme was mainly based on serology. PCR testing

was only used for ducklings and chickens from game birds. Furthermore, PCR testing was used in case of a positive serological result to confirm whether the herd was infected by virus. Only herds with more than 100 birds were included in the surveillance programme. Breeder flocks were tested once a year, pullets before release to egg production, outdoors layers four times a year and outdoor slaughter poultry before slaughter. In addition, turkeys were tested before slaughter. In risk areas, breeder flocks and indoor layers were tested twice a year. Risk areas were defined as areas 3 km from the coastal line and around large lakes. Herds of game

Figure 5: Zones and areas established on 18 May 2006 due to the outbreak of HPAI H5N1 in a backyard poultry flock



birds for restocking were tested four times a year during the season from February to August. Further, when poultry and game birds were traded, they had to be accompanied by a certificate stating that the herd had been tested within the preceding three months.

Nearly 2% of the poultry herds examined in 2006 were found positive in serological tests (Table 17). The follow-up PCR test for circulating virus in these herds did not result in any positive findings.

However, the PCR tests of offspring from mallards resulted in three herds with mallards for restocking being found infected with low pathogenic avian influenza (LPAI H5N2 and LPAI H5N3) in June and July 2006. These three herds were all killed. In two of these herds, the infection was thought to originate from contact with wild birds. In the third herd, the infection most likely originated from indirect contact with one of the other infected herds. There were no clinical signs in any of these herds, but in all three herds mallards were carrying the infection. In all cases, restriction zones were immediately established on the basis of the positive PCR results. A further four herds of game birds for restocking were found positive in virological tests with subtypes other than H5 or H7, one of these being H6N8, whereas the others could not be typed.

Table 17: Results of the Danish avian influenza surveillance programme for poultry and game birds for restocking in 2006

Type of poultry	Number of holdings	Number of serologically positive holdings				Number of virologically positive holdings		
		H5	H7	H5 & H7	Other	H5	H7	Other
Fattening turkeys	40	0	0	0	0	0	0	0
Chicken breeders	151	0	0	0	0	0	0	0
Laying hens in risk areas	30	0	0	0	0	0	0	0
Free-range laying hens	113	1	2	0	0	0	0	0
Free-range broilers	7	0	0	0	0	0	0	0
Ducks/mallards and geese	37	4	2	1	0	3	0	3
Pheasants, partridges, rock partridges and red-legged partridges	155	0	0	0	0	0	0	3
Total	533	5	4	1	0	3	0	6

The surveillance programme has shown that LPAI H5 was circulating among the population, mainly in mallards acting as asymptomatic carriers of AI. The aim of the surveillance was to find and eradicate any LPAI H5 or H7 virus circulating among the population by killing all birds of the infected herds.

Further information about the avian influenza epidemic in Denmark can be found in the report “Highly Pathogenic Avian Influenza H5N1 in Denmark, Spring 2006”, which can be downloaded from the website of the Danish Veterinary and Food Administration: www.dvfa.dk

NEWCASTLE DISEASE (ND)

The last outbreak of Newcastle disease in Denmark occurred in October 2005. As a consequence of the Newcastle disease epidemic in Denmark in 2002, the Danish Newcastle disease vaccination status was changed in the autumn of 2004 from non-vaccinating to vaccinating.

Prophylactic vaccination against Newcastle disease is compulsory for hens and turkeys in breeding herds, layer herds and for broilers if free-range or slaughtered when older than 10 weeks.

Also poultry brought to gatherings, exhibitions and markets and wintering game birds for breeding the following spring are to be vaccinated against Newcastle disease.

Vaccination status is checked in the commercial sector of the population by analysing blood samples from layer and breeding herds, and making regular checks of records and documentation of vaccination and of records of movements of vaccinated animals. In purebred poultry, backyard poultry and game birds, checks of vaccination against Newcastle disease are carried out through inspections of documentation and on-the-spot tests at gatherings, exhibitions and markets.

