2 Domestic animal infectious disease surveillance

2-1 Brucellosis (cattle)

What is Brucellosis?

Brucellosis is a disease of cattle, goats, sheep, pigs, buffaloes, deer, and wild boar caused by *Brucella* species (*Brucella abortus, B. melitensis, B. suis*), designated as a Domestic animal infectious disease in Japan. It is also recognized as a zoonotic disease because the pathogen is also infective to humans. In pregnant cows, the disease is characterized by abortions and stillbirths caused by placentitis, and mastitis and arthritis may also be observed. In the case of bulls, orchitis and epididymitis may be observed.

Japan confirmed the free status of this disease in cattle herds through the nationwide surveillance conducted during FY2018-2020.

Objectives and methods of surveillance

Since cattle herds in Japan have already been qualified as free from the disease, the surveillance is now being conducted aiming to maintain free status. Target animals for surveillance are imported cattle, bulls subject to seedstock inspection, and cattle that have experienced abortion or stillbirth. In case a positive result is obtained by a screening test, confirmatory tests will be conducted.

(1) Surveillance of imported cattle

Cattle that have been imported at least one year ago for the sake of breeding and/or milking are tested.

(2) Surveillance of bulls

Bulls used for breeding or semen collection and subject to seedstock inspection stipulated in the Act on Improvement and Increased Production of Livestock are tested. Note that the bulls that were targeted for the surveillance in the previous year were excluded.

(3) Surveillance of cattle that experienced abortion or stillbirth

Cattle that have experienced abortion or stillbirth are tested. When possible, aborted fetuses are also tested.

Surveillance results

In FY2022, 255 imported cattle, 700 bulls subject to seedstock inspection, and 270 cows that experienced abortion or stillbirth were tested, and all results were negative.

Table2-1-1 Number of brucellosis cases

	2020	2021	2022
(farms)	0	0	0
(animals)	0	0	0

Table2-1-2 Brucellosis surveillance of cattle in FY2022

Target cattle	# of cattle tested	# of negative	# of positive
Imported cattle	255	255	0
Bulls subject to seedstock inspection	700	700	0
Cows experienced abortion or stillbirth*	270	270	0

* Numbers indicated here are total numbers of samples since some animals experienced more than one abortion or stillbirth during the same fiscal year

2-2 Tuberculosis (cattle)

What is Tuberculosis?

Tuberculosis is a chronic respiratory infectious disease caused mainly by *Mycobacterium bovis* (*M. bovis*) and is designated as a Domestic animal infectious disease of cattle, goats, buffalo, and deer. *M. bovis* has a wide host range, including humans; thus, the disease is recognized as a zoonosis. The disease's incubation period ranges from several months to several years, and infected animals generally do not show any particular clinical signs until the disease progresses. In advanced cases, animals show respiratory symptoms such as coughing and dyspnea, and their general condition deteriorates, leading to death.

Japan confirmed the free status of this disease in cattle herds through the nationwide surveillance conducted during FY2018-2020.

Objectives and methods of surveillance

Since cattle herds in Japan have already been qualified as free from the disease, surveillance is now being conducted aiming to maintain free status. The surveillance targets imported cattle and bulls subject to seedstock inspection. In case a positive result is obtained by the screening test, confirmatory tests will be conducted.

(1) Surveillance of imported cattle

Cattle that have been imported at least one year ago for the sake of breeding and/or milking are tested.

(2) Surveillance of bulls

Bulls used for breeding or semen collection and subject to seedstock inspection based on the Act on Improvement and Increased Production of Livestock are tested. Note that the bulls that were targeted for surveillance in the previous year were excluded.

Surveillance results

In FY2022, 251 imported cattle and 700 bulls subject to seedstock inspection were tested, and all results were negative.

Table2-2-1 Number of tuberculosis cases

	2020	2021	2022
(farms)	0	0	0
(animals)	0	0	0

Table2-2-2 Tuberculosis surveillance of cattle in FY2022

Target cattle	# of cattle tested	# of negative*	# of positive
Imported cattle	251	251	0
Bulls subject to seedstock inspection	700	700	0

* Number of negatives includes cattle with a positive result in the screening test and a negative result in the confirmatory tests or definitive tests performed later.

2-3 Johne's disease (cattle)

What is Johne's disease?

Johne's disease is a disease caused by infection with *Mycobacterium avium subsp. Paratuberculosis* (*MAP*). The disease is designated as a Domestic animal infectious disease of cattle, sheep, and goats. The main clinical signs are chronic, persistent diarrhea, weight loss, and decreased milk production. The disease has a long incubation period and persists for several months to years without apparent symptoms until the onset of the disease. *MAPs* are excreted in the feces of infected animals and spread the disease in the herd. There is no vaccine or treatment available.

