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Abstract

This publication contains information on the incidence of animal diseases to be combated and the prevalence of certain other infections in various animal species in Finland in 2017. The publication also describes the measures taken to prevent and combat animal diseases.

The animal disease situation remained good overall, but new diseases were also detected. Outbreaks of highly pathogenic avian influenza H5N8 amongst wild birds continued to occur during springtime. At the end of the year a highly contagious fish disease IHN was detected in four rainbow trout holdings. One Brant's bat was found positive of bat rabies caused by a new type of lyssavirus. New cases of salmonella were found on 18 farms and *Mycoplasma bovis* infections were again found in dairy farms.

Finland remained free of strategically important animal diseases such as enzootic bovine leucosis, brucellosis and bovine tuberculosis, IBR and BVD infections, PRRS infections in swine and *Echinococcus multilocularis* infection. The preparedness was especially targeted at combating African swine fever, avian influenza and rabies and was tested in a joint simulation exercise with the Nordic and Baltic countries.

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Tiivistelmä

Tämä julkaisu sisältää tietoa Suomen eläintautitilanteesta vuonna 2017. Julkaisuun on koottu ajankohtaista tietoa vastustettavien eläintautien ja eräiden muiden tartuntojen esiintymisestä eri eläinlajeilla maassamme. Julkaisussa kuvataan myös tehtyjä toimenpiteitä eläintautien ennaltaehkäisemiseksi ja torjumiseksi.

Eläintautitilanne säilyi pääosin hyvänä, mutta myös uusia eläintauteja todettiin. Korkeapatogeenisen H5N8-tyypin aiheuttamat lintuinfluenssatapaukset luonnonlinnuissa jatkuivat keväällä. Vuoden lopussa todettiin neljässä kirjolohipitopaikassa kalojen virustauti IHN. Yhdellä isoviiksisiipalla todettiin uuden lyssaviruslajin aiheuttama lepakkoraivotauti. Uusia salmonellatapauksia todettiin 18 tuotantotilalla ja *Mycoplasma bovis* -tartuntoja todettiin edelleen lypsykarjatiloilla.

Suomi säilyi vapaana strategisesti tärkeiksi katsotuista eläintaudeista kuten nautaleukoosista, luomistaudista ja nautatuberkuloosista, nautojen IBR- ja BVD-tartunnoista, sikojen PRRS:stä sekä *Echinococcus multilocularis* -tartunnoista. Eläintautivarautumista kohdistettiin erityisesti afrikkalaisen sikaruton ja rabieksen torjuntaan, lisäksi varautumista testattiin Pohjoismaiden ja Baltian maiden yhteisellä valmiusharjoituksella.

Beskrivning

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Referat

Denna publikation innehåller information om djursjukdomsläget i Finland år 2017. Publikationen innehåller aktuell information om förekomsten av djursjukdomar som ska bekämpas samt information om vissa andra infektioner hos olika djurarter i landet. I publikationen beskrivs också de åtgärder som vidtagits för att förebygga och bekämpa djursjukdomar.

Djursjukdomsläget förblev till största delen gott men också nya djursjukdomar konstaterades. Sjukdomsfall hos vilda fåglar som orsakats av högpatogen fågelinfluensa av typen H5N8 fortsatte under vårtiden. I slutet av året konstaterades fisksjukdomen IHN på fyra djurhållningsplatser som har regnbågslax. Ett fall av fladdermusrabies som orsakades av en ny typ av lyssavirus konstaterades hos en taigafladdermus. Nya fall av salmonella påvisades på 18 produktionsenheter och *Mycoplasma bovis* infektioner hittades igen på mjölkproduktionsgårdar.

Finland är fortfarande fritt från djursjukdomar som ses som strategiskt viktiga, såsom bovin leukos, brucellos och bovin tuberkulos, IBR och BVD hos nötkreatur, PRRS hos svin samt *Echinococcus multilocularis*-infektionen. Beredskapen var särskilt inriktad på bekämpning av afrikansk svinpest, fågelinfluensa och rabies. En beredskapsövning hölls i samverkan med de Nordiska och Baltiska länderna.

Contents

1. Animal disease situation in Finland in 2017

Cases of highly pathogenic avian influenza H5N8 amongst wild birds continued, with a total of seven cases reported in the spring, the most recent one occurring in June in Sastamala. Thanks to effective disease protection efforts, no influenza infections were detected at poultry holdings. Additionally, cases of infectious haematopoietic necrosis (IHN) in rainbow trout were detected at five aquaculture holdings. Otherwise the animal disease situation remained good. Apart from the avian influenza and IHN infections, Finland remained free from easily spreading animal diseases such as foot-and-mouth disease, swine fevers and Newcastle disease. A case of bat rabies was confirmed in one Brandt's bat and determined to have been caused by a new species of lyssavirus (KBLV). The infections did not spread to domestic animals, and no other cases of dangerous animal diseases were confirmed. Finland also remained free of strategically important animal diseases, such as enzootic bovine leukosis, bovine tuberculosis, infectious bovine rhinotracheitis (IBR), bovine viral diarrhoea (BVD), PRRS (porcine reproductive and respiratory syndrome) and *Echinococcus multilocularis*. Rabbit haemorrhagic disease (RHD), which is classified as an animal disease to be reported, killed one pet rabbit, but no wild rabbits were sent in for examination in 2017. During the year, Evira received a total of 246 reports of suspected animal disease cases. In 2016, the number of reports was 180, while in 2015 the number was 236. The majority of the reports concerned wild animals, on the basis of which bats and birds in particular were examined in large numbers for rabies and avian influenza, respectively.

African swine fever continued to spread in the Baltic countries. The large number of cases reported in Estonia in particular caused concerns in Finland as well due to the considerable volume of passenger traffic between Estonia and Finland. In response, communication about the disease was increased particularly at ports in order to reduce the risk posed by goods brought to Finland from the Baltic countries. The sampling of wild boars living in the wild succeeded better than in previous years due to collaboration with hunters. The collaboration yielded a larger number of samples than in previous years, all of which tested negative for the disease. Meanwhile the distribution of vaccine baits to combat rabies, another viral disease threatening Finland, was continued in an expanded area along the eastern border. Preparedness for animal diseases was tested with the Pegasus 2017 exercise, an African horse sickness simulation exercise conducted in collaboration between Nordic and Baltic countries. The exercise focused on the improvement of communications between the participating countries, the coordination of external communications and improving awareness of African horse sickness.

New cases of salmonella were detected on a total of 18 production holdings: five cattle holdings, nine pig holdings and four poultry holdings. The number of new cases decreased on cattle and poultry holdings, but increased on pig holdings. In 2016, the total number of new salmonella cases was 16, while in 2015 the total number of new cases was 21. The incidence of salmonella remained well below the target level of 1%. The number of *Mycoplasma bovis* infections detected on dairy farms remained high. Overall, the disease situation amongst rearing pigs and poultry remained good.

IHN, a viral disease affecting fish, was detected for the first time in Finland. Meanwhile the implementation of the viral haemorrhagic septicemia (VHS) eradication programme in Åland was continued. An outbreak of the disease was last detected there in 2012.

The numbers of imported animals continued to increase, as has been the trend in past years, with the numbers of imported street dogs being particularly high. Evira and other Finnish authorities continued to pay particular attention to detecting and preventing the illegal import of animals, as it is considered the greatest threat to the animal disease situation in Finland, along with wild animals. Cases of illegal import of companion animals in particular are uncovered regularly. It is likely that non-commercial poultry is also being transported to Finland in violation of legislative requirements.

Finland's geographically isolated location, relatively small number of animal imports and exports and the distances between animal holdings help keep the animal disease situation good. Most serious animal diseases are detected in other countries before Finland, which provides time for preparation and improving protection against the diseases in question. On the other hand, the global movement of people and goods gives rise to difficult-to-control risks in regard to the spread of infections, highlighting the importance of sharing information and rapid reaction. In Finland, domestic animals are usually kept in well-insulated shelters during the harsh winter conditions, which prevent the animals from coming into contact with wild animals. While disease prevention is often lax on backyard and non-commercial holdings, farmed animals are kept completely separated from non-commercial animals of the same species. Furthermore, cattle markets and common pastures are uncommon in Finland, which also helps prevent the spread of contagious animal diseases. On the other hand, Finland’s extensive network of holdings, such as those used in the multi-stage rearing of farmed animals and the related transfer of animals from one holding to another, can quickly spread infections to new areas.

The latest incidences of several serious animal diseases in Finland are listed in the tables presented in Appendix A. Data on long-term disease surveillance is collected in the tables presented in Appendix B, while the numbers of animals and animal holdings in Finland can be found in Appendix C. The disease-free statuses and additional guarantees granted to Finland are presented in Appendix D.

For information about zoonosis incidences in Finland and zoonosis monitoring programmes in animals and foodstuffs, please visit the website of Zoonosis Centre, a joint expert network of Evira and the National Institute for Health and Welfare, at www.zoonoosikeskus.fi (in Finnish and Swedish).

2. Cattle diseases

The disease situation amongst cattle remained good, and no cases of dangerous animal disease or diseases that spread easily were detected. New salmonella infections were detected on five cattle holdings. The most common reasons for conducting tests on cattle were the disease surveillance of bovine viral diarrhoea (BVD), infectious bovine rhinotracheitis (IBR), bluetongue disease, enzootic bovine leukosis and bovine spongiform encephalopathy (BSE); artificial insemination operations; determining the cause of diseases, such as respiratory infections, calf diarrhoea or abortions; meat inspections; and the import and export of cattle.

Number of *Mycoplasma bovis* infections remained high

New *Mycoplasma bovis* infections were detected on 20 dairy farms in 2017, corresponding to the number of cases detected in the previous year. All in all, infections have been confirmed on nearly two hundred farms since 2012. In nearly all the cases detected in dairy cows, the infection manifested as mastitis and was first detected in a milk sample. The *M. bovis* infections detected on beef cattle holdings were identified from respiratory infection samples.

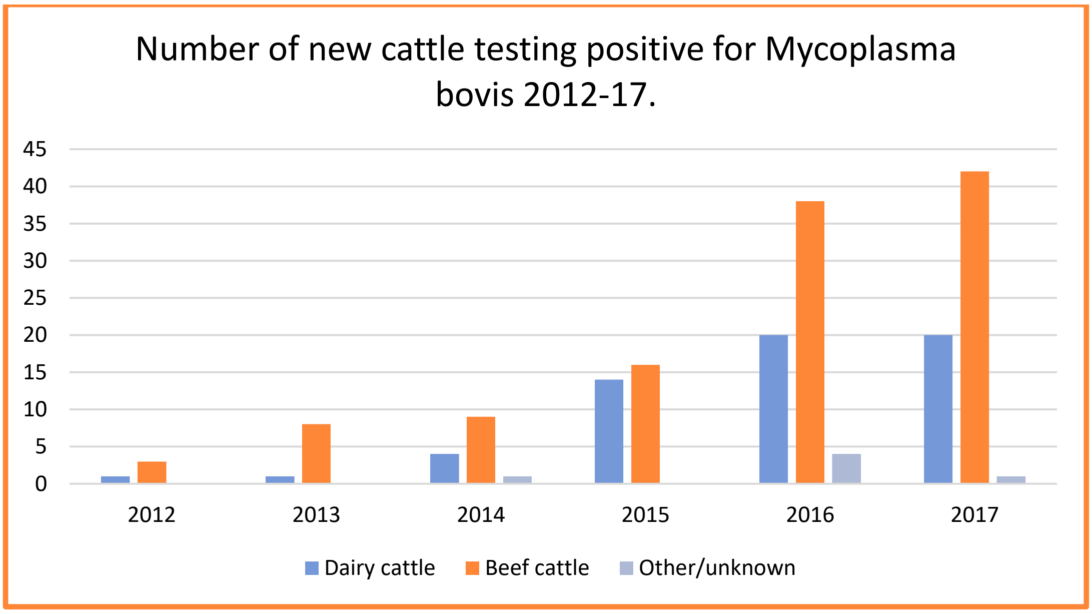


Figure 1. Number of new cattle testing positive for *Mycoplasma bovis* 2012–2017.

Diagnostics

In 2017, Evira examined a total of 454 whole carcasses or organ samples of cows submitted for pathological testing (Table 1). The number of samples submitted decreased slightly compared to the previous year (492 samples in 2016). A quarter of the samples consisted of foetuses, full-term stillborn calves and calves that died within a day of birth, which were submitted for abortion diagnosis. The number of samples tested in the context of meat inspections was 71.

As in previous years, the most common cause of abortion was bacterial infections. The most common isolates were the same as the ones identified in previous years: *Trueperella pyogenes, Ureaplasma diversum* and *Listeria monocytogenes.* A *Neospora caninum* protozoan parasite infection was detected in an aborted foetus from one holding, and antibodies were detected in the blood samples of six holdings submitted for abortion diagnosis. *Neospora caninum* is detected each year on a few new holdings. A total of 770 blood samples were tested for *Neospora* using ELISA. Some of the samples were from holdings that had previously tested positive, in which case testing was conducted to determine the extent of the outbreak. A total of 91 bovine blood samples from 19 holdings were tested for Q fever using ELISA. The majority of these samples were tested in the context of abortion diagnosis, with all tests being negative. No abortions caused by Schmallenberg virus have been identified in 2014–2017, and antibodies were only detected in cattle born before 2014.

Table 1. Numbers of pathological samples of cattle tested in 2009–2017 by reason for testing.

Reason for testing	2009	2010	2011	2012	2013	2014	2015	2016	2017
Disease diagnosis	243	239	255	257	362	253	250	306	270
Abortion diagnosis	88	89	78	257	368	98	106	120	113
Meat inspection	128	91	79	61	108	109	72	66	71
Total	**459**	**419**	**412**	**575**	**838**	**460**	**428**	**492**	**454**

The majority of samples submitted for determining the cause of a disease consisted of calves under the age of six months (approx. 45% of the samples). The most common findings were, as in previous years, respiratory tract infections, calf diarrhoea and other gastrointestinal diseases and systemic bacterial infections in young calves. Samples from three holdings were tested for malignant catarrhal fever (MCF), and the disease was confirmed on two of the holdings. In addition to this, MCF was confirmed in one bison.

A total of 156 deep pharyngeal swab kits collected from calves (one kit contains four samples) as well as paired serum kits collected from seven holdings (one kit contains paired sera of five animals) and nasal mucus samples collected from four holdings (one kit contains nasal mucus samples of five animals) were tested for respiratory tract infections (Table 2).

Table 2. Results of deep pharyngeal swab samples collected from cattle in 2009–2017. Numbers of positive submissions.

	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total number of submissions	**23**	**21**	**26**	**39**	**93**	**66**	**108**	**154**	**156**
Respiratory Syncytial Virus	5	9	8	8	24	13	33	28	32
Coronavirus	7	12	9	15	59	32	58	75	80
Parainfluenza-3 virus									6
Mycoplasma bovis	0	0	0	3	7	8	18	43	52
Pasteurella multocida	11	15	18	30	74	52	96	120	131
Histophilus somni	3	2	3	2	16	9	18	17	24
Mannheimia haemolytica	3	2	4	3	33	12	36	57	40
Ureaplasma diversum	13	13	19	24	46	40	62	99	105

The most common findings in the respiratory tract infection samples (pathological and clinical samples) were bovine respiratory syncytial virus and coronavirus, *Histophilus somni*, *Pasteurella multocida*, *Mannheimia haemolytica* and *Trueperella pyogenes* bacteria and ureaplasma. *Mycoplasma bovis* bacteria were detected in deep pharyngeal, lung, joint and ear infection samples. Antibiotic resistance was detected in *Pasteurella multocida* and *Mannheimia haemolytica* strains on several holdings.

A total of 218 sets of samples were submitted in the context of the calf diarrhoea test package (one package includes testing of five faecal samples), containing a total of 601 samples. The results for calves under six months old are presented in Table 3. As in previous years, the most common causes of diarrhoea (pathological and clinical samples) were rotavirus and *Eimeria* sp. coccidia. The zoonotic *Cryptosporidium parvum* protozoan that causes diarrhoea in calves was detected on a total of 65 holdings, either in pathological tests or diarrhoea samples. The number of holdings with *C. parvum* infections increased again from the previous year. People working with calves were also infected with cryptosporidiosis.

Additionally, 4 bovine faecal sample submissions were tested for coronavirus, with two of the submissions testing positive.

Table 3. Results of calf diarrhoea diagnostic test packages from calves under six months old between 2010 and 2017. Total numbers of sample submissions and numbers of positive submissions.