OTHER POULTRY DISEASES

Other poultry diseases listed by the OIE that occurred in Denmark in 2006 are avian chlamydiosis, avian infectious bronchitis, avian infectious laryngotracheitis, Marek's disease, pullorum disease and turkey rhinotracheitis (Tables 18 and 19). However, these diseases had a sporadic occurrence (Table 18), and the diseases mainly occurred in ornamental, hobby and backyard birds.

Table 18: Outbreaks of other poultry diseases listed by the OIE and notifiable in Denmark, 2004-2006. The year of the last occurrence is stated in brackets if no outbreaks of a disease occurred in the relevant year.

Poultry disease	2004	2005	2006
Avian chlamydiosis	16	11	7
Avian infectious laryngotracheitis	4	4	10
Fowl cholera	1	(2004)	(2004)
Fowl typhoid	(2002)	(2002)	(2002)
Pullorum disease	5	5	2

Table 19: The year when other poultry diseases listed by the OIE but not notifiable in Denmark were last reported in Denmark

Avian infectious bronchitis	Known to be present ¹⁾
Duck virus hepatitis	Suspected, but not confirmed
Infectious bursal disease (<i>Gumboro</i>)	Not reported ²⁾
Marek's disease	Known to be present ¹⁾
Mycoplasmosis (<i>Mycoplasma gallisepticum</i>)	1967
Mycoplasmosis (<i>Mycoplasma synoviae</i>)	Not reported ²⁾
Turkey rhinotracheitis	Known to be present

¹⁾ Has a low sporadic occurrence and is controlled by vaccination.

²⁾ Year of last outbreak not known.





1.7
LAGO-
MORPH
DISEASES

MYXOMATOSIS

Myxomatosis, which had not been diagnosed from 1962 to 1984, reappeared in 1985, and since then there have been a limited number of outbreaks of the disease in small rabbit holdings.

RABBIT HAEMORRHAGIC DISEASE

Rabbit haemorrhagic disease has not been recorded in Denmark since 1990.

Table 20: Number of outbreaks of myxomatosis in Denmark, 2004-2006

Year	Number of outbreaks
2004	2
2005	0
2006	2



1.8
FISH
DISEASES

Denmark has 368 freshwater trout farms and 25 marine fish farms whose main produce is rainbow trout. A few land-based marine fish farms have a minor production of turbot, one has cod production and in addition to these there are 10 eel farms. Since 1970, Denmark has had an official disease surveillance programme for all fish farms in the country. Since common EU legislation on animal health conditions governing the placing on the market of aquaculture animals was introduced with Council Directive 91/67/EC, the surveillance programme has been conducted according to the provisions laid down in that Directive.

VIRAL HAEMORRHAGIC SEPTICAEMIA (VHS)

Since 1970, Denmark has conducted an official surveillance and eradication programme for VHS, which has made it possible to eradicate the disease in 343 of the 368 Danish freshwater fish farms. As a result of this programme, the northern part of Jutland with 139 fish farms obtained the status of an EU-approved VHS-free zone in 1992. The programme is run in close collaboration with the aquaculture industry.

In the period 2004-2006, a decreasing number of outbreaks occurred (Table 21).

Table 21: Number of VHS outbreaks in Denmark, 2004-2006

Year	Number of outbreaks
2004	8
2005	6
2006	2

INFECTIOUS HAEMORRHAGIC NECROSIS (IHN)

IHN has never been recorded in Denmark, and the country has the status of EU-approved continental zone free of IHN.

INFECTIOUS PANCREAS NECROSIS (IPN)

Since 1970, Denmark has conducted a voluntary IPN surveillance programme and has so far registered 36 IPN-free fish farms. Most of these farms are situated along small river systems, and their water source is mainly well water. Twenty-one of the 36 IPN-free farms have brood stock and deliver eggs, fry and fingerlings to Danish trout farms as well as for export.

SPRING VIRAEMIA OF CARP (SVC)

Denmark has three carp farms registered as free of SVC. No outbreaks of SVC were reported in 2006.