The disease is present in Japan, and efforts to prevent the spread of the disease are made following the guidelines on measures against bovine Johne's disease.

Objectives and methods of surveillance

Johne's disease is a contagious disease characterized by a long incubation period, and the main countermeasures taken are to detect and cull infected cattle through periodic inspections. The target of the periodic inspections is breeding cattle that have been kept for a long period. For the farms where infection has been confirmed, follow-up tests to assess disease status and pre-transfer inspection are conducted on cattle before shipment from the farm.

(1) Periodic inspection

At least once every five years, periodic inspections are conducted on cows used for breeding and/or milking.

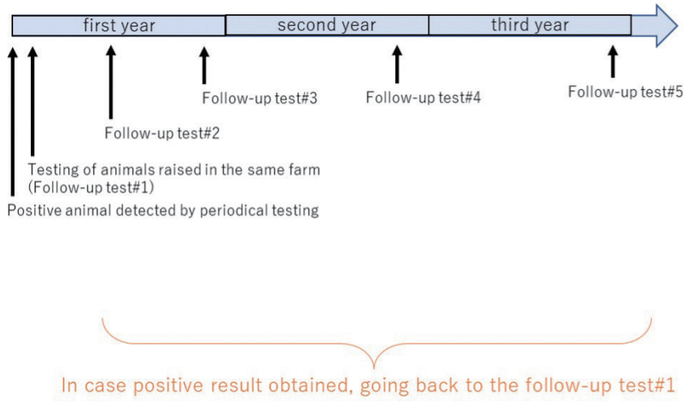
(2) Follow-up tests on infected farms

For farms where an infection has been confirmed, follow-up tests are conducted at least three times a year for the first year and then once a year for the following two years, which counts at least five times in three years.

(3) Pre-transfer inspection on infected farms

Tests are conducted before shipment when cattle are shipped from the infected farms.

Fig. 2-3-1 Time schedule for periodic inspection and follow-up tests



Surveillance results

Johne's disease surveillance is conducted through a combination of ELISA testing using serum, skin tests, real-time PCR of fecal samples, and fecal culture. A cumulative total of 684,206 cattle were tested for Johne's disease in 2022.

Figure2-3-2 Cattle with Johne's disease showing weight loss lower right: Cross-section of the intestinal tract of the cattle with Johne's disease (left) and healthy cattle (right)

Photo courtesy of NIAH, NARO

Table2-3-1 Number of Johne's disease cases

	2018	2019	2020	2021	2022
(farms)	321	380	399	446	519
(animals)	831	1,066	809	957	1,147

Table2-3-2 Johne's disease surveillance for cattle conducted in 2022

test type	total number of animals tested*
ELISA (serum)	561,229
Johnin reaction	1,016
Fecal PCR	30,968
Fecal culture	90,993
total	684,206

* Surveillance includes periodic inspection, follow-up tests, and pre-transfer inspection on infected farms. Multiple tests may be conducted on the same individual.

Photo courtesy of NLBC Niikappu station

2-4 Bovine spongiform encephalopathy (BSE)

What is BSE?

Bovine Spongiform Envcephalopathy (BSE) is a prion disease of cattle that was first identified in the United Kingdom in 1986, and the disease was first confirmed in Japan in September 2001. Cattle infected with abnormal prion protein develop the disease after a long incubation period of several years and show behavioral abnormalities and incoordination, leading to death after a lapse of two weeks to six months. The disease is transmitted to cattle via feed contaminated with abnormal prion protein. Thus a feed ban is implemented in order to prevent the feeding of potentially contaminated feed to ruminants. In Japan, no new outbreaks have been reported since January 2009, and in May 2013, Japan was officially recognized by WOAH as a country with "negligible risk."

Objectives and methods of surveillance

MAFF conducts BSE surveillance on cattle that have died on farms or the cattle exhibiting clinical signs to confirm the effectiveness of control measures such as feed regulations and to maintain international recognition as BSE-free. The cattle to be tested are as follows;

(1) Cattle that died at 96 months of age or older
(2) Cattle 48 months of age or older that exhibited incoordination and difficulty in rising before death (downer cattle)
(3) Cattle exhibit progressive behavioral changes or unexplained neurological symptoms prior to death, regardless of age (cattle with specific clinical signs)

At slaughterhouses, BSE screening tests are conducted on cattle aged 24 months or older that exhibit neurological symptoms and other relevant clinical signs. The results are published by the Ministry of Health, Labor and Welfare on its website.
https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/kenkou_iryou/shokuhin/bse/screening.html

Surveillance results

In FY2022, testing was conducted on 20,932 dead cattle and all results were negative.