Total number of submissions	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
	179	**153**	**203**	**191**	**229**	**178**	**211**	**246**	**218**
Salmonella	0	0	1	0	1	0	1	1	0
Rotavirus (ELISA)	73	61	83	78	83	76	74	98	75
Corona (ELISA)	2	2	0	3	6	4	1	1	1
E.coli F5	2	0	0	0	0	0	0	0	0
Eimeria, over 10,000 OPG	39	27	35	29	38	32	40	34	33
Cryptosporidium spp. (staining)	23	22	30	23	26	31	36	76	72
Cryptosporidium parvum	6	5	7	13	20	24	30	41	58
Strongylida	3	2	4	3	6	3	2	3	4

Salmonella

The salmonella monitoring of cattle is a part of the national Salmonella programme in Finland. The incidence of salmonella is low in Finland, and it has remained under the target of 1%. In 2017, new salmonella infections were detected in faecal samples from a total of five cattle holdings: two dairy farms, one suckler cow herd, one calf rearing facility and one mixed herd. The detected serotypes were *S*. Typhimurium (2 pcs), *S*. Konstanz (1 pc) and *S*. Coeln (2 pcs). In addition to this, an infection (*S*. Hessarek) detected on one salmonella positive holding had already been detected in 2016. All the new salmonella infections detected in 2017 were detected in the holdings' self-monitoring samples, with one exception. On this one holding, salmonella was detected in the owner and the holding had delivered calves to a calf rearing facility that had tested positive for salmonella. In addition to this, two lymph node samples collected from cows in slaughterhouses tested positive for S. Typhimurium, but faecal samples collected from the corresponding holdings tested negative for salmonella. Cattle brought to artificial insemination centres and their holdings of origin as well as the quarantined bulls of the centres are also tested for salmonella. In 2016, these tests yielded no positive salmonella results.

Cattle disease surveillance

The disease situation amongst cattle was surveyed with monitoring programmes organised by the authorities for monitoring bluetongue disease, leukosis, infectious bovine rhinotracheitis (IBR), bovine viral diarrhoea (BVD), bovine spongiform encephalopathy (BSE) and brucellosis in dairy cattle and suckler cows.

Additionally, dairy cows that had undergone embryo transfer using embryos of foreign origin or had experienced an exceptionally high number of abortions over the last year were tested for BVD, IBR and leukosis. In addition to bluetongue disease, samples collected from slaughtered suckler cows for monitoring purposes were also tested for BVD and IBR. Samples were also tested in the context of artificial insemination operations, imports and exports.

Table 4. Numbers of viral and bacterial infection samples collected from cattle, sorted by reason for testing and test (serology, virus detection). No new infections were detected. Number of positive samples in parentheses.

	BVD		IBR		Leukosis	Bluetongue disease		Brucellosis	Schmallenberg virus infection	
	Serology	Virus detection	Serology	Virus detection	Serology	Serology	Virus detection	Serology	Serology (positive)	Virus detection
Dairy cattle monitoring/ bulk milk sample	715	0	715	0	715	0	0	0	0	0
Suckler cow monitoring/ individual blood sample	6,885	0	6,885	0	0	6,885	0	0	0	0
Artificial insemination operations	530[1)]	235	530[1)]	0	530[1)]	0	0	530[1)]	0	0
Disease diagnosis	102	112	100	109	45	1	2	205	96 (5)[3)]	1
Import (cattle, semen, embryos)	122[2)]	23	56	7	0	5	10	4	0	0
Other reasons (animal trade, export)	445	3	0	0	0	25	0	1	207	858
Total	**8,799**	**373**	**8,286**	**116**	**1,290**	**6,916**	**12**	**743**	**303 (5)[3)]**	**859**

1) includes both milk and serum samples
2) 99 samples from cows implanted with imported embryos
3) Schmallenberg virus antibodies were detected in cows that most likely contracted the infection between 2012–2013 based on their date of birth

BSE tests performed in 2017 are presented in Table 5, sorted by reason for testing. The number of BSE tests performed was of the same order as in 2016. The majority of the cattle tested had died spontaneously or been put down. The testing age limit for emergency slaughtered, animals that died spontaneously or those that were put down is still 48 months. However, animals of all ages are tested if the animal is suspected of having BSE.

Table 5. BSE tests in 2017. All test results were negative.

Healthy slaughtered	Clinical suspicions at holdings	Emergency slaughtered	Spontaneously died or put down at holdings	Disease symptoms in ante-mortem inspections	Total
1	0	43	11,552	0	**11,596**

Data on dairy cattle disease surveillance (Table B1), suckler cow herd disease surveillance (Table B2), tests for brucellosis in cattle, sheep, goats and pigs (Table B3) and surveillance of BSE in cattle (Table B4) between 2008 and 2017 is presented in the summary tables in Appendix B.

3. Pig diseases

The disease situation amongst rearing pigs remained unchanged: no animal diseases that spread easily or dangerous animal diseases were detected. Salmonella was detected in faecal and/or environmental samples from a total of eleven pig holdings, two of which had already tested positive for salmonella in 2016. The most common reasons for testing pig samples were surveillance of Aujeszky's disease, TGE (transmissible gastroenteritis), PRRS (porcine reproductive and respiratory syndrome), classical swine fever (CSF), African swine fever (ASF) and *Brucella suis* infections in pigs; artificial insemination operations; and disease diagnosis, particularly for the purpose of identifying pathogens causing gastrointestinal and respiratory tract infections in growing pigs. The threat of African swine fever in areas neighbouring Finland grew as the disease continued to spread in the Baltic countries and Poland. Examinations of wild boars living in the wild are covered in greater detail in Chapter 12.

Salmonella

The salmonella monitoring of pigs is a part of the national salmonella programme in Finland. By law, salmonella infections in pigs are considered animal diseases to be combated. The incidence of salmonella is low in Finland, and it has remained under the target of 1%. In 2017, salmonella was detected in faecal and/or environmental samples on a total of 11 pig holdings. New infections in 2017 included *S.* Typhimurium detected in imported animals and in one pig fattening house and *S.* Derby on one combination pig holding, two farrowing houses and four pig fattening houses. The environmental samples of one of the aforementioned pig fattening houses also tested positive for *S.* Enteritidis in addition to *S.* Derby. The pig holdings that had already tested positive in 2016 consisted of one holding supplying replacement animals (*S*. Typhimurium) and one farrowing house (*S*. Mbandaka). A combined lymph node sample consisting of samples collected by a slaughterhouse from the sows of five holdings also tested positive for *S*. Typhimurium, but the strain was not detected on any of the holdings. Additionally, one lymph node sample collected from a sow tested positive for *S.* Derby.

Trichinellosis not found in rearing pigs

Trichinellosis, which is classified as an animal disease to be reported, was not identified in rearing pigs, so the situation remained the same as in 2015 and 2016. However, in 2017 trichinellosis infections were detected in four farmed wild boars from two different wild boar holdings. On both holdings, the infection was diagnosed in two boars. The incidence of trichinellosis in pigs and wild boars is monitored by way of sampling conducted in connection with meat inspections.

Diagnostics

In 2017, Evira conducted pathologic-anatomical examinations of a total of 234 pig samples, a somewhat lower number than in previous years. The majority of the samples consisted of whole carcasses (160 samples), with the rest consisting primarily of organ samples. Over 80% of pig samples are submitted for disease diagnosis, and in most cases the reason for submitting a sample is to determine the pathogen causing gastrointestinal or respiratory tract infections in a specific age group on a holding. The majority of the examinations have to do with diagnosing diseases in piglets or young pigs. A number of samples are also sent in for testing conducted in connection with meat inspections, for abortion diagnosis and for determining the cause of death of individual pigs.

Of the identified causes of respiratory tract infections, the *Actinobacillus pleuropneumoniae* bacterium was the major cause of pneumonia in growing pigs, as in previous years. Influenza A virus was detected in samples from four holdings. In total, lung and nasal mucus samples received from 27 holdings were tested for the influenza virus. The most recent case of swine influenza occurred in 2016, when influenza A was detected in the samples of two holdings.

In the current situation, annual antibody monitoring of porcine enzootic pneumonia is only mandatory for holdings designated as special level breeding farms according to the Sikava health classification register. In addition to this, samples from holdings with suspected cases of porcine enzootic pneumonia are tested when necessary. In 2017, Evira tested a total of 638 samples from 30 holdings for porcine enzootic pneumonia antibodies, as a result of which porcine enzootic pneumonia was detected on two new holdings in early 2017. No further holdings tested positive later in the year. The number of samples examined was considerably lower than in 2016, when new positive holdings and their contacts were extensively investigated.

Table 6. Results of gastrointestinal infection diagnostic test packages (faecal samples) of weaned piglets and fattening pigs in 2017. Numbers of sample submissions and positive submissions. A submission was recorded as positive if a pathogen was detected in at least one sample. The total number of sample submissions was 36.

Pathogen	Number of sample submissions tested	Number of positive sample submissions (percentage of those tested)	Number of submissions in which the bacterium was the only pathogen detected (percentage of diagnoses)
Toxigenic *Escherichia coli*	27	8 (30%)	5 (63%)
Lawsonia intracellularis	26	13 (50%)	3 (23%)[1)]
Brachyspira pilosicoli	26	11 (42%)	0
Brachyspira intermedia	26	14 (54%)	1 (7%)
Brachyspira hyodysenteriae	35	0	0
Salmonella sp.	27	0	0

1) *Lawsonia intracellularis* bacteria were detected in 10 submissions that also tested positive for *B. pilosicoli* and/or *B. intermedia* (40% of submissions tested for these bacteria).

A total of 782 faecal samples from 42 holdings were bacteriologically tested for the *Brachyspira hyodysenteriae* bacterium, which causes swine dysentery, and other pathogens that cause diarrhoea in pigs. Nearly all of the faecal samples tested were from weaned or older pigs, with only a few holdings submitting faecal samples from piglets. All the samples tested were negative for swine dysentery. As in previous years, pathogens that cause gastroenteritis identified in pig samples included *Brachyspira pilosicoli*, *Brachyspira intermedia*, toxigenic *Escherichia coli* and *Lawsonia intracellularis* bacteria. The number of faecal samples tested was slightly higher than in 2016, when 628 faecal samples were bacteriologically tested. The number of samples was significantly lower than in years when cases of swine dysentery were recorded; the investigations conducted in response to detected cases also increase the total number of samples examined.

Surveillance

The disease situation amongst pigs was surveyed with monitoring programmes organised by the authorities for the purpose of monitoring Aujeszky's disease, TGE, PRRS and classical swine fever. Blood samples for the monitoring were collected from sows in slaughterhouses so that approximately 700 samples were collected from slaughterhouses that slaughter sows in proportion with the number of animals slaughtered; the maximum number of samples collected per holding was eight. Samples from farmed wild boars were collected during slaughter. In addition to the diseases mentioned above, the samples collected from farmed wild boars were tested for African swine fever and brucellosis. All test results were negative. Tests for significant swine diseases were also conducted in the context of artificial insemination operations, sampling in relation to the special level health classification of pig farms, disease diagnosis and import.

Table 7. Number of tests performed on pig blood samples for significant viral diseases, sorted by reason for testing. None of the diseases tested for were detected.

	Aujeszky's disease		**TGE**		**PRRS**		**Swine fever**		**ASF**
	Sero-logy	Virus detection	Sero-logy	Virus detection[3)]	Sero-logy	Virus detection	Sero-logy	Virus detection	Virus detection
Surveillance tests	736		736		877	140	736		
Artificial insemination operations[1)]	1,074		685		1,117		714		
Holdings with special level health classification			224		274				
Disease diagnosis[2)]	20	46		41	30	36	20	57	57
Export									
Import	226		233		324		226		
Farmed wild boars (surveillance)	39		39		39		40		44
Wild boars living in the wild	292	525					293	527	527
Total	**2,387**	**571**	**1,917**	**41**	**2,661**	**176**	**2,029**	**584**	**628**

1) Including holdings of origin
2) Rearing pigs, pigs kept for non-commercial purposes and farmed wild boars
3) Also for PED virus

Tests were also conducted on samples collected from wild boars living in the wild. Hunters have contributed actively to the monitoring of African swine fever by submitting blood and tissue samples from wild boars living in the wild to Evira. The disease has never been detected in Finland. Examinations of wild boars living in the wild are covered in greater detail in Chapter 12.

Summaries of tests for brucellosis in cattle, sheep, goats and pigs (Table B3) and serological tests for viral diseases and leptospirosis in pigs (Table B7) conducted between 2008 and 2017 are presented in Appendix B.

African swine fever is a persistent threat

African swine fever (ASF) is an easily spreading haemorrhagic fever caused by the ASF virus that infects domestic pigs and wild boars. The disease causes major financial losses, but does not infect humans. A total of 23 genotypes (gt) of the virus have been identified. There is no known vaccine or cure for the ASF virus.

African swine fever is endemic in Africa, and the disease was first described in Kenya in 1921. In 1957, ASF (gt I) spread out of Africa for the first time, when it was reported in Portugal. ASF was detected in Portugal again in 1960, at which point the virus also spread to Spain. The countries were not declared free from the disease until 1995. African swine fever has also been present on the island of Sardinia since 1978 (gt I).

In 2007, the disease (gt II virus) spread to Georgia, most likely in the food waste of a ship arriving from Africa. Since then, ASF has spread to a number of countries, including Russia, Ukraine and Belarus, and in 2014 to EU member states Poland, Lithuania, Latvia and Estonia. In the Baltic countries, African swine fever is constantly detected in wild boars living in the wild. ASF prevention is very challenging due to a number of factors, including the fact that there is no vaccine against it. As such, African swine fever is a persistent threat, as evidenced by the fact that the disease spread to a number of new European countries and regions in 2017. In 2017, African swine fever was detected for the first time in the Czech Republic and Romania as well as in Kaliningrad, in addition to which the disease spread to new areas in the central regions of Poland.

African swine fever has never been diagnosed in Finland. If the disease were to spread to Finland, it would inevitably cause major losses for the domestic pork production industry due to subsequent export restrictions, the euthanasation of animals, disruptions in the logistics chain and the renovation of holdings, among other factors. The ASF virus is extremely persistent and survives well in organic material, such as undercooked meat and blood. The disease typically spreads from country to country in food products that contain pork or pork products contaminated with the virus. The virus infects pigs when they are fed with food waste containing contaminated food products. The virus may also spread to new areas by being transmitted in live pigs and sperm as well as transport vehicles, humans and wild boars. The disease is also maintained and transmitted in Africa by soft ticks of the *Ornithodoros* genus, which have not been found

4. Poultry diseases

The incidence of contagious animal diseases in poultry is low in Finland compared to many other European countries, due to which Finnish poultry is only vaccinated against a few contagious diseases, whereas in many other countries poultry vaccination programmes encompass a wide range of different vaccines. The volume of antibiotics used in Finnish poultry production is also very low, as broiler chickens are not given any antibiotics and laying hens are only rarely medicated. However, Finland imports large numbers of both parent and production stock chickens, which increases the risk of diseases spreading to the country. As such, the origin of imported flocks is closely monitored by the Finnish poultry industry in collaboration with Animal Health ETT. Furthermore, imported flocks are kept quarantined by industry actors for approximately 12 weeks, during which time they are continuously monitored for serious infectious diseases in order to make sure that imported birds do not introduce serious infectious diseases to Finland. The samples collected from imported chickens are examined by Evira.

In 2017, the cases of avian influenza diagnosed in wild birds prompted the industry to review disease protection measures on holdings, in addition to which poultry kept outside had to be moved indoors. No cases of serious infectious diseases, such as avian influenza or Newcastle disease, were detected in poultry.

Highly pathogenic avian influenza

Highly pathogenic avian influenza was detected in Finnish wild birds for the first time in 2016, and cases of the disease in wild birds continued to be diagnosed in early 2017 as well (see Chapter 12).

Due to the avian influenza situation, efforts to improve preparedness were undertaken from late 2016 onwards. The Ministry of Agriculture and Forestry's decree requiring poultry to be kept indoors entered into force at the start of December 2016 and remained in effect until the end of May 2017. In addition, Evira advised poultry farms to make sure that their disease protection was effective and to immediately report any suspected cases of avian influenza to an official veterinarian. Furthermore, Evira advised restricting the carrion feeding of birds in coastal areas until the end of March. Evira also tested samples collected from poultry holdings due to symptoms indicative of avian influenza, such as increased mortality and decreased egg production. However, no cases of avian influenza were identified on poultry holdings, as in all cases the cause of the symptoms turned out to be something else. Examinations of wild birds are detailed in Chapter 12.

The most widespread avian influenza epidemic ever recorded in Europe

In winter 2016–17 and spring 2017, Europe experienced its worst avian influenza epidemic in recorded history when highly pathogenic (meaning that it causes high mortality rates in wild birds and poultry) avian influenza H5N8 spread to a total of 29 European countries. The first cases of the disease were confirmed in October 2016, and by August 2017 over 1,200 outbreaks of the disease had been recorded in poultry and other tame birds in addition to over 1,500 outbreaks in wild birds. The majority of these outbreaks were confirmed to have been caused by the H5N8 strain of the virus, though some were also found to have been caused by the H5N5 virus, in addition to which one individual outbreak on a poultry holding in Greece was confirmed as avian influenza H5N6. The number of reported cases decreased considerably after March, though individual cases of H5N8 continued to be reported throughout the summer and autumn. In northern Italy, H5N8 caused problems on poultry holdings during the late summer and autumn. At the end of 2017, reports also came in on the first confirmed cases of highly pathogenic avian influenza H5N6 in wild birds. At the end of the year, highly pathogenic avian influenza H5N6 was also detected on a poultry holding in the Netherlands.

Highly pathogenic avian influenza H5N8 caused high mortality rates in poultry and some mortality in wild birds as well. The range of wild bird species in which H5N8 was diagnosed was broad. In the early stages of the epidemic, the disease caused mass deaths among waterfowl, especially tufted ducks. As the epidemic progressed, the

Diagnostics

In 2017, Evira conducted pathologic-anatomical examinations of poultry samples collected from a total of 164 holdings in the context of health monitoring and import operations. Pathologic-anatomical examinations were performed on a total of 2,709 poultry samples, an increase compared to the previous year (2,467 samples). The majority of the samples were broilers (2,136), in addition to which a total of 244 turkeys and 307 laying hens, just under 30% of which consisted of non-commercial poultry, were also tested.