Information pertaining to other fish diseases is listed in Table 22.

Table 22: Occurrence of other OIE-listed fish diseases in Denmark

Bacterial kidney disease (<i>Renibacterium salmoninarum</i>)	Reported present
Epizootic haematopoietic necrosis	Never recorded
Epizootic ulcerative syndrome*	Never recorded
Gyrodactylosis (<i>Gyrodactylus salaris</i>)*	Known to be present
Infectious salmon anaemia	Never recorded
Red sea bream iridoviral disease*	Never recorded

* The disease is not notifiable in Denmark.





1.9
MOLLUSC
DISEASES

For decades, there has been intensive commercial fishery on natural mussel stocks (*Mytilus edulis*) with annual landings of 90,000-100,000 tons. Natural stocks of European flat oyster (*Ostrea edulis*) only exist in the Limfjord. Through the 1990s, the oyster stock increased due to optimal climatic conditions for reproduction. In 2002, the stock had reached a size at which commercial utilisation was allowed, and in 2003 approximately two million oysters were landed. Aquaculture production of mussels and oysters started on an experimental basis in 2000, and the experience gained from these experiments began being transferred to a commercial scale in 2003.

BONAMIOSIS (*BONAMIA OSTREAE*) AND MARTEILIOSIS (*MARTEILIA REFRINGENS*)

In the middle of the 1990s, commercial interests in utilising the flat oyster as a resource for aquaculture purposes were considered. This was the background for establishing a scientifically based disease surveillance programme for bonamiosis and marteiliosis in the Limfjord in 1996. This surveillance programme focused on the wild oyster population, as there were no aquaculture activities in this field until the middle of 2000.

Since the autumn of 2000 when the first experiments of artificial cultivation of oysters were launched, an official disease surveillance programme for bonamiosis and marteiliosis has existed. It comprises both cultivated and wild stocks and observes the provisions laid down by the European Commission. The programme was launched to obtain official EU status for the Limfjord as bonamiosis- and marteiliosis-free.

During the first two years, 150 oysters were sampled biannually from three different sites. The sampling was either from aquaculture production sites, or from the natural stock if the number of active aquaculture production sites was insufficient. From the autumn of 2002, the sampling was reduced to two annual samplings of 30 oysters from three sites according to Directive 91/67/EC.

Bonamia ostreae or *Marteilia refringens* have never been detected in the flat oyster stock of the Limfjord.

Information pertaining to other mollusc diseases is listed in Table 23.

Table 23: Occurrence of other OIE-listed mollusc diseases in Denmark

Infection with <i>Bonamia exitiosa</i> ¹⁾	Never recorded
Infection with <i>Mikrocytos mackini</i>	Never recorded
Infection with <i>Perkinsus marinus</i>	Never recorded
Infection with <i>Perkinsus olseni</i>	Never recorded
Infection with <i>Xenohalictis californiensis</i> ¹⁾	Never recorded

¹⁾ Host not present in Denmark.





2
LIVESTOCK
STATISTICS

Table 24: Livestock population. Number of herds and animals in Denmark, 2004-2006. Source: Central Husbandry Register.

		2004	2005	2006
Cattle	Number of animals	1,732,657	1,626,758	1,620,826
	Number of herds	26,700	25,543	25,095
Sheep	Number of animals	209,020	194,341	195,907
	Number of herds	10,870	10,557	10,735
Goats	Number of animals	22,099	21,464	21,011
	Number of herds	2,866	3,056	3,311
Horses	Number of animals	39,209	47,332	52,882
	Number of herds	6,955	8,388	8,931
Farmed deer	Number of animals	19,303	18,399	18,362
	Number of herds	642	631	639
Pigs	Number of animals	12,868,394	14,537,698	14,581,382
	Number of herds	15,681	14,223	13,755
Poultry	Number of animals	29,812,776	29,812,776	26,497,348
	Number of herds	1,888	1,888	1,749

3

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