No cases of *Mycoplasma synoviae, M. gallisepticum* or *M. meleagridis* infections were detected in productive poultry, apart from a *M. synoviae* infection on a small laying hen holding of less than 150 birds. The testing of non-commercial poultry for *Mycoplasma gallisepticum* has decreased after 1 August 2016, from which point onward *M. gallisepticum* has no longer been classified as an animal disease to be combated on holdings of under 100 chickens and/or turkeys. Since then, *M. gallisepticum* antibody and *M. gallisepticum/M. synoviae* PCR tests on non-commercial poultry have been conducted within the framework of the health monitoring programme for preservers of native breeds of chicken and other non-commercial keepers of chickens and turkeys, or at the request of owners. In non-commercial poultry, *M. gallisepticum* infections were detected on three holdings and *M. synoviae* infections were also detected on three holdings.

The colibacillosis problems that have plagued the poultry industry in recent years continued in 2017. The problems are caused by strains of *E. coli*, most of which consist of APEC (Avian Pathogenic *Escherichia coli*) bacteria. A previous joint Nordic study comparing the *E. coli* strains that have caused colibacillosis in Denmark, Norway and Finland found that the same strain occurs in all three countries and that this strain is present in both hens and their offspring. These countries all have parent stock produced from the same grandparent generation, and it is likely that the infection is transmitted from the start of the production chain, i.e. the top of the pyramid. One of the most important means of mitigating the losses caused by the disease is vaccination. In 2017, an *E. coli* vaccine became available in the Finnish market and was subsequently put to use in the vaccination of parent stock birds. In addition to the vaccine now available on the market, work was begun on bringing an autogenous vaccine to Finland. The first breeder broilers were vaccinated with the autogenous vaccine just before Christmas 2017.

Swine erysipelas was identified on five laying hen holdings and three pheasant holdings. The numbers of roundworms have increased on poultry farms producing barn eggs and are sometimes transmitted to commercial eggs as well. Evira is currently in the process of establishing a roundworm surveillance programme in collaboration with the poultry industry for the purpose of preventing major outbreaks of the parasite, which have a negative impact on poultry health and production. Roundworms occurring in poultry cannot be transmitted to humans.

An asymptomatic infectious bronchitis virus (IBV) infection was detected in one breeding broiler flock. The IB virus strain in question was similar to vaccine viruses that have occasionally been found in imported flocks over the years. IBV is a common virus in non-commercial poultry, in which outbreaks of a highly pathogenic strain of the virus (QX) also occur. However, this strain has not been detected in productive poultry since 2011. The scheme launched in the spring of 2012 to vaccinate parent flocks of laying hens against IB with an inactivated vaccine was continued.

No cases of clinical (symptomatic) infectious bursal disease (Gumboro disease) were identified in 2017. Twelve cases of Marek's disease were identified in non-commercial poultry, but no cases of the disease were detected in commercial poultry. Laying hens and parent stock are vaccinated against Marek's disease. No cases of blue wing disease were detected in 2017, whereas in 2016 seven cases of the disease were diagnosed due to problems in the supply of blue wing disease vaccine. No cases of infectious avian encephalomyelitis (AE) were diagnosed. Parent stock is vaccinated against AE due to the fact that contracting the virus during egg production results in a 5–10% decrease in egg production, lasting for a few weeks. Chicks hatching from the eggs of hens infected with AE develop encephalomyelitis, resulting in a mortality rate as high as 25–50%.

Surveillance

The disease situation amongst poultry is surveyed with programmes maintained by the authorities for monitoring avian influenza (AI), Newcastle disease (AAvV-1, PMV-1) and salmonella. A summary of serological tests performed to detect avian influenza, Newcastle disease and avian pneumovirus (APV) in poultry between 2008 and 2017 is presented in Appendix B (Table B8).

The collection of samples for avian influenza testing was directed at different species of poultry in accordance with the EU Commission Decision 2010/367/EC. All holdings rearing parent and grandparent flocks were sampled for Newcastle disease. Approved poultry export facilities follow the programme defined in the Ministry of Agriculture and Forestry Decree No 1036/2013 for monitoring the incidence of the following pathogens: *Salmonella* Gallinarum/Pullorum, *Salmonella* Arizonae, *Mycoplasma gallisepticum* and *Mycoplasma meleagridis*.

Table 8. Test results of the EU surveillance programme for avian influenza in poultry in 2017. No avian influenza viruses or avian influenza antibodies were identified on any poultry holdings.

	Chicken breeder holdings[1)]	Conventional laying hen holdings	Organic and free range laying hen holdings	Organic broilers	Geese and ducks[2)]	Turkey breeder holdings	Fattening turkey holdings	Farmed game birds	Ratite holdings	Total
Samples	450	480	357	20	83	30	360	158	23	**1,961**
Holdings	35	48	36	2	5	3	36	13	3	**181**

1) Includes parent flocks of both laying hens and broilers
2) Includes both parent and productive poultry

Avian influenza antibodies were not detected on any poultry holdings. Avian avulavirus-1 (AAvV-1, PMV-1) antibodies were detected on two holdings in EU surveillance, but the holdings' birds displayed no clinical symptoms and the virus itself was not detected.

Table 9. Viral disease test results in poultry[1)] in 2017, sorted by reason for testing.

Reason for testing	**Avian influenza**		**Newcastle disease**		**APV[4)]**
	Serology (Pos. holdings/ pos. samples)	Virus detection (Pos. holdings/ pos. samples)	Serology (Pos. holdings/ pos. samples)	Virus detection (Pos. holdings/ pos. samples)	Serology (Pos. holdings/ pos. samples)
EU surveillance	1,961 (0/0)	4 (0/0)	7,203 (2/3[2)])	12 (0/0)	0
Imports	2,175 (0/0)	0 (0/0)	2,175 (1/2[2)3)])	0	2,115 (4/50[3)])
Disease diagnosis	233 (0/0)	648 (0/0)	213 (1/1[2)])	635 (0/0)	129 (0/0)
Total	**4,369 (0/0)**	**652 (0/0)**	**9,591 (3/6[2)3)])**	**647 (0/0)**	**2,244 (4/50[3)])**

1) Poultry refers to all birds that are raised or kept in captivity for the production of meat or eggs and other products for consumption, introduction of wildfowl, or the breeding programmes of the previously mentioned birds.
2) Serology positive, virus detection negative, no symptoms.
3) Maternal (transferred from mother to offspring) antibodies in imported birds.
4) Virus detection not used at Evira.

Salmonella

Finland's statutory salmonella monitoring programme covers all generations of broilers, turkeys and laying hens. The incidence of salmonella is low in Finland, and it has remained under the target of 1%. Salmonella was detected on a total of four poultry holdings (seven holdings in 2016). *Salmonella* Livingstone was diagnosed on one broiler rearing flock holding in three rearing flocks of productive broilers concurrently, in addition to which *S.* Typhimurium was detected in one rearing flock of parent stock broilers imported from Sweden. In addition to this, *S.* Typhimurium was also detected in two small-scale production egg-laying flocks. No cases of salmonella were detected in turkeys in 2017.

Additionally, *S.* Typhimurium was detected in geese on one holding and in partridges on one holding. Geese and partridges are not covered by Finland's statutory salmonella monitoring programme, nor is the disease classified as an animal disease to be combated in these bird species.

Voluntary health monitoring programme for productive poultry and non-commercial poultry farmers

As of the start of 2016, Evira has been maintaining a health monitoring programme for non-commercial poultry farmers as well. The programme is primarily aimed at preservers of native breeds of chicken and backyard poultry farmers who breed chickens and turkeys for non-commercial use. The programme includes testing for the antibodies of *Mycoplasma gallisepticum*, infectious bronchitis (IB) and infectious laryngotracheitis (ILT). IB virus antibodies were found to be very common in the samples tested in the context of the programme, whereas *Mycoplasma gallisepticum* antibodies were detected on only a few holdings. Only one holding that participated in testing in 2017 tested positive for ILT antibodies.

Information on the disease situation amongst poultry is also collected through voluntary health monitoring. The programme is used to survey parent flocks of both broilers and laying hens by testing blood samples for the antibodies of infectious bronchitis (IB), infectious laryngotracheitis (ILT), avian pneumovirus (APV) as well as *Mycoplasma gallisepticum* and *M. synoviae* infections. Chickens are also tested for the antibodies of vaccines against infectious bursal disease (IBD, also known as Gumboro disease), avian encephalomyelitis (AE) and blue wing disease caused by chicken anaemia virus (CAV). APV disease is not present in Finland. A total of 167 batches of samples were submitted in the context of the health monitoring programme, the majority of which (142) were from the parents of broilers and the rest (25) from the grandparents and parents of laying hens. The levels of AE antibodies in poultry samples shifted significantly when the AE vaccine had to be changed due to supply issues. The new vaccine does not raise the level of antibodies as high, and the response develops slower than before. However, no increase in the number of AE cases has been observed, so the response is still adequate for protecting birds against the disease.

Table 10. Health monitoring samples of chickens and broilers between 2008 and 2017.

Year	AE	CAV	IB	IBD	APV	ILT	*M. gallisepticum*	*M. synoviae*
2008	1,306	1,563	2,358	3,151		893	4,077	3,936
2009	1,061	3,096	1,764	3,078		661	4,194	3,930
2010	994	2,532	2,054	2,492	1,260	794	4,542	3,762
2011	1,137	3,096	3,654	3,056	1,056	1,120	4,672	4,453
2012	1,187	2,746	2,899	2,716	1,100	1,032	4,250	4,150
2013	980	2,717	2,020	2,717	980	739	3,600	3,600
2014	1,020	2,320	2,206	2,440	938	940	3,458	3,458
2015	840	1,759	1,682	1,759	920	702	2,460	2,481
2016	1,728	2,713	1,141	1,913	980	1,001	980	980[1)]
2017	1,300	1,900	1,018	1,900	770	838	795	795

1) Positive samples from one chicken breeder holding

In the health monitoring programme for turkeys, blood samples are tested for the antibodies of PMV-3 infection and avian pneumovirus (APV), as well as *M. gallisepticum*, *M. synoviae* and *M. meleagridis* infections. PMV-3 antibodies were detected on two turkey parent holdings. Antibodies of this disease have been identified for years in some turkey parent flocks and have in some cases been found to cause a reduction in egg production, but the infection has not been observed to cause symptoms in pullet holdings. All parent flocks imported to Finland are examined in accordance with the programme, and samples were submitted on a total of 15 occasions in the context of the programme. The disease situation amongst turkeys is currently so good in Finland that turkeys do not need to be vaccinated against any infectious diseases. Only in some individual cases have turkey flocks been vaccinated against swine erysipelas.

Table 11. Health monitoring samples of turkeys between 2008 and 2017.

Year	APV	PMV-3	*M. gallisepticum*	*M. synoviae*	*M. meleagridis*
2008	514	573	514	514	514
2009	577	580	565	573	567
2010	700	719 1)	559	559	599
2011	382	382 2)	400	400	400
2012	418	418 3)	438	438	438
2013	653	613 4)	595	595	595
2014	480	480 5)	480	480	480
2015	459	459 6)	459	459	459
2016	120	220 7)	120	120	120
2017	180	280 8)	180	180	180

1) A total of 114 positive samples on five holdings
2) A total of 25 positive samples on two holdings
3) A total of 81 positive samples on three holdings
4) A total of 38 positive samples on three holdings
5) A total of 55 positive samples on two holdings
6) A total of 11 positive samples on one holding
7) A total of 44 positive samples on four holdings
8) A total of 54 positive samples on two holdings

5. Sheep and goat diseases

The disease situation amongst sheep and goats has remained good, and no cases of dangerous or easily spreading animal diseases were identified in 2017. The most common reasons for conducting tests on sheep and goats were disease monitoring (maedi/visna in sheep and CAE in goats, as well as scrapie), disease or abortion diagnosis, meat inspections and parasite surveillance.

Diagnostics

In 2017, Evira performed pathologic-anatomical examinations on a total of 148 sheep samples and 13 goat samples. The number of samples was of the same order as in the previous year (166 samples). The number of samples tested in the context of meat inspection was 18.

A total of 16 samples collected from eight sheep holdings were tested to diagnose abortions. Infectious causes of abortions were *Staphylococcus aureus and Campylobacter fetus* ssp. *fetus*, which were identified in one sample each. The last recorded case of abortion in sheep caused by *Campylobacter* occurred in 1997.

The majority of the samples submitted for disease diagnosis were whole animals, mostly young lambs and kids. A common finding was a parasite infection in the abomasum or intestines (*Strongylida* suborder roundworms or *Eimeria* sp. coccidia) and subsequent diarrhoea or emaciation. *Haemonchus contortus* roundworms were detected on six holdings. Cysts caused by *Cysticercus tenuicollis* were found in samples collected from the sheep of four holdings in the context of meat inspection, as well as one necropsy sample.

Listeriosis of the central nervous system caused by *Listeria monocytogenes* bacteria was detected in six sheep and one goat. In addition to this, a systemic infection caused by listeriosis was diagnosed in one lamb. *Mannheimia haemolytica* bacteria were identified as the cause of pneumonia on seven sheep holdings, on two of which it had caused a systemic infection. *Bibersteinia trehalosi* bacteria were isolated in seven pneumonia samples and two systemic infection samples. *Clostridium perfringens* type D enterotoxemia was identified in samples from two sheep holdings and two goat holdings. On one of the goat holdings, it had caused severe diarrhoea. Fibrinous polyarthritis caused by swine erysipelas (*Erysipelothrix rhusiopathiae*) was diagnosed on one sheep holding. One sheep was diagnosed with *Salmonella enterica* ssp. *diarizonae* (61:-:1,5). One of the most common salmonella isolates in sheep worldwide is *Salmonella enterica* ssp. *diarizonae* (61:k:1,5).

Orf virus was detected on 16 sheep holdings over the course of the year, out of 23 holdings sampled.

During the year, Evira tested a total of 63 submissions of faecal samples from sheep and goats from a total of 40 holdings. Samples from 10 of the holdings were tested in order to determine the cause of diarrhoea or a disease, while the samples of the other 30 holdings were tested for parasite survey purposes. The most common findings were eggs of intestinal roundworms (*Strongylida* and *Strongyloides* sp.) and *Eimeria* sp.coccidia.

Surveillance

The disease situation amongst sheep and goats in regard to lentivirus infections in small ruminants (Maedi Visna in sheep and CAE in goats) is monitored with a voluntary health control programme. In autumn 2016, Finland was recognised as having negligible risk of classical scrapie in sheep and goats. As a result, the voluntary surveillance of scrapie became unnecessary. From autumn 2016 onwards, surveillance has been conducted by testing all sheep and goats over 18 months of age that have died in the carcass collection area for scrapie. In addition, holdings with at least 50 ewes or nanny goats located outside of the carcass collection area must also submit at least one sheep or goat over 18 months of age that died or was killed during the year for testing. Slaughterhouses also collect samples from all sheep and goats aged 18 months and above that show signs of emaciation or neurological symptoms and ones that have been emergency slaughtered. In 2017, no cases of classical or atypical scrapie were detected. It has been determined in the ongoing, several-years-long assessment of the genetic susceptibility of sheep to scrapie that the most common genotype in Finnsheep is ARQ/ARQ, which is susceptible to scrapie. The surveillance was discontinued in 2017 in accordance with Regulation (EC) No 999/2001 due to the fact that Finland does not have a sheep breeding programme aiming to create a resistant genotype.

The results of the scrapie surveillance programme between 2008 and 2017 are presented in Appendix B (Table B5).

A total of 3,077 samples collected from 76 holdings were tested for Maedi Visna and CAEV in sheep and goats (Table 12). No Maedi Visna/CAEV infections were detected in the tests. Brucellosis (*Brucella melitensis*) surveillance was conducted by testing samples collected in the voluntary health control programme for small ruminants and blood samples collected at slaughterhouses in connection with slaughtering. All samples were negative.

Table 12. Results of sheep and goat health control programmes in 2017. No Maedi-visna/CAEV infections were detected. No cases of classical or atypical scrapie were detected.

Species	Maedi-visna/CAE				Scrapie	
	Antibodies		Virus detection		Prion detection	
	Samples	Holdings	Samples	Holdings	Samples	Holdings
Sheep	3,061	75	0	0	1,673	474
Goat	16	2*	0	0	205	39
Total	**3,077**	**76**	**0**	**0**	**1,878**	**513**

* One of the holdings has both sheep and goats.

No tests were performed for bluetongue disease in small ruminants, and no Schmallenberg virus antibodies were detected.

Summaries of the brucellosis surveillance of cattle, sheep, goats and pigs (Table B3) and Maedi Visna/CAEV and scrapie tests of sheep and goats (Table B9) conducted between 2008 and 2017 are presented in Appendix B.

6. Fish and crayfish diseases

Finland's fish disease situation suffered a major blow in 2017 when infectious haematopoietic necrosis (IHN) was diagnosed on four rainbow trout farms. Apart from that, the health situation amongst fish and crayfish was good in 2017. The incidence of bacterial diseases typically occurring during the warm water period remained fairly low, and the volumes of antibiotics used were also low. On the other hand, problems caused by water mould continue to escalate, which is now being addressed with a joint research project. The discovery of the viral IHN came as a surprise and caused a great deal of work for Finnish authorities and the local fish farming industry alike.

Diagnostics

In 2017, Evira tested a total of 5,090 fish submitted for disease diagnosis or for testing as part of the fish health service. The incidence of bacterial diseases was primarily lower than in the four previous years despite the production volume of fish being higher; no cases of bacterial kidney disease (BKD) were detected in 2017. As a result, the volumes of antibiotics mixed in with feed and imported antibiotic feed used were also historically low. The situation may have been a reflection of the favourable growth conditions brought on by the cold and rainy summer.

In 2017, the message received from fish farmers was that problems caused by water mould are escalating. The Finnish Fish Farmers' Association conducted a survey on the subject targeted at inland fish farms, which revealed that water mould causes major losses especially in whitefish and landlocked salmon farming, and that water mould infection has become one of the primary diseases threatening the health of other farmed fish species as well. On the other hand, there are also fish farms that have not experienced any major problems with water mould. In response to these findings, the Finnish Fish Farmers' Association began organising a joint research project for the purpose of finding ways of solving Finland's water mould problem. Parties participating in the research project include the University of Jyväskylä, Åbo Akademi, Natural Resources Institute Finland (Luke) and Evira. The first phase of the project aims at investigating the incidence of the problem in greater detail on different fish farms, in different species of fish, in different age periods and in different growth conditions. After these preliminary findings, the project can focus on areas such as differences in fish management practices between fish farms experiencing problems and those that have not had any problems. The investigations are being conducted in collaboration between Luke and Evira. Additionally, the first phase of the project will examine the different species of water mould occurring on fish farms and the potential differences between strains. The research focusing on water mould species will be conducted primarily by Åbo Akademi. The Finnish Fish Farmers' Association applied for funding for the first phase of the project from the European Maritime and Fisheries Fund (EMFF). The research will be conducted in 2018 and the results should become available at the turn of the year.

Crayfish plague carried by signal crayfish endangering noble crayfish

The most significant crayfish disease observed in Finland is crayfish plague, which is caused by the *Aphanomyces astaci* water mould. Crayfish plague originates from North America, where endemic species of crayfish, such as signal crayfish, are natural carriers of the disease. The acute type of crayfish plague is usually observed in species susceptible to it, such as noble crayfish (*Astacus astacus*). Studies have shown that populations of noble crayfish may also harbour asymptomatic crayfish plague infections. As such, in addition to causing crayfish deaths, crayfish plague may also occur asymptomatically in bodies of water inhabited by either noble or signal crayfish. In 2017, acute crayfish plague was observed in noble crayfish in only one water body. The mortality in the noble crayfish in question was caused by the type of crayfish plague that naturally occurs in signal crayfish. The number of signal crayfish samples tested was only two, and crayfish plague was identified in both. Signal crayfish are extremely harmful to noble crayfish, and in practice the presence of signal crayfish in a water body completely prevents the reintroduction of noble crayfish. The EU's list of invasive alien species and renewed crayfish strategy set major limitations on the utilisation of signal crayfish, allowing the catching of signal crayfish but prohibiting their farming and introductions into the wild.

Surveillance

Regular inspections and sampling of aquaculture animals by Finnish authorities are targeted at finding potential incidences of viral haemorrhagic septicaemia (VHS), infectious hematopoietic necrosis (IHN), infectious salmon anaemia (ISA), salmonid alphavirus (SAV) and infectious pancreatic necrosis (IPN). In addition to this, koi herpesvirus (KHV), spring viremia of carp (SVC) and white spot disease (WSD) in crustaceans are monitored through spot checks. The spread of bacterial kidney disease (BKD) is prevented with the help of a voluntary health control programme. Furthermore, the spread of *Gyrodactylus salaris* (salmon fluke) in Upper Lapland is monitored through regular sampling. There are approximately 20 aquaculture species being farmed in Finland. The species susceptible to each disease are listed in legislation and surveillance is targeted at these species. In 2017, inspections based on monitoring programmes were conducted at 242 fish farms or enterprises with natural food pond farming.

Wild fish are tested for fish diseases when they or their gametes are introduced to fish farms for broodstock or for the purpose of producing juveniles. In addition to this, fish are tested for diseases in the context of exports and imports, in connection with transporting fish upstream and when they are found to exhibit symptoms of infectious diseases. There are approximately 20 wild fish species being farmed in Finland. The fish species susceptible to each disease to be combated are listed in legislation and surveillance is targeted at these species.

IHN infections detected in rainbow trout

In late 2017, a sample collected from the Bay of Bothnia in the context of normal risk-based viral disease monitoring was diagnosed with infectious haematopoietic necrosis (IHN), a viral disease affecting salmonids that is categorised as an animal disease that spreads easily. The fish infected with the disease were being kept in string bags in a winter storage area. In the investigation into the holding's contacts, the same infection was also found in the fish of another company being stored in the same winter storage area, on a broodfish farm in Tervo, North Savo, and in a fishing pond in Tervo. In January 2018, cases were also confirmed in fishing ponds located in Kaavi and Nurmes. The fish of the affected holdings have been put down and the holdings will be renovated once the spring snows melt. Meanwhile, examinations of both farmed and wild fish will continue in the established restricted zones and places of contact. The origin of the infection remains undetermined.

As a result of the findings, Finland lost its IHN-free status based on EU legislation. The aim is to restore the status in areas free of the disease and launch a monitoring programme

Apart from IHN, the fish disease free statuses granted to Finland remained unchanged. The restricted area established in Åland in the early 2000s to prevent the spread of viral haemorrhagic septicaemia (VHS) is still in force, and the eradication programme is progressing slowly, but steadily. In 2017, related official renovations were conducted on two fish farms. The remaining three fish farms are to be renovated in autumn 2019. No new cases of VHS have been detected since summer 2012.

ISA, SAV, SVC, KHV and WSD infections have never been detected in Finland. *Gyrodactylus salaris* (salmon fluke) has not been found in the protected zone in Upper Lapland since 1995, when an infection was detected in a now defunct rainbow trout farm located in the buffer zone.

Summaries of the tests performed between 2008 and 2017 for the diagnosis of viral diseases in fish (Table B10), BKD (Table B11) and *Gyrodactylus salaris* (Table B12) are presented in Appendix B. In addition to the tests mentioned above, Evira tested a total of 964 wild fish for VHSV, IHNV and IPNV infections, 571 for BKD and 358 for SAV, primarily in the context of capturing broodfish. The scope of the sampling has remained relatively consistent.

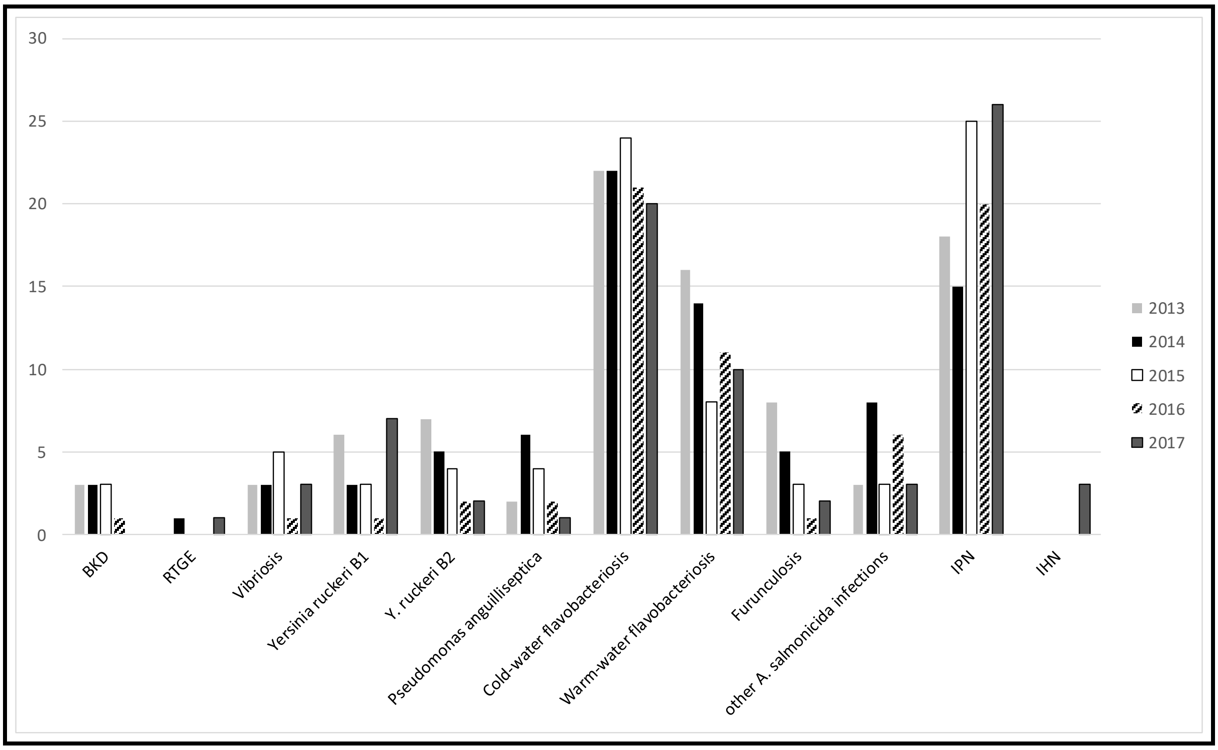


Figure 2. Incidence of the most common fish infections in Finland in 2013–2017, number of fish farms. The most common findings are flavobacteria, which affect young fish, and IPN virus, which are common in the rest of the world as well.

7. Horse diseases

The most common reasons for conducting pathological tests on horses were disease and abortion diagnosis, determining cause of death, determining the suitability of studs for breeding and determining the suitability of horses and sperm for import and export. Horses imported from the EU were also tested for covering sickness (dourine), glanders (malleus) and equine infectious anaemia (EIA) in cases where the horse and its documentation did not comply with import requirements. Testing for contagious equine metritis (CEM) in the context of stud farm and artificial insemination operations as well as regulatory testing for equine viral arteritis (EVA) and equine infectious anaemia (EIA) are based on legislation.

As regards bacterial diseases, several horses in Finland were diagnosed with strangles and respiratory infections caused by *Streptococcus equi* ssp. *zooepidemicus* bacteria.

With the exception of the testing of studs, the number of virological tests conducted for the diagnosis of horse diseases was low, which affects estimates on the prevalence of many infectious horse diseases in Finland. No cases of abortion caused by equine herpesvirus or arteritis virus were diagnosed. Conversely, several indications of equine herpesvirus EHV-4 were recorded during the year. An EHV-4 infection usually manifests as a respiratory infection, or equine rhinopneumonitis.

Chronic wasting disease (CWD) is classified as a dangerous animal disease in Finnish legislation. While the disease was not detected in Finland in 2017, cases of it were reported in several central and south European countries, including Bulgaria, Spain, the Netherlands, Croatia, Macedonia, France, Romania, Germany, Switzerland and Hungary. The disease is endemic in Romania, where cases were recorded in different parts of the country. Cases of CWD also occur nearly every year outside of Europe, including in the United States and Canada. Although CWD is nowadays often diagnosed in asymptomatic horses in connection with surveillance, cases of the disease causing clinical symptoms are also reported, as was the case in Canada and the US in 2017. CWD has a major impact on the equine industry, due to which the threat of the disease spreading to Finland needs to be taken into account, particularly in the context of imported horses.

Strangles

Samples from a total of three horses submitted to Evira tested positive for *Streptococcus equi* sp*. equi*, which causes strangles. According to the Ministry of Agriculture and Forestry's Decree No 605/2016, laboratories that study animal diseases to be reported must send isolates or positive DNA samples of any *Streptococcus equi* sp. *equi* strains that they isolate to Evira. Based on the Decree, Evira received isolates or positive DNA samples from 22 horses.

In 2014, Evira collaborated with Finnish equine industry organisations Suomen Hippos ry, the Equestrian Federation of Finland, Suomen Eläinlääkäripraktikot ry and the University of Helsinki's Faculty of Medicine to prepare a guide on strangles, which provides national recommendations on treating strangles and preventing the spread of the disease. The guide has been made available (in Finnish) on Evira's website, among other places.

Equine viral abortion and rhinopneumonitis caused by equine herpesvirus EHV-1 and EHV-4

In 2017, Evira tested samples from horses for EHV-1 and EHV-4 viruses for the purpose of disease diagnosis in response to respiratory and neurological symptoms and for determining the cause of abortion. Equine viral abortion is nearly always caused by equine herpesvirus 1 (EHV-1), while equine rhinopneumonitis, which is a respiratory disease, can be caused by both equine herpesvirus 1 (EHV-1) and equine herpesvirus 4 (EHV-4). No cases of equine viral abortion or rhinopneumonitis caused by EHV-1 were diagnosed based on the tests. However, serological tests performed on samples in the autumn revealed indirect evidence of an EHV-4 infection. According to the Ministry of Agriculture and Forestry's Decree No 605/2016, laboratories that study animal diseases to be reported must send isolates or positive DNA samples of any EHV-1 and EHV-4 strains that they isolate to Evira. Based on the Decree, Evira received one positive EHV-1 DNA sample that had been isolated in late 2017. There is no exact data available on the actual incidence of equine herpesvirus infections in Finland. The number of samples submitted for testing has remained low year after year.

Tests revealed no cases of equine influenza

No cases of equine influenza were identified in 2017, based on tests performed on paired serum and/or nasal mucus samples from 18 horses. Equine influenza antibodies are commonly detected in racehorses in particular, which are generally vaccinated against equine influenza. In tests performed by Evira in 2013–2015, equine influenza antibodies were detected in 70–80% of the horses tested.

No cases of EVA detected

In 2017, Evira tested a total of 20 horses for EVA or to rule out the disease in connection with examinations related to some other suspected disease. All tests were negative.

Pathologic-anatomical examinations of horses

In 2017, Evira conducted pathologic-anatomical examinations on a total of 48 horses (33 in 2016). Of these, 34 were conducted to diagnose abortions or diseases in young foals. In five cases, abortion was determined to have been caused by a bacterial infection of the placenta. In four of these cases, the bacteria isolated were part of the normal bacterial flora found on the skin of horses and in their environment, while in one case the isolate was *Listeria monocytogenes*, which is also typically found in soil. No cases of abortion caused by equine herpesvirus were diagnosed. In recent years, only a few abortions caused by herpesvirus have occurred each year. Arteritis virus was last determined as a cause of abortion in 2011.

Stud testing at Evira

In Finland, all studs used in artificial insemination must be tested annually before the start of the breeding period for *Taylorella equigenitalis* bacteria and EVA. If a stud's sperm is to be sold on the internal market of the EU, the stud must also be tested for EIA.

Studs used for breeding and four mares, or a total of 316 horses, were tested for *Taylorella equigenitalis*, a bacterium that causes contagious equine metritis (CEM), as required by Decree No 780/2014 on requirements for equine animals used for breeding. A *T. equigenitalis* infection was diagnosed in one Fjord horse stud.

As regards EVA, the disease situation has remained unchanged in recent years. Studs infected with the virus and excreting it have not been detected in Finland since 2010, and there have only been sporadic cases of other horses infected with the virus, most recently in late

2013/early 2014. In 2017, a total of 171 breeding studs were tested for EVA, with negative results. EVA antibodies were identified in a total of six studs. Further tests were conducted on sperm samples collected from three of these studs, with all the samples coming back negative. In autumn 2014, the testing of studs for EVA was expanded to cover all studs used on stud farms, which has provided valuable new information on the incidence of the disease in Finland.

A total of 15 studs were tested for EIA, with all the samples coming back negative.

No dangerous equine diseases detected in Finland

In 2017, two horses were tested in Finland for EIA in response to symptoms indicative of the disease. Additionally, one horse was tested for the disease to rule it out as part of examinations related to another suspected disease. None of the horses tested were diagnosed with EIA. The majority of EIA tests performed were conducted in the context of import and export of horses and gametes as well as breeding. A total of 14 horses were tested due to incomplete fulfilment of import requirements. The total number of equines tested for EIA was 41, with all the samples coming back negative.

Tests for dourine and malleus antibodies were performed on a total of seven horses due to incomplete fulfilment of import requirements and one horse in the context of exporting, in addition to which one horse was tested for malleus antibodies in order to rule out the disease. All of these tests came back negative. Dourine has never been detected in Finland. The last confirmed case of malleus in Finland occurred in 1942.

Equine infectious anaemia (EIA) spreads through blood contact

Equine infectious anaemia (EIA) is a dangerous animal disease to be combated that is caused by the lentivirus and spreads by blood contact. The disease is primarily spread by biting and bloodsucking insects, but the virus can also be transmitted through tools contaminated with blood and blood products. EIA affects all equines.

There is no vaccine against or effective treatment for EIA. Horses that survive an acute EIA infection remain carriers and potential transmitters for life. In the chronic stage of the disease, an infected horse suffers intermittent symptoms, including recurrent fever, weight loss and anaemia. Chronic and acute EIA can also both progress to death. A protracted infection may progress to a subacute stage, in which symptoms no longer occur, but the affected horse continues to spread the virus to other horses.

The disease should be suspected in horses that exhibit recurring fevers, swelling, anaemia, weight loss or poor condition. The risk of EIA should also always be considered if a horse has spent time abroad in areas where the disease has occurred or if new horses are brought to the same stable. The disease is diagnosed based on a serological test on a blood sample. If a horse is found to carry EIA antibodies, the veterinarian or laboratory must take immediate action in accordance with the Animal Disease Act.

The most recent recorded case of EIA in Finland occurred in 1943, but the disease continues to occur frequently worldwide. In recent years, cases have been reported in several European countries. Endemic in Romania, the disease has recently also been prevalent in Italy. The majority of the recent cases in Europe were diagnosed as a result of disease surveillance, with most of the affected horses remaining asymptomatic. Cases of EIA with clinical symptoms have also been reported in recent years in the US and Canada.

8. Reindeer diseases

The number of reindeer samples annually tested at Evira has remained at around 50 for the past few years. In 2017, however, Evira received a somewhat higher number of reindeer samples, a total of 81, of which 49 consisted of organ samples or parts of reindeer. The number of whole reindeer carcasses examined was 32, of which 16 were small newborns or calves no older than a few weeks, which was unusual compared to previous years. Based on the number of samples and findings, the health situation amongst reindeer has remained fairly good, as in previous years. Samples were received from nearly all parts of the reindeer management area, with the southern parts of the area yielding the most samples, as in previous years. The samples submitted from the northern parts of the area consisted primarily of organ samples. Reindeer samples are primarily received in the autumn and winter, when reindeer are slaughtered and placed in farms. In the summer, diseases are not always detected, as the reindeer roam freely in the wild.

Samples collected from full-grown reindeer and tested for TSE diseases (chronic wasting disease, CWD) where possible were negative. In 2017, samples were submitted from a total of 16 reindeer (Table B6).

The TSE situation amongst reindeer and other cervids has been monitored for several years now.

Table 13. TSE testing of cervids between 2008 and 2017, sorted by species. No TSEs were diagnosed.

Species	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Mountain reindeer (*Rangifer tarandus tarandus*)	3	0	5	2	1	4	13	3	6	16	53
Finnish forest reindeer (*Rangifer tarandus fennicus*)	1	0	0	0	0	0	0	0	4	13	18
Elk (*Alces alces*)	7	7	5	4	9	3	3	6	26	48	118
White-tailed deer *(Odocoileus virginianus)*	50	150	3	1	2	5	3	4	12	23	253
Roe deer (*Capreolus capreolus*)	7	0	2	1	2	2	2	0	7	13	36
Fallow deer (*Dama dama*)	8	1	0	1	0	0	1	1	0	1	13
Total	**76**	**158**	**15**	**9**	**14**	**14**	**22**	**14**	**55**	**114**	**491**

Meat inspection samples serve as indicators of reindeer health

The majority of reindeer samples are submitted by veterinarians inspecting reindeer meat in slaughterhouses. Of the organ samples submitted to Evira, 34 were meat inspection samples. *Echinococcus canadensis* G10 was detected in the lungs of seven reindeer – in 2016, lesions caused by the parasite were found in six reindeer. As in previous years, the infections occurred in the eastern parts of the reindeer management area. Other findings in the meat inspection samples included lesions caused by dog tapeworm *Taenia hydatigena* larvae (*Cysticercus tenuicollis*), liver bile duct cysts, which are considered abnormalities or neoplasms, and air-filled vesicle in the lungs, or bronchiectasis, caused by growth disorders. Because of their appearance, these types of cysts can easily be confused with cysts caused by echinococcosis. As such, all suspicious cyst findings must be submitted to Evira for testing. Additionally, lesions caused by wandering parasites were more prevalent in samples received from slaughterhouses than in previous years. Tissue cysts caused by the protozoan parasite *Besnoita tarandi* were found in three samples and *Elaphostrongylus tarandi* brain worms were found in one sample. Lesions caused by dog tapeworm *Taenia krabbei* larvae were found in one reindeer muscle sample.

Reindeer plagued by the cold spring and mouth infections

In early 2017, several cases of necrobacillosis (*Fusobacterium necrophorum* infection) and related aphthous stomatitis (mouth ulcers) were detected in reindeer placed in farms that were examined for the purpose of determining the cause of a disease or death. Parapoxvirus infections were detected in two reindeer, one of which was identified as cowpox. No orf virus infections were detected in 2017. Other isolates from inflammations included bacteria that cause purulent infections and *Clostridium* bacteria. All samples that included intestines were tested for salmonella, with negative results. A few individual cases of enteritis and peritonitis were identified. Cases of emaciation were often the result of other diseases, such as aphthous stomatitis. Other diagnosed causes of death in reindeer included injuries from car accidents and gunshot wounds.

In 2017, the spring was cold and wet, as a result of which reindeer calved while still in farms in many places. These circumstances resulted in an unusually high calf mortality. However, there were no signs of an epidemic amongst the examined calves.

While living in the wild, reindeer are exposed to a range of parasites that can cause infections. Although parasites are rarely the cause of diseases in reindeer, abnormalities caused by them often result in rejection in meat inspections. The majority of reindeer not slaughtered in the autumn are medicated against parasites each year when the reindeer are gathered in an enclosure for selection for slaughtering. The numbers of parasites in faecal and blood samples that were tested for parasites were low, as in previous years. Tissue cysts caused by parasites of the *Sarcocystis* genus were a common incidental finding in microscopic tissue examinations of cardiac and skeletal muscles.

9. Fur animal diseases

Diagnostics

In 2017, Evira conducted pathologic-anatomical examinations on a total of 491 fur animal samples. The number of samples rose compared to the previous year, when 409 samples were tested. Of the samples tested, 237 were minks, 221 were farmed foxes, most of which were blue foxes, and 33 were raccoon dogs. The increase in the total number of samples was primarily caused by the increase in the number of fox samples. In addition to this, a total of 228 faecal samples were tested to determine the cause of diarrhoea, with the number being slightly higher than in the previous year.

The most common finding in the fox samples examined at Evira was a systemic infection. The number of meningitis cases was higher than in the previous year. The increased numbers of systemic infections and especially meningitis can be explained by the salmonella outbreaks that occurred in the early summer, which caused infections especially in pups. The number of enteritis cases was of a similar order as the number of meningitis cases. The number of metritis cases was lower than in the previous year. In the previous year, *Lawsonia intracellularis* bacteria were an unusually common finding in cases of enteritis identified in foxes on the basis of pathologic-anatomical examinations as well as fox faecal samples tested to determine the cause of diarrhoea, but in 2017 the numbers of *Lawsonia* infections remained normal.

The most common finding in the mink samples examined was enteritis. The number of pneumonia cases was lower than in the previous year. One of the major diseases affecting minks is plasmacytosis, which is serologically diagnosed by a private laboratory. Pathological and anatomical changes indicative of plasmacytosis are identified in the minks examined at Evira each year. In 2017, plasmacytosis was diagnosed in the minks of six fur farms.

In farmed raccoon dogs, the most common finding was enteritis, as has been the case in previous years. The most common cause identified was parvovirus.

Major viral pathogens in fur animals include parvovirus and canine distemper virus. Diarrhoea caused by parvovirus was diagnosed in the farmed foxes and raccoon dogs of a total of 47 fur farms (60% of those examined) between July and December. No canine distemper virus infections were diagnosed during the year.

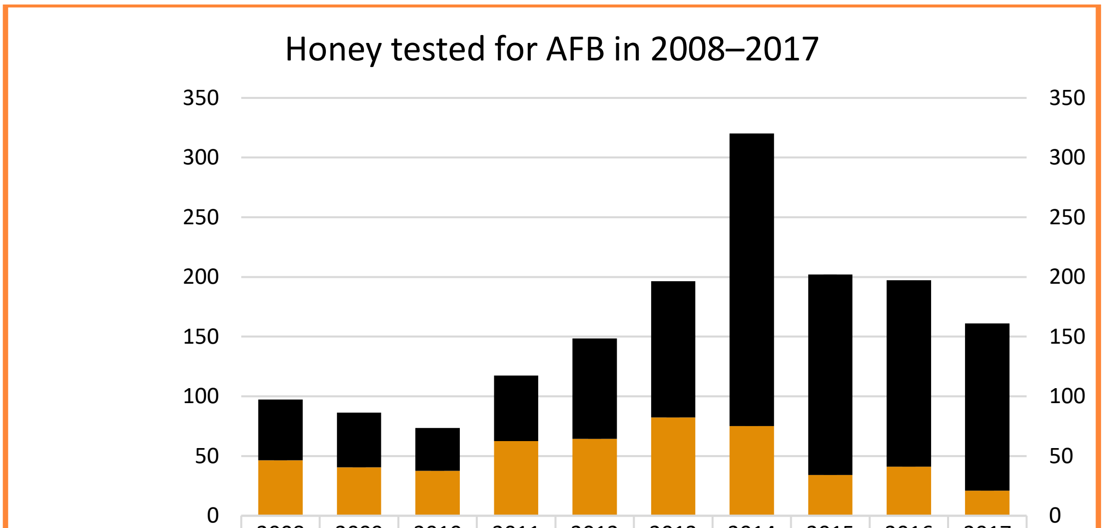
Salmonella infections were diagnosed in pathologic-anatomically examined animals and faecal samples tested to determine the cause of diarrhoea collected from a total of 13 fur farms, two more than in the previous year. In 2017, outbreaks of salmonella caused clinical symptoms and mortality on several fur farms, which was reflected in the findings of pathologic-anatomical examinations in the form of increased numbers of systemic infections and meningitis compared to the previous year.

Surveillance

Transmissible mink encephalopathy (TME) is an extremely rare, slowly progressing central nervous system disorder that affects farmed minks. Evira has been examining brain samples from fur animals for TME annually since 2006. No cases of the disease have been diagnosed. (Appendix B, Table B6).

10. Honey bee diseases

The most notable diseases affecting honey bees in Finland are Varroa destructor mites and the viral diseases spread by them, as well as American foulbrood, caused by the *Paenibacillus larvae* bacterium. The majority of the bee samples submitted to Evira are sent in for the purpose of testing for American foulbrood. In 2017, a total of 1,278 honey samples submitted by 143 beekeepers were tested for American foulbrood. Testing for American foulbrood became subject to a charge in 2015, due to which the number of samples submitted was unusually high in 2014. Since then, the numbers of beekeepers submitting samples have returned to the level prior to the change. In 2017, *P. larvae* was detected in 8% of the samples submitted to Evira (15% of beekeepers). Clinical American foulbrood was not detected. Compared to previous years, the proportion of positive samples has remained low. Of the samples tested between 2008 and 2016, 8–31% were positive.



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Keepers total	97	86	73	117	148	196	320	202	197	143
AFB not detected	51	46	36	55	84	114	245	168	156	140
AFB detected	46	40	37	62	64	82	75	34	41	21
Pos. percentage	47%	47%	51%	53%	43%	42%	23%	17%	21%	15%

Figure 3. Beekeepers who submitted honey samples for testing for American foulbrood in 2008–2017.

In 2017, 139 honey bee hives on the Åland Islands were examined for *Varroa destructor* mites. Based on the tests, the Åland Islands were declared to be still free from Varroa. The mites are common in mainland Finland, but samples are usually not tested for them in laboratories.

Thanks to the efforts to combat Varroa destructor mites, honey bee tracheal mites (*Acarapis woodi*) have also become less common throughout Europe, though they are still occasionally found in Finland. However, no honey bee tracheal mites were found in 2017.

European foulbrood infections are usually diagnosed in a few apiaries each year. In 2017, *Melissococcus plutonius*, the bacterium that causes European foulbrood, was found in two apiaries. In one of the two, the bees also exhibited clinical symptoms of the disease.

In 2016, a total of 13 samples were tested for nosema disease, of which eight tested positive for nosema spores. *Nosema apis* and *N. ceranae* parasites are common in Finland, but cause symptomatic diseases only rarely.

Beekeepers can also submit small beetles or larvae found in apiaries to Evira to identify small hive beetles (*Aethina tumida*). No small hive beetles were found in Finland in 2017.

11. Companion animal diseases

Diarrhoea caused by parvovirus potentially lethal for puppies

Dogs are most commonly examined at Evira to diagnose infectious and hereditary diseases, to investigate animal welfare issues and to determine the cause of death of newborn puppies. A large proportion of these examinations consists of forensic necropsies, some of which are conducted in connection with investigations of suspected animal welfare crimes. Determining the cause of infectious diseases is also a major reason for testing, especially when it comes to neo-natal puppies. Thanks to regular vaccinations, distemper and infectious canine hepatitis rarely occur nowadays in Finland.

Importation of dogs has increased

Infectious diseases spread by dogs brought to Finland from abroad pose a major risk to the health of Finland's dog population. There are many dog diseases that pose a threat to the health of both animals and people that do not occur in Finland, but are fairly common outside our borders. The most dangerous of these include rabies and echinococcosis, which are the only diseases classified in Finnish legislation as diseases to be combated in imported dogs. In recent years, antibiotic resistance has also become a major health risk in regard to imported dogs.

Dogs are actively imported into Finland. In recent years, Finnish Customs has annually inspected over 16,000 dogs entering Finland from outside of the EU. Evira is only notified of imported dogs that undergo veterinary border inspections, or so-called commercial imports, and illegal imports discovered after the fact. In 2017, the number of dogs imported from Russia increased to nearly one thousand dogs, a record breaking number. In the previous year, the number of dogs imported from Russia was 574. The majority of the dogs commercially imported from Russia are street dogs. Other major non-EU import countries include Australia, Bosnia-Herzegovina, Serbia and the United States. Imports from these countries have remained below 50 dogs per year, though in 2017 the number of dogs imported from Bosnia-Herzegovina increased to 69 individuals. As is the case with Russian imports, the majority of the dogs imported from the Balkans are street dogs.

Dogs entering Finland from other EU countries are not required to undergo veterinary border inspections. Evira is informed of commercial dog transfers from other EU countries by way of the EU's TRACES system.

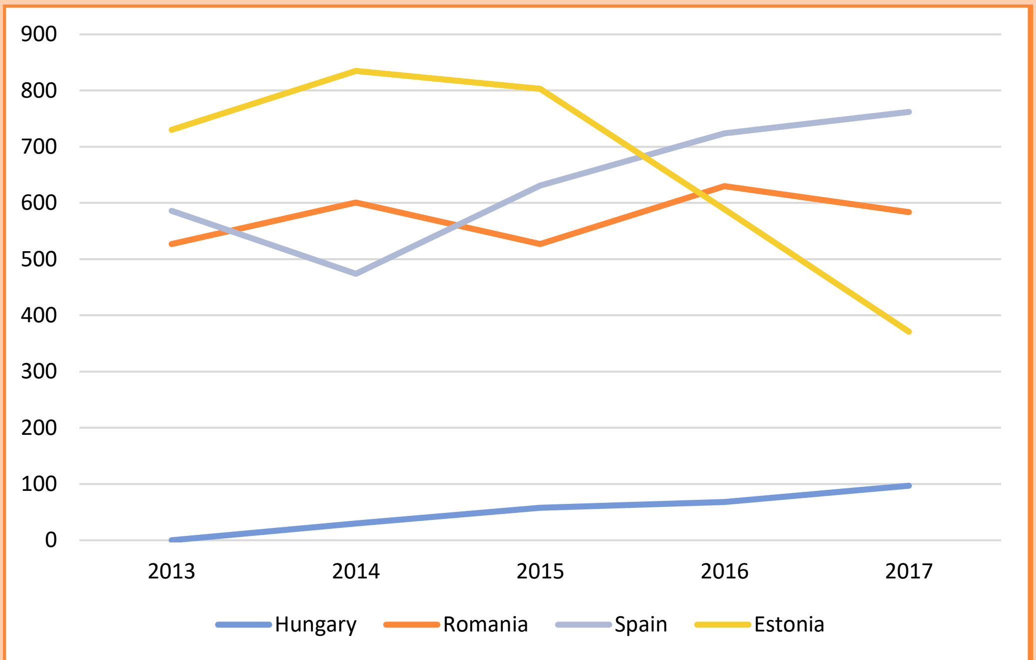


Figure 4. Commercial dog transfers from other EU countries to Finland in 2013–2017. The total number of countries from which dogs were imported during this period is 20, of which only countries that have imported 250 dogs or more are included in the figure.

Infectious diseases commonly occurring in dogs in Finland include respiratory tract infections caused by microbes and gastroenteritis caused by viruses. There are no effective vaccines against many of these infections, with the exception of diarrhoea caused by parvovirus. Parvoviral diarrhoea is regularly diagnosed in young dogs with insufficient immunisation against the virus. Dogs cannot develop so called herd-immunity against parvovirus, and the persistence of the virus in the environment poses a constant risk of infection. A parvovirus infection either strengthens the protection provided by the vaccine or causes the disease when antibodies provided by the dam perish and the protection provided by the vaccine is not yet strong enough to fight the infection.

Cases of vomiting and diarrhoea caused by coronavirus occur every year in dogs, as do cases of bacterial pneumonia and viral and bacterial infections that cause ‘kennel cough.’Canine herpesvirus is a relatively rare cause of mortality in newborn puppies. Herpesvirus infections are diagnosed in a few litters each year, and the number of cases has not increased in the past few years. Problems caused by herpesvirus mostly occur when a bitch is infected for the first time while pregnant and transmits the virus to the puppies when they pass through the birth canal.

Fatal infections caused by the protozoan *Toxoplasma gondii* are diagnosed every year. Infections caused by *Neospora caninum* parasites, on the other hand, are rare. Intestinal infections caused by *Giardia* sp. or *Cryptosporidium* sp. protozoans are diagnosed regularly. Dogs are susceptible to these infections if they roam freely in nature or are kept in an outside enclosure. The infection is usually asymptomatic, but in young puppies and dogs with an immune deficiency, it may cause long-term diarrhoea.

A total of 25 dogs, of which 17 had been illegally imported, were examined for rabies. Dogs were also tested for rabies in situations where, based on the symptoms, the possibility of rabies could not be ruled out. No cases of rabies were diagnosed in dogs (Table 14).

A total of seven dogs were serologically tested for *Brucella canis* antibodies. Of these dogs, five were tested before export and two were tested to diagnose a disease. Antibodies were detected in one dog, while the samples from the other six dogs were negative. Bacterial infections caused by *Brucella canis* occur every now and then in imported dogs and Finnish dogs taken abroad for breeding purposes.

In 2017, three dogs were diagnosed with leptospirosis based on notifications received from veterinarians.

Based on monthly reports from veterinarians, a total of 45 cases of canine leishmaniasis were diagnosed.

Viral diseases occur in cats of all ages

Viral diseases are more common in cats than dogs. Currently the most common individual cause of death in cats is feline infectious peritonitis (FIP) caused by coronavirus, and coronavirus is probably the most common viral infection in cats in Finland. Feline panleukopenia virus (FPV), also known as cat plague, occurs in young cats with insufficient immunisation. Viral respiratory tract infections and outbreaks caused by them also occur regularly in cats. There is no detailed data available on the prevalence of feline leukaemia virus (FeLV) and FIV infections in Finland. Systemic infections caused by the protozoan *Toxoplasma gondii* occur in young cats each year, and the infection is significantly more common in cats than in dogs.

A total of eight cats were tested for rabies due to clinical symptoms. No cases of rabies were diagnosed in cats (Table 14).

In addition to infectious diseases, common reasons for testing cats are investigations into animal welfare issues and the determination of hereditary diseases and causes of death of newborn kittens.

12. Wildlife diseases

The surveillance of wildlife diseases in Finland focuses primarily on diseases that can be spread between animals and humans, or zoonotic diseases (zoonoses). In addition to this, Evira also monitors the incidence of other animal diseases and outbreaks of new epidemics through animal samples submitted by members of the public. In addition to the information presented in this chapter on tests conducted on wildlife, information on tests conducted on wild fish and crustaceans is presented in Chapter 6 (Fish and crayfish diseases).

Avian influenza diagnosed in wild birds

The ongoing avian influenza epidemic started in late 2016. In 2017, a total of seven cases of H5N8 highly pathogenic avian influenza in wild birds were confirmed in Finland. Of these cases, six were white-tailed eagles found in the Åland Islands and Southwest Finland. The most recent case of avian influenza was diagnosed in a whooper swan that was found in poor condition in the Pirkanmaa region in late May.

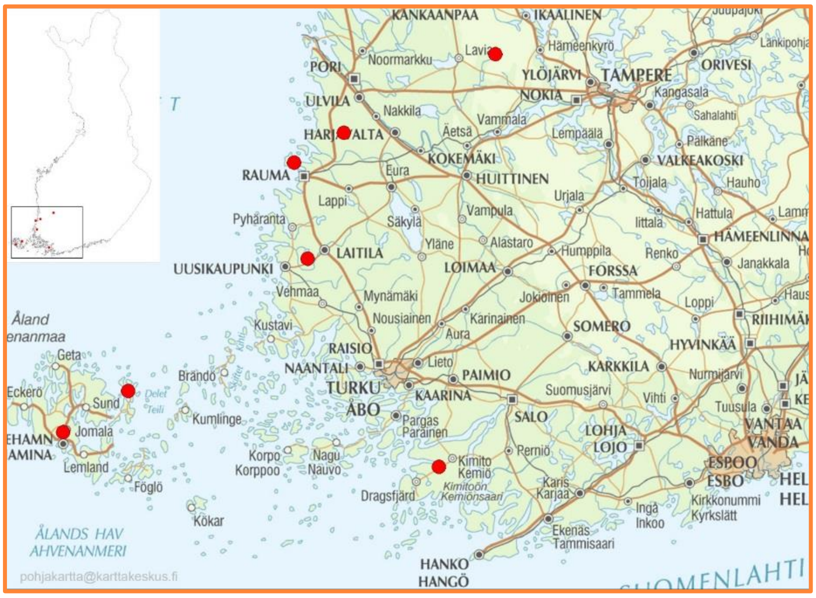


Figure 5. Map of avian influenza cases confirmed in wild birds in 2017.

In addition to investigating suspected cases of avian influenza, Evira also tested birds found dead in the wild as part of avian influenza monitoring. Over the course of the year, a total of 316 wild birds were tested. More detailed information on avian influenza tests performed on wild birds in 2008–2017 is presented in Table B13 of Appendix B.

Rabbit haemorrhagic disease (RHD)

In 2016, there was an outbreak of rabbit haemorrhagic disease (RHD) that killed a number of wild rabbits in the area in and around Helsinki. The virus was determined to be type RHDV2. In 2017, Evira confirmed one fatal case of the disease in a pet rabbit. During the year, Evira also tested three wild rabbits for the disease, none of which were diagnosed with RHD. However, two of the wild rabbits were found to be suffering from a coccidian parasite infection while one had a systemic bacterial infection (pasteurellosis). The RHD virus does not infect people or other pets. While the virus has been confirmed to infect brown hares in Australia and blue hares in Sweden, it does not seem to cause epidemics in these species, unlike in rabbits.

Chronic wasting disease (CWD) not detected

During 2017, chronic wasting disease (CWD) was diagnosed in several mountain reindeer and one red deer in Norway. Additionally, the disease was diagnosed in one elk, adding to the two cases confirmed in 2016. All of the mountain reindeer cases were diagnosed in the same reindeer population in the Nordfjella area, in response to which a decision was made to eradicate the entire population by hunting to combat the disease. The disease type infecting elk and red deer seems to be different from the one infecting mountain reindeer, which were diagnosed with the typical North American form of the disease. Evira tests wild cervids that died spontaneously or exhibited symptoms for CWD, as long as their heads can be sampled. In 2017, the total number of wild cervid samples tested for CWD was 97 (48 elks, 23 white-tailed deer, 13 roe deer and 13 Finnish forest reindeer). All of the samples were negative. In the last ten years, a total of nearly 500 cervids have been tested for CWD in Finland (table 13), with no positive diagnoses. In 2017, a European Commission regulation (2017/1972) concerning the establishment of a three-year surveillance programme for CWD in European member states with an elk or deer population entered into force. The countries included in the surveillance programme are Finland, Sweden, Estonia, Latvia, Lithuania and Poland. The programme will be carried out in 2018–2020.

Finland remained free of rabies

Efforts to combat rabies continued from previous years. In Finland, vaccine baits intended for wild animals are spread on the south-eastern border in order to stop rabies from spreading to the country via small predators. In 2017, the vaccine baits (a total of 180,000 vaccines) were dropped from aircraft in September–November. The incidence of rabies and consumption of the baits are constantly monitored through examinations of hunted animals and animals that are found dead. As such, hunters who collect samples play a key role in the success of the disease monitoring programme. Samples for rabies testing are mostly collected in Southeast Finland and North Karelia, where the baits are distributed. The collection campaign in 2017 went moderately well. Evira's goal was to receive a total of 360 animal samples from the distribution area of the baits, and a total of 353 foxes and raccoon dogs were ultimately submitted, yielding 334 brain samples for rabies testing and 268 blood samples for vaccine success monitoring.

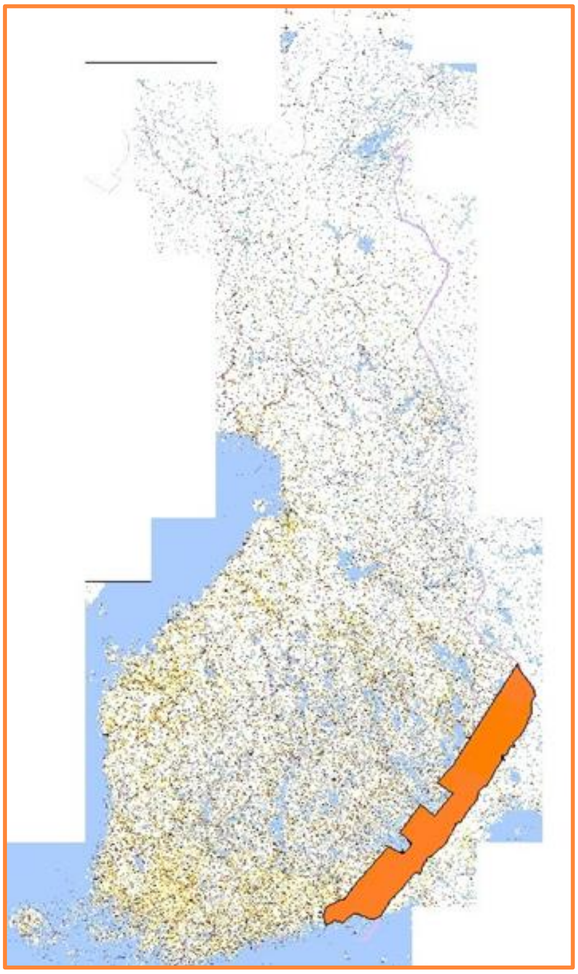


Figure 6. Drop zone of rabies vaccine baits.

In total, 572 wild animals from all over Finland were submitted to the rabies monitoring programme. The majority of these were raccoon dogs (260) and foxes (83). No cases of rabies were identified in wild predators. In addition to this, 78 bats were also tested for rabies, with one Brandt's bat found dead in Leppävirta testing positive for bat rabies. The virus was determined to be a new type of lyssavirus and subsequently named Kotalahti bat lyssavirus after its exact discovery location. The risk of contracting bat rabies is considered extremely unlikely in Finland for people who have no contact with bats as part of their work or hobbies.

Table 14. Animals tested for rabies for different reasons in 2017.

	traffic accident	put down due to aggressiveness	put down due to illegal import	put down due to injury	put down due to neurological symptoms	put down due to illness	found dead	Preliminary results/positives	Samples tested/positives
horse	0	0	0	0	0	1/ 0	0	1/ 0	**1/ 0**
cat	0	4/ 0	0	0	3/ 0	1/ 0	0	8/ 0	**8/ 0**
dog	0	4/ 0	17/ 0	0	2/ 0	2/ 0	0	25/ 0	**25/ 0**
wolverine	1/ 0	0	0	0	0	0	1/ 0	2/ 0	**2/ 0**
polecat	0	0	0	0	0	0	0	0	**1/ 0**
lynx	14/ 0	0	0	5/ 0	0	2/ 0	8/ 0	29/ 0	**30/ 0**
bear	1/ 0	0	0	1/ 0	0	0	0	2/ 0	**6/ 0**
fox	0	1/ 0	0	0	0	1/ 0	4/ 0	6/ 0	**83/ 0**
bat	0	0	0	1/ 0	0	4/ 0	63/ 1*	68/ 0	**78/ 1***
mink	0	0	0	0	0	0	1/ 0	1/ 0	**1/ 0**
badger	0	0	0	0	0	0	0	0	**13/ 0**
pine marten	0	0	0	0	0	0	0	0	**9/ 0**
otter	6/ 0	0	0	0	0	0	20/ 0	26/ 0	**38/ 0**
raccoon dog	1/ 0	2/ 0	0	1/ 0	0	1/ 0	4/ 0	9/ 0	**260/ 0**
wolf	5/ 0	0	0	1/ 0	0	0	5/ 0	11/ 0	**16/ 0**
wild mink	0	0	0	0	0	0	0	0	**1/ 0**
Total	**28/0**	**11/0**	**17/0**	**9/0**	**5/0**	**12/0**	**106/1***	**188/0**	**572/1***

* Kotalahti bat lyssavirus

Examinations of wild boars living in the wild

The threat of African swine fever did not decrease in 2017, as the disease continued to occur extensively in the Baltic countries. Hunters have participated actively in the surveillance of swine diseases by sending blood and tissue samples collected from wild boars living in the wild to Evira. Wild boars living in the wild have been tested for African swine fever in Finland since 2010, and between 2010 and 2013, Evira examined an average of ten samples each year. In 2014, Evira received samples from 138 wild boars. In 2015, active hunters submitted samples collected from 171 wild boars to Evira, while in 2016 the number of samples received was 366. The number of samples submitted continued to increase in 2017, with Evira receiving samples collected from a total of 527 wild boars living in the wild. More than half of the samples (315) were submitted from Southeast Finland. The most active municipality in terms of sample submission was Lappeenranta, from where samples from 73 animals were submitted.

In addition to African swine fever, samples from wild boars living in the wild were tested for classical swine fever and Aujeszky's disease. None of the viral diseases tested for were found in the samples.

Table 15. Numbers of samples collected from wild boars living in the wild and submitted for African swine fever testing by municipality in 2017. All samples tested negative for African swine fever.

Municipality	ELY Centre	number of boars
Alajärvi	South Ostrobothnia	2
Alavus	South Ostrobothnia	3
Isojoki	South Ostrobothnia	1
Kauhava	South Ostrobothnia	1
Kuortane	South Ostrobothnia	1
Lapua	South Ostrobothnia	1
Joroinen	South Savo	4
Juva	South Savo	1
Kangasniemi	South Savo	3
Mikkeli	South Savo	8
Mäntyharju	South Savo	2
Puumala	South Savo	1
Hartola	Häme	1
Hausjärvi	Häme	1
Heinola	Häme	4
Hollola	Häme	1
Lahti	Häme	2
Sysmä	Häme	19
Hamina	Southeast Finland	5
Iitti	Southeast Finland	6
Imatra	Southeast Finland	9
Kotka	Southeast Finland	4
Kouvola	Southeast Finland	37
Lappeenranta	Southeast Finland	73
Luumäki	Southeast Finland	15
Miehikkälä	Southeast Finland	27
Parikkala	Southeast Finland	43
Pyhtää	Southeast Finland	27
Rautjärvi	Southeast Finland	28
Ruokolahti	Southeast Finland	8
Savitaipale	Southeast Finland	14
Virolahti	Southeast Finland	19
Kajaani	Kainuu	1
Kuhmo	Kainuu	3
Sotkamo	Kainuu	1
Suomussalmi	Kainuu	4

Table 15. Numbers of samples collected from wild boars living in the wild and submitted for African swine fever testing by municipality in 2017. All samples tested negative for African swine fever.

Hankasalmi	Central Finland	1
Jyväskylä	Central Finland	1
Jämsä	Central Finland	1
Keuruu	Central Finland	1
Luhanka	Central Finland	2
Kangasala	Pirkanmaa	4
Mänttä-Vilppula	Pirkanmaa	1
Orivesi	Pirkanmaa	2
Pälkäne	Pirkanmaa	4
Ruovesi	Pirkanmaa	1
Tampere	Pirkanmaa	6
Kristiinankaupunki	Ostrobothnia	1
Laihia	Ostrobothnia	1
Veteli	Ostrobothnia	1
Ilomantsi	North Karelia	1
Joensuu	North Karelia	1
Kitee	North Karelia	6
Liperi	North Karelia	1
Nurmes	North Karelia	2
Rääkkylä	North Karelia	1
Tohmajärvi	North Karelia	2
Valtimo	North Karelia	1
Kalajoki	North Ostrobothnia	1
Lumijoki	North Ostrobothnia	1
Siikalatva	North Ostrobothnia	1
Vaala	North Ostrobothnia	1
Tervo	North Savo	1
Pori	Satakunta	1
Askola	Uusimaa	2
Lapinjärvi	Uusimaa	30
Lohja	Uusimaa	1
Loviisa	Uusimaa	19
Myrskylä	Uusimaa	2
Mäntsälä	Uusimaa	2
Nurmijärvi	Uusimaa	1
Porvoo	Uusimaa	6
Pukkila	Uusimaa	2
Sipoo	Uusimaa	8
Kemiönsaari	Southwest Finland	1
Laitila	Southwest Finland	3
Lieto	Southwest Finland	1
Mynämäki	Southwest Finland	15
Pöytyä	Southwest Finland	1
Salo	Southwest Finland	1
Taivassalo	Southwest Finland	1

Table 15. Numbers of samples collected from wild boars living in the wild and submitted for African swine fever testing by municipality in 2017. All samples tested negative for African swine fever.		
Uusikaupunki	Southwest Finland	2
Vehmaa	Southwest Finland	1
Total		**527**

Some cases of Trichinella found, no cases of *Echinococcus multilocularis*

Canine samples, meaning foxes and raccoon dogs, submitted to Evira are tested for *Echinococcus multilocularis*. Echinococcus multilocularis infections have never been detected in Finland, and Finland is considered a country free of Echinococcus multilocularis in the EU. In 2017, a total of 217 foxes and 339 raccoon dogs were tested for the parasite. The monitoring of *Echinococcus multilocularis* infections in Southern and Southwest Finland is conducted in cooperation with the regional offices of the Finnish Wildlife Agency. *Echinococcus canadensis*, whose intermediate hosts are cervids and definitive hosts are wolves, occurs in Eastern Finland (Eastern Lapland, Kuusamo, Kainuu, North Karelia). In 2017, the parasite was found in 17.5% of wolves (10 positive samples out of 57 examined). The positive samples were found in the parasite's typical area of distribution in Eastern Finland. Additionally, seven *Echinococcus canadensis* infections were identified in reindeer (see also Chapter 8 Reindeer diseases). Furthermore, two infections were diagnosed in elks, both in an area south of Oulu, which is west of the parasite's typical area of distribution.

Carnivorous mammals and birds are tested for the parasitic roundworms (*Trichinella* spp.) living in the muscle tissue. Trichinella worms are fairly common in the wild in Finland (Table B14). Bear samples are also tested for *Trichinella* in other approved laboratories, but any positive findings are confirmed at Evira.

The incidence of scabies (*Sarcoptes scabiei* mite) was slightly higher than in the previous year, with a total of 49 confirmed cases. Scabies infections were once again most commonly identified in raccoon dogs (31 cases) and foxes (14 cases). In addition to these, scabies infections were diagnosed in three lynxes and one wolf. The number of scabies cases in foxes was highest in Lapland (8 cases), while the raccoon dog cases were mainly centred around Southern and Southwest Finland. A few cases of scabies in foxes and raccoon dogs were also recorded in North Karelia. The lynxes were found in Southwest Finland and Häme, while the wolf was found in Ostrobothnia. Cases of scabies continued to be identified all year round.

Tularemia rare in the summer

In 2017, Evira received 25 blue hares and 70 brown hares for testing. Based on these tests, Evira confirmed a total of 10 cases of tularemia, all of them in brown hares. During the peak epidemic in the previous year, the majority of the cases occurred during the typical tularemia season in late summer and early autumn, but in 2017 only two of the cases occurred in the summer, while the rest were discovered in winter in January and February. The incidence of tularemia was highest in south-eastern Finland, in the Kymenlaakso area (6 cases). Two cases were discovered in the Oulu region, in addition to which one case each was recorded in Ostrobothnia and Satakunta. As such, the geographical incidence of tularemia was limited to known areas. Other infectious pathogens identified in hares included *Toxoplasma gondii* parasites (5 cases) as well as the bacteria *Yersinia pseudotuberculosis* (6 cases), *Pasteurella* *multocida* (2 cases) and *Listeria monocytogenes* (3 cases). All of these pathogens cause severe systemic infections in blue and brown hares, and infections occur annually in Finland.

Cause of death monitoring of large predators

The whole or partial carcasses of two wolverines, 38 lynxes, 21 wolves and 7 bears were submitted to the cause of death and disease monitoring programme for large predators. A total of one wolverine, 26 lynxes, five wolves and five bears were determined to have died or been injured in traffic accidents. Scabies infections were diagnosed in three lynxes and one wolf, with these being the only infectious diseases diagnosed in large predators. Four lynx cubs were found starved to death. One lynx that was found dead was determined to have died as a result of being shot. One young male lynx was determined to have been killed by another predator. A total of two bears that had been repeatedly spotted wandering near inhabited areas were shot with police permission. The bears were found to have been free of diseases and prior injuries. The number of wolves shot with police permission due to wandering near inhabited areas was five. The bodies of two of the wolves were found to contain encapsulated shotgun shots, while no abnormal findings were recorded in the other three. Furthermore, old gunshot wounds were identified in three wolves that had either been put down due to illness or found dead. In two of the cases, the injuries consisted of severe damage to internal organs or a limb that would not have been immediately lethal. The bodies of two wolves showed bruising, the cause of which could not be determined.

Zoonotic bacteria found once more in small birds

Avian chlamydiosis (*Chlamydophila psittaci*), a zoonotic, i.e. capable of infecting humans, bacterial disease, was diagnosed in three great tits, one yellowhammer, one bullfinch and one crow. All of the cases occurred in different locations around the country. One of the great tits had been cared for indoors. When the tit's caretaker contracted a respiratory infection with fever, both the great tit and the caretaker were sampled for avian chlamydiosis testing. *C. psittaci* bacteria were identified in both samples. This demonstrates that wild birds can transmit avian chlamydiosis to humans with prolonged, close contact. However, the risk of infection posed by birds visiting feeding sites is practically zero.

Cases of trichomonosis, an infection of the crop affecting small birds and caused by *Trichomonas gallinae* parasites, were identified in greenfinches and spruce siskins at six feeding sites in different parts of Finland during summer 2017. In January 2017, the disease was also diagnosed in a bullfinch and a European goldfinch in Southwest Finland. The parasite had not been previously identified in a European goldfinch in Finland.

Salmonella found in several bird species

The number of salmonella cases identified in wild birds was fairly high. At feeding sites, salmonellosis was found in yellowhammers, bullfinches, redpolls, siskins, greenfinches and chaffinches in nine different locations around Finland. Additionally, two birds of prey, a buzzard and a sparrowhawk, were diagnosed as salmonella carriers. Salmonella is also found every year in gulls, and in 2017 cases of the disease were identified in herring gulls at three locations and in black-headed gulls at two locations. Additionally, one barnacle goose found in Espoo was identified as a salmonella carrier. As regards mammals, salmonella was once again found in hedgehogs, in a total of five cases. Of these, four were emaciated or otherwise sick with the disease and one was in normal condition, having been killed in an accident. Additionally, one wild boar that was found dead was identified as a salmonella carrier. The majority of the salmonella strains found in wild animals were identified as *Salmonella enterica* ssp. *enterica* serotype Typhimurium. All of the strains isolated from hedgehogs were identified as serotype Enteritidis, which has also been common in Finnish hedgehogs in the past. Conversely, the strain carried by the buzzard and wild boar was identified as the rarer *Salmonella enterica* ssp. *diarizonae.*

Lead poisoning threatens swans and eagles

The number of birds found dead due to lead poisoning was relatively high in 2017, with lead poisoning determined as the cause of death of nine whooper swans, one mute swan, one golden eagle and seven white-tailed eagles. Cases of lead poisoning are identified in birds every year. Swans may inadvertently swallow lead shotgun shots to use as gastroliths, after which the shots start slowly melting in the bird's stomach. In 2017, molten lead shots of different sizes were found in the gizzards of two of the swans that were determined to have died of lead poisoning. Additionally, two swans had swallowed lead fishing weights. Eagles can end up ingesting a toxic amount of lead by eating the carrion of shot animals that contain lead shotgun shots or bullet splinters, for example. The lead then dissolves fairly rapidly in the raptor's stomach. Even so, the stomach of one white-tailed eagle was found to contain three undissolved lead shotgun shots.

Number of electronic reports of wild animals found dead remained stable

Wild animals that are found sick or dead can be reported on Evira's website, which is encouraged especially in cases where sending a sample of the animal is not possible. In many cases, the animal being reported is already partially eaten and no longer suitable for examination. In 2017, the number of reports submitted via the website was 214, roughly the same as in the previous year (205 reports). The majority of the reports (132) concerned birds, with whooper and mute swans being the most common species reported with 49 reports. The swan sightings submitted were fairly evenly distributed across the country and concerned individual birds. The frequency of reports was highest in the spring and summer, with the highest number of reports recorded in May (10 reports). In July-August, Evira received seven reports from Uusimaa concerning barnacle geese, of which Evira also received samples. A total of ten reports, six of which from Helsinki, were submitted concerning different species of gulls. A total of six reports concerned white-tailed eagles, of which four were from Southwest Finland. A total of five reports received in June-July concerned greenfinches or spruce siskins falling ill or dying in yard areas, usually during feeding. The symptoms described in these reports were indicative of trichomonosis. The number of reports received concerning hares (blue and brown hares) was 26, the majority of which (8) were from Uusimaa. Conversely, no reports were received concerning wild rabbits. Evira also received nine reports concerning otters, seven reports concerning raccoon dogs and another seven reports concerning elks.

Appendix A: Incidence of selected animal diseases in Finland

Table A1. Incidence of selected multiple species diseases in Finland.

Animal disease	Primary target animals	Zoonosis*	Last detected
Aujeszky's disease (pseudorabies)	Pig, ruminants, dog, cat		Never
Bluetongue disease	Ruminants		Never
Brucellosis		x	
• *B. abortus*	Ruminants		1960
• *B. melitensis*	Small ruminants		Never
• *B. suis*	Pig		Never
• *B. suis* bv.2	Wild boar		2016[1)]
Echinococcosis		x	
• *E. multilocularis*	Fox, raccoon dog, rodents		Never
• *E. canadensis*	Cervids, dog, wolf		2017
Heartwater	Ruminants		Never
Tularemia	Blue and brown hare, rodents, birds	x	2017
Rinderpest (cattle plague)	Ruminants		1877
Leptospirosis	Cattle, pig, horse, dog	x	2017[2)]
New world screwworm	Mammals	x	Never
Old world screwworm	Mammals	x	Never
Paratuberculosis	Ruminants		2008[3)]
Anthrax	Ruminants, pig, horse	x	2008
Q fever	Ruminants	x	2016[4)]
Rabies	Mammals	x	
• Rabies			1989
• Bat rabies			2017
Rift Valley fever	Ruminants	x	Never
Salmonella infections	Numerous different species	x	2017
Foot-and-mouth disease	Cloven-hoofed animals		1959
Trichinellosis		x	
• Production animals	Pig, farmed wild boar, horse		2017[5)]
• Others mammals	Predators, wild boar		2017
TSEs (Transmissible Spongiform Encephalopathies)		x	
• BSE	Cattle		2001
• Classical scrapie	Sheep, goat		2005[6)]
• Atypical scrapie	Sheep, goat		2016
• CWD	Cervids		Never
Vesicular stomatitis	Ruminants, horse, pig	x	Never
West Nile fever	Birds, horse	x	Never

*Zoonosis = disease that can be transmitted from animals to humans
1) In wild boars living in the wild
2) Clinical symptoms in two dogs
3) In a zoo animal
4) Antibodies on the same holding as in previous years
5) In a farmed wild boar
6) Has only occurred in Finland in goats

Table A2. Incidence of selected cattle diseases in Finland.	
Name of disease	**Last detected**
Haemorrhagic septicaemia	Never
Lumpy skin disease	Never
Malignant catarrhal fever (wildebeest)	Never
Mycoplasma bovis	2017
Bovine anaplasmosis	Never
Bovine genital campylobacteriosis (vibriosis)	Never
Bovine spongiform encephalopathy (BSE)	2001
Bovine viral diarrhoea (BVD)	2010
Enzootic bovine leukosis (EBL)	2008[1)]
Bovine tuberculosis	1982
Bovine babesiosis	2017
Theileriosis	Never
Contagious bovine pleuropneumonia (CBPP)	1920
Infectious bovine rhinotracheitis (IBR/IBV)	1994
Trichomonosis	1952
Trypanosomiasis (transmitted by the tsetse fly)	Never

1) Antibodies found in one artificial insemination bull in 2008 but no confirmed viral infection

Table A3. Incidence of selected pig diseases in Finland.	
Name of disease	**Last detected**
African swine fever	Never
Atrophic rhinitis	2001
Nipah virus encephalitis	Never
Porcine cysticercosis	Never
Swine influenza type A	2017
Swine fever	1917
Swine vesicular disease (SVD)	Never
Postweaning multisystemic wasting syndrome (PMWS)	2008[1)]
Porcine reproductive and respiratory syndrome (PRRS)	Never
Transmissible gastroenteritis (TGE)	1980

1) Clinical symptoms diagnosed on one holding

Table A4. Incidence of selected poultry and other bird diseases in Finland.	
Name of disease	**Last detected**
Duck virus hepatitis	Never
Avian pneumovirus (APV) infection (previously known as avian/turkey rhinotracheitis/swollen head syndrome (ART/TRT/SHS))	1999
Infectious bursal disease (IBD, also called Gumboro disease)	2014
Fowl cholera (*Pasteurella multocida*)	1993
Fowl typhoid (*S.* Gallinarum)	Never
Highly pathogenic avian influenza • Poultry • Other birds in captivity • Wild birds	 Never 2016 2017
Marek's disease	2017[1)]
Low pathogenic avian influenza	Never
Mycoplasma gallisepticum infection (avian mycoplasmosis)	2017[1)]
Mycoplasma meleagridis infection	Never
Mycoplasma synoviae infection (avian mycoplasmosis)	2017
Newcastle disease • Poultry • Other birds in captivity • PMV-1 infection in wild birds	 2004 2013 2017
Psittacosis, also known as parrot fever and ornithosis (avian chlamydiosis)	2015[1)]
Avian infectious laryngotracheitis (ILT)	2017[1)]
Avian infectious bronchitis (IB)	2017
Pullorum disease (*S.* Pullorum)	1961

1) Only in non-commercial poultry

Table A5. Incidence of selected sheep and goat diseases in Finland.	
Name of disease	**Last detected**
Sheep and goat pox	Never
Ram epididymitis (*Brucella ovis*)	Never
Maedi Visna (MV)	2006
Nairobi sheep disease	Never
Peste des petits ruminants (PPR)	Never
Salmonella abortus ovis	Never
Scrapie • Classical scrapie • Atypical scrapie	 2005[1)] 2016
Contagious agalactia	Never
Enzootic abortion in ewes (EAE), ovine chlamydiosis	Never
Caprine arthritis encephalitis (CAE)	Never
Contagious caprine pleuropneumonia	Never

1) Has only occurred in Finland in goats

Table A6. Incidence of selected aquatic animal diseases in Finland.	
Name of disease	**Last detected**
Epizootic haematopoietic necrosis (EHN)	Never
Infectious salmon anaemia (ISA)	Never
Infectious haematopoietic necrosis (IHN)	2017
Viral haemorrhagic septicaemia (VHS)	2012[1)]
Koi herpesvirus (KHV)	Never
Bacterial kidney disease (BKD) in inland water area	2016
Salmon fluke infection (*Gyrodactulus salaris*) in the conservation area of Upper Lapland	1996
Infectious pancreatic necrosis (IPN) in inland water area	2017[2)]
Salmonid alphaviruses (SAV)	Never
Spring viraemia of carp (SVC)	Never
White spot disease in crustaceans (WSD)	Never
Crayfish plague	2017[3)]
Marteiliosis in molluscs	Never
Bonamiosis in molluscs	Never

1) VHS restriction area of Åland
2) Genogroup 2 infection
3) In wild crayfish

Table A7. Incidence of selected horse diseases in Finland.	
Name of disease	**Last detected**
African horse sickness	Never
Dourine	Never
Equine encephalitis virus (WEE, EEE, VEE)	Never
Contagious equine metritis (CEM)	2017
Equine influenza	2012
Equine infectious anaemia (EIA)	1943
Equine piroplasmosis (EP)	2017[1)]
Equine rhinopneumonitis/equine viral abortion	2016
Glanders (malleus)	1942
Surra (*Trypanosoma evansi*)	Never
Equine viral arteritis (EVA)	2014[2)]

1) Imported horse
2) Increased antibody load in a clinically ill horse; not used for breeding

Table A8. Incidence of selected honey bee diseases in Finland.	
Name of disease	**Last detected**
American foulbrood	2017
European foulbrood	2017
Varroatosis	2017
Nosemosis	2017
Acarapis woodi (honey bee tracheal mite, acarapisosis)	2016
Small hive beetle (*Aethina tumida*)	Never
Tropilaelaps mites	Never

Appendix B: Data on animal disease surveillance programmes and other examinations conducted

This appendix collects data on animal disease surveillance conducted between 2008 and 2017, grouped by species.

Cattle

The results of cattle surveillance consist of the results of surveillance programmes based on the detection of antibodies, covering both dairy and suckler herds. All dairy cows in Finland were tested for IBR and leukosis until 2006 and for BVD until 2010. The programme to monitor Schmallenberg virus antibodies was launched in 2012 with the testing of blood samples collected from suckler cows, and expanded in 2013 and 2014 with the testing of bulk milk samples to provide information on the spread of the virus in Finland. The programme to monitor bluetongue disease was launched in 2007 and 2008. The testing of tank milk samples for bluetongue disease was discontinued in 2015, but the testing of suckler cow samples continued.

Table B1. Dairy cattle surveillance tests 2008–2017. No antibodies were detected.

Year	BVD		IBR	Leukosis	Bluetongue disease	Schmallenberg	
	Number of samples	Positive (%)	Number of samples	Number of samples	Number of samples	Number of samples	Number of pos. samples
2008	12,637	0.06	2,885	2,885	748		
2009	11,763	0.06	3,440	3,440	7,527		
2010	11,112	0.04	3,277	3,277	2,708		
2011	3,302	0.09 1)	1,449	1,449	860		
2012	2,963	0.10 1)	1,312	1,312	0 2)		
2013	1,800	0.05 1)	1,292	1,292	795	991	374
2014	1,277	0	1,277	1,277	849	615	108
2015	989	0	989	989	0	0	0
2016	920	0	920	920	0	0	0
2017	715	0	715	715	0	0	0

1) BVD seropositive sample, old infection.
2) The surveillance of bluetongue disease in dairy cattle was rescheduled to be conducted using samples collected in spring 2013.

Table B2. Serological testing of suckler cow herds between 2008 and 2017.								
Year	BVD		IBR	Leukosis	Bluetongue disease		Schmallenberg virus	
	Number of samples	Number of pos. samples	Number of samples	Number of samples	Number of samples	Number of pos. samples	Number of samples	Number of pos. samples
2008	3,507	1	3,507	0	2,624	0		
2009	3,524	0	3,524	0	2,337	0		
2010	4,108	0	4,108	0	2,626	0		
2011	4,661	1 1)	4,661	0	4,661	0		
2012	5,096	1 1)	5,096	0	5,096	0	1,093	93
2013	2,485	1 1)	2,485	0	2,485	1 2)	97	8
2014	7,915	1 3)	7,915	0	7,915	1 4)	0	0
2015	8,141	0	8,141	0	8,141	1 4)	0	0
2016	7,901	0	7,901	0	7,901	0	0	0
2017	6,885		6,885	0	6,885	0	0	0

1) BVD seropositive sample, old infection
2) BTV-14 seropositive Finnish suckler cow
3) BVD seropositive suckler cow imported from Denmark (seropositive already in the import tests in 1999)
4) BTV seropositive suckler cow imported from Sweden (seropositive already in the import tests in 2011)

Surveillance of brucellosis in different species

Table B3. Surveillance and health monitoring tests for brucellosis between 2008 and 2017. All test results were negative.					
Year	Sheep	Goat	Cattle		Pig
	Number of samples	Number of samples	Number of bulk milk samples	Number of blood samples	Number of samples
2008	3,474	1,459	0 1)	1,294	2,578 2)
2009	1,961	1,541	0 1)	1,411	2,395
2010	1,443	967	0 1)	1,307	2,816
2011	3,036	1,868	0 1)	823	2,079
2012	3,183	1,853	88 3)	1,245	2,126
2013	2,709	534	130	1,072	2,079
2014	4,156	160	869 4)	715	2,076
2015	4,501	6	929	681	1,297
2016	4,295	52	908	681	2,055
2017	3,856	16	91 3)	439	1,711

1) After several years of surveillance, it was decided to discontinue the testing of bulk milk samples to substantiate freedom from disease and to concentrate on the testing of clinical brucellosis cases.
2) The number of samples tested for brucellosis in pigs was reduced in 2008 when a shift was made to risk-based monitoring by focusing primarily on breeding animals instead of production animals in the collection of samples.
3) Dairy cattle bulk milk samples were tested in the context of artificial insemination operations.
4) In 2014, the monitoring tests of bulk milk samples were re-implemented in addition to the testing of bulk milk samples in the context of artificial insemination operations.

Transmissible spongiform encephalopathies (TSEs)

The only BSE case to occur in Finland was diagnosed in December 2001. The case was found in the monitoring of a cattle group at risk. As a result, the testing was expanded to also cover healthy cows. In accordance with the expanded testing programme, all cows over 24 months of age that were emergency slaughtered, spontaneously died or were killed and all slaughtered healthy cows over 30 months of age were tested until 31 December 2008. The age limit for the animals to be tested was raised in 2009 and 2011 after the risk of BSE had decreased. The testing of healthy cows ended entirely on 1 March 2013.

Table B4. Surveillance of BSE in cattle between 2008 and 2017. BSE was not detected in any of the samples.

Year	Number of samples tested*
2008	110,094
2009[1)]	72,145
2010	73,715
2011[2)]	56,187
2012	38,718
2013[3)]	15,911
2014	10,778
2015	11,576
2016	11,234
2017	11,596

* The numbers also include animals not covered by the mandatory testing programme.
1) The age limit of slaughtered cows to be tested was raised to 48 months on 1 January 2009.
2) The age limit of slaughtered cows to be tested was raised to 72 months on 1 July 2011.
3) BSE testing of healthy cows ended on 1 March 2014.

Table B5. Surveillance of scrapie in sheep and goats between 2008 and 2017.

Year	Sheep		Goat	
	Number of samples	Number of pos. holdings/samples	Number of samples	Number of pos. holdings/samples
2008	1,164	0/0	274	0/0
2009	1,143	0/0	350	1/1[1)]
2010	949	3/3[1)]	270	0/0
2011	1,251	0/0	217	0/0
2012	1,387	1/1[1)]	200	0/0
2013	1,431	1/1[1)]	276	0/0
2014	1,305	1/1[1)]	156	0/0
2015	1,325	0/0	149	0/0
2016	1,398	2/2[1)]	137	0/0
2017	1,673	0/0	205	0/0

1) Atypical scrapie (Nor98)

Table B6. TSE testing of other animals in 2017. TSE diseases were not found in any of the samples tested.	
Species	**Number of animals**
Companion animals	
Cat	75
Fur animals	
Mink	58
Fox	29
Raccoon dog	12
Captive animals	
Captive reindeer	16
Zoo animals	
Fallow deer (*Dama dama*)	1
Wild animals	
Elk (*Alces alces*)	48
White-tailed deer *(Odocoileus virginianus)*	23
Roe deer (*Capreolus capreolus*)	13
Finnish forest reindeer (*Rangifer tarandus fennicus*)	13
Total	**288**

Pigs

Table B7 contains the results of surveillance and health monitoring programmes, disease diagnosis and import tests. All test results were negative in 2017. Clinical leptospirosis has never been diagnosed in production animals in Finland. The results of brucellosis surveillance are presented separately (Table B3).

Table B7. Results of serological tests for viral diseases and leptospirosis in pigs between 2008 and 2017.

Year	**Aujeszky's disease**	**TGE**	**Swine fever**	**Leptos-pirosis** (pos. results in parentheses)	**Swine influenza** (pos. results in parentheses)	**SVD**	**PRRS**	**ASF**
2008	2,479	2,952	2,481	161 (2)	2,085	984	3,294	
2009	3,040	4,124	3,035	281 (0)	3,086 (484)	1,549	4,672	
2010	3,171	3,899	3,172	35 (0)	-	1,738	4,150	14
2011	2,599	2,883	2,818	100 (0)	-	1,264	3,754	128
2012	2,769	3,361	2,678	97 (0)	-	699	3,815	1,137
2013	2,649	2,986	2,429	39 (0)	-	26	4,058	1,178
2014	2,725	2,740	2,437	2 (0)	-	-	3,515	1,227
2015	2,320	2,332	2,050	0	-	-	2,909	180
2016	2,140	1,867	1,929	0	-	-	2,455	24*
2017	2,387	1,917	2,029	0	-	-	2,661	*

* Surveillance emphasises virological surveillance instead of serological surveillance.

Poultry

Table B8. Results of serological tests for viral diseases in poultry1) between 2008 and 2017. The table contains results of surveillance and health monitoring programmes, determinations of disease causes and import tests.

Year	Avian influenza		Newcastle disease		APV	
	Number of samples	Number of pos. holdings/samples	Number of samples	Number of pos. holdings/samples	Number of samples	Number of pos. holdings/samples
2008	2,035	1/2[2)]	8,317	1/40[3)]	8,317	0/0
2009	3,204	0/0	8,117	2/43[3)]	8,393	3/55[4)]
2010	3,175	0/0	8,325	3/61[3)5)]	8,416	4/21[5)]
2011	3,011	1/11[2)]	9,289	2/48[3)5)]	9,521	1/63[5)]
2012	3,223	2/8	10,423	3/42[3)5)]	10,078	1/60[5)]
2013	2,712	1/3[2)]	10,686	4/910[3)5)6)7)]	9,921	1/53[5)]
2014	4,318	2/12[2)]	11,606	6/249[3)5)]	5,933	3/17[5)]
2015	5,245	1/1[2)]	10,613	2/14[3)5)]	2,592[8)]	2/41[5)]
2016	3,902	0/0	9,177	4/10[3)5)]	1,728	3/43[5)]
2017	4,369	0/0	9,591	3/6[3)5)]	2,244	4/50[5)]

1) Poultry refers to all birds that are raised or kept in captivity for the production of meat or eggs and other products for consumption, introduction of wildfowl, or the breeding programmes of the previously mentioned birds.
2) H5 antibodies, RT-PCR negative, no symptoms.
3) Serology positive, RT-PCR negative, no symptoms.
4) Serology positive in preliminary tests. Confirmation tests did not provide further clarification.
5) Maternal (transferred from mother to offspring) antibodies in imported birds.
6) Vaccination antibodies in imported birds.
7) Serology positive, low pathogenic PMV-1 virus detected, no symptoms.
8) The EU surveillance programme for APV ended in 2015.

Sheep and goats

Table B9. Samples collected in the health control programme for Maedi Visna in sheep and CAE in goats between 2008 and 2017. Maedi Visna or CAE were not detected.

Year	**Sheep** Number of holdings tested	**Goat** Number of holdings tested	**Total number of samples**
2008	274	32*	19,904
2009	270	34*	18,472
2010	266	24	16,155
2011	287	30*	23,828
2012	324	39*	24,548
2013	317	35*	20,140
2014	111	9*	4,716
2015	111	4*	4,566
2016	106	6*	4,165
2017	75	2*	3,077

* Includes holdings that keep sheep in addition to goats.

Fish and crustaceans

Table B10. Surveillance of viral diseases in fish between 2008 and 2017.

Year	IHN, IPN, VHS		ISA		SAV	KHV	SVC	Number of fish farms where the virus was isolated.						
	Inland farm/tests[1]	Marine area farm/tests[1]	Inland farm/tests	Marine area farm/tests	Inland farm/tests	Inland farm/tests	Inland farm/tests[1]	IHN	IPN	VHS	ISA	SAV	KHV	SVC
2008	69/440	43/154					2/20	0	1[2)]	4[3)]	0	0	0	0
2009	73/318	51/177					3/5	0	3[2)]	6[4)]	0	0	0	0
2010	65/3,726	53/2,890					2/33	0	9[2)]	1[4)]	0	0	0	0
2011	44/2,588	38/1,256					1/12	0	6[2)]	2[4)]	0	0	0	0
2012	68/5,406	49/1,332	2/320	4/95				0	10[5)]	1[4)]	0	0	0	0
2013	55/3,740	46/1,870		1/20	35/1,050			0	18[6)]	0	0	0	0	0
2014	54/2,480	41/1,347	9/603		25/750			0	16[7)]	0	0	0	0	0
2015	62/2,570	45/1,382	1/60		45/1,179			0	23[8)]	0	0	0	0	0
2016	53/2,753	38/1,164	1/10		32/1,476			0	23[9)]	0	0	0	0	0
2017	55/2,591	18/991	7/240		30/1,500		2/25	4	29	0	0	0	0	0

1) Number of pools between 2000 and 2009. Number of fish from 2010 onwards. One pool contains the samples of approximately ten fish.
2) IPN was only found on marine area farms.
3) VHS was found on marine area farms in the restricted area of Åland and the restricted area of Uusikaupunki, Pyhäranta and Rauma.
4) VHS was found on marine area farms in the restricted area of Åland.
5) IPN was found on a total of ten farms, of which 6 (gr 2) were in inland water areas.
6) IPN was found on a total of 18 farms, of which 6 (gr 2) were in inland water areas.
7) IPN was found on a total of 16 farms, of which 6 (gr 2) were in inland water areas.
8) IPN was found on a total of 23 farms, of which 4 (gr 2) were in inland water areas.
9) IPN was found on a total of 23 farms, of which 11 (gr 2) were in inland water areas.
10) IPN was found on a total of 29 farms, of which 13 (gr 2) were in inland water areas

Table B11. Surveillance of bacterial kidney disease (BKD) in fish between 2008 and 2017.

Year	**Tests inland water area** farms/fish	**BKD cases** Inland water area
2008	80/4,375	7
2009	102/9,625	6
2010	80/5,164	4
2011	84/6,748	4
2012	79/5,830	3
2013	64/5,128	3
2014[1)]	73/4,627	2
2015	60/3,617	3
2016	71/3,910	1
2017	59/3,946	0

1) The programme to combat BKD switched to voluntary health monitoring on 1 December 2014.

Table B12. Surveillance of Gyrodactylus salaris between 2008 and 2017.

Year	**Teno River**[1)] Salmon	**Näätämö River**[1)] Salmon	**Paatsjoki River**[1)] Grayling	**Paatsjoki River, farmed fish** Salmon	Fish of the Salvelinus genus	**Tuuloma River**[1)] Grayling
2008	100	120	15	150	60	30
2009	100	122	15	150	60	53
2010	102	173	15		120	30
2011	65	156	15		120	30
2012	100	120	15		100	
2013	100	120	15		120	30
2014	100	120	15		120	30
2015	100	120	15		120	
2016	101	120	15		120	10
2017	30	120	15		60	

1) Samples collected from wild-caught fish.

Wildlife

Table B13. Surveillance of avian influenza in wild birds between 2008 and 2017. All viruses found before 2016 were low pathogenic.

Year	Number of birds tested	Positive samples (PCR/virus isolation)
2008	437	21/15
2009	384	23/18
2010	354	16/16
2011	86[1)]	0/0
2012	141	1/1
2013	133	0/0
2014	181[2)]	9/9[3)]
2015	133[4)]	1/0
2016	208	15/1[5)]
2017	316	7/0[5)]

1) Collection of samples from healthy birds ended in 2011.
2) Includes 70 healthy birds tested.
3) Of the positive results, 8 were healthy birds and one was a bird that was found dead.
4) Includes 2 healthy birds tested.
5) Virus isolation has not been conducted for all PCR positive birds.

Table B14. Occurrence of Trichinella spp. in Finnish wildlife in 2017.

Species	Number of Trichinella positive animals	Number of animals tested	Proportion of positive animals	Incidence between 2005 and 2015
raccoon dog	91	225	40.4%	33.0%
fox	49	110	44.5%	23.5%
badger	5	16	31.3%	8.7%
pine marten	2	8	25.0%	11.3%
otter	4	51	7.8%	5.0%
bear	10	100	10.0%	6.1%
lynx	12	37	32.4%	44.9%
wolf	30	57	53%	33.9%
wolverine	2	0	0%	56.3%
goshawk	2	26	7.7%	2.3%
wild boar	4	132	3.0%	5.1%

Appendix C: Numbers of animal holdings and animals in Finland in 2017

Table C1. Numbers of animal holdings and animals.			
Terrestrial animals	**Animals**		**Holdings**
Cattle	894,475		11,528
Pigs (commercial production)	1,120,168		1,223
Non-commercial pigs			551
Bison	261		15
Sheep	144,206		3,936
Goats	7,803		962
Cervids (reindeer)	193,142		4,430
Honey bees	67,000		7,201
Laying hens	4,051,203		1,025
Broilers	6,945,600		367
Other commercial poultry			1,240
Non-commercial poultry			6,896
Camelids			168
Horses	74,200		16,000
Dogs	800,000		
	Production quantity in tonnes		
Aquatic animals	**Farmed[1)]**	**Wild[2)]**	**Farms**
Fish	14,400	192,900	400
Crayfish	0.88	131.61	47

1) Farmed = from aquaculture
2) Wild = wild-caught

Appendix D: Disease-free statuses and additional guarantees granted to Finland

Table D. Disease-free statuses and additional guarantees granted to Finland.

Animal disease	Status	Valid decision	EU/ OIE*
African horse sickness	Disease-free	Resolution 21.	OIE
Aujeszky's disease (pseudorabies)	Disease-free, resulting in additional EU guarantee	2008/185/EC	EU
Brucellosis (*Brucella abortus*)	Disease-free	2003/467/EC	EU
Brucellosis (*Brucella melitensis*)	Disease-free	2001/292/EC	EU
BSE	Negligible risk	Resolution 20.	OIE
Echinococcus multilocularis	Disease-free	(EU) 1152/2011	EU
Gyrodactylus salaris	Disease-free in the Teno and Näätämö river basins. The Paatsjoki, Tuulomajoki and Uutuanjoki river basins are part of the buffer zone	2010/221/EC	EU
Rinderpest (cattle plague)	Disease-free	Resolution 22. (and 18/2011)	OIE
Spring viraemia of carp (SVC)	Disease-free	2010/221/EC	EU
Classical scrapie	Negligible risk	2016/1396/EC	EU
Classical swine fever (CSF)	Disease-free	Resolution 23.	OIE
Infectious salmon anaemia (ISA)	Disease-free	2009/177/EC	EU
Salmonid alphaviruses (SAV)	Disease-free in the inland water area	2010/221/EC	EU
Enzootic bovine leukosis (EBL)	Disease-free	2003/467/EC	EU
Bovine tuberculosis	Disease-free	2003/467/EC	EU
Newcastle disease	A country in which vaccination against Newcastle disease is not conducted	94/963/EC	EU
Peste des petits ruminants (PPR)	Disease-free	Resolution 22.	OIE
Salmonella infections	Additional guarantee	2003/644/EC (breeding poultry and day-old chicks for introduction into flocks of breeding poultry or flocks of productive poultry) 2004/235/EC (laying hens) 95/410/EC (poultry for slaughter)	EU

Table D. Disease-free statuses and additional guarantees granted to Finland.			
		(EC) 1688/2005 (meat and eggs)	
Foot-and-mouth disease	Disease-free	Resolution 16.	OIE
Infectious bovine rhinotracheitis (IBR/IBV)	Disease-free, resulting in additional EU guarantee	2004/558/EC	EU
Infectious pancreatic necrosis (IPN gr 5)	Disease-free in the inland water area	2010/221/EC	EU
Infectious haematopoietic necrosis (IHN)	Disease-free status under review due to cases reported in 2017	2009/177/EC	EU
Transmissible gastroenteritis (TGE)	Disease-free, resulting in additional EU guarantee	48/94/COL	EU
Varroa	Disease-free in the Åland Islands	2013/503/EC	EU
Viral haemorrhagic septicaemia (VHS)	Disease-free except in Åland Islands	2009/177/EC	EU

*OIE = World Organisation for Animal Health

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