Fig.2-4-1 Number of BSE cases by year

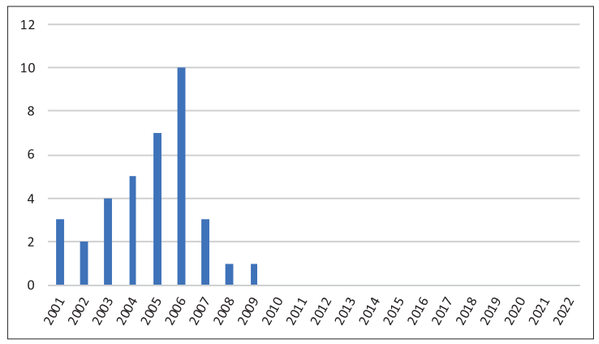


Table2-4-1 BSE surveillance conducted in FY2022

	# of tested
Ordinal dead cattle	13,573
Downer cattle	7,292
Cattle with specific clinical signs	67

2-5 Transmissible spongiform encephalopathy (scrapie)

What is transmissible spongiform encephalopathy?

Scrapie of sheep and goats, like BSE and chronic wasting disease of deer, is a prion disease caused by an abnormal prion protein. They are collectively called transmissible spongiform encephalopathy (TSE) in livestock and designated as a Domestic animal infectious disease. Scrapie in sheep and goats has been known for over 250 years, and sporadic outbreaks have been reported in Japan. Unlike BSE, which is transmitted through feed contaminated with abnormal prion protein, the route of transmission of scrapie is unknown.

Objectives and methods of surveillance

In order to detect infected sheep and goats on farms, TSE tests are conducted on dead or culled sheep and goats at 12 months of age and older and sheep and goats with specific clinical signs such as itching sensation.

Surveillance results

In FY2022, testing was conducted on 212 sheep and 436 goats and all results were negative.

2-6 Classical swine fever

What is classical swine fever?

Classical swine fever (CSF) is a contagious viral disease of pigs and wild boars caused by the classical swine fever virus. The disease is highly contagious and has no treatment; thus it is designated as a Domestic animal infectious disease. The disease is transmitted through direct or indirect contact with infected animals, including nasal secretion and feces of infected animals. Infected animals develop a variety of clinical signs ranging from acute cases with fever, leukopenia, anorexia, cyanosis of the auricle, and death in a short period to those with a long-term course. The strain currently prevalent in Japan is considered to be moderately virulent and less likely to show severe symptoms.

In Japan, an outbreak was confirmed in September 2018 for the first time in 26 years at a domestic pig farm, and later infection in wild boars was also confirmed. Currently, reflecting the spread of infection in wild boars, vaccination of domestic pigs in the designated area and distribution of oral vaccine to wild boars are being conducted.

Methods and results of surveillance

Surveillance on domestic pigs and wild boars is conducted for early detection of CSF.

<Domestic pigs>

(1) Surveillance Methods

In addition to the inspections conducted in response to notifications for suspicion of CSF, antibody tests targeting non-vaccinated farms and antigen tests using swine samples submitted for pathological appraisal.

①Periodic on-site inspections of farms

In principle, the livestock hygiene service center (LHSC) in each prefecture conducts on-site inspections at the pig farm once a year to check the clinical condition. If abnormalities such as cyanosis or fever are observed, CSF testing is conducted.

②Antibody test

Antibody tests targeting pigs in non-vaccinated farms are conducted to detect infection.

③Antigen test of samples submitted for pathological appraisal

When pathological appraisal was conducted by LHSC upon request of producers, samples are also tested for CSF.

(2) Surveillance results

①Periodic on-site inspections of farms

In FY2022, on-site inspections were conducted on 4,001 farms and no abnormalities were found.

②Antibody test

In FY2022, 11,365 pigs from 433 non-vaccinated farms were tested, and all results were negative.

③Testing of samples submitted for pathological appraisal

In FY2022, tests were conducted on samples collected from 1,676 pigs in 455 farms, with all results negative for CSF.

<Wild boars>

(1) Surveillance Methods

Wild boars that were dead and those captured are tested for CSF.

(2) Surveillance results

The number of wild boars tested for CSF has been increasing, reflecting the expansion of CSF-infected areas; in FY2022, 780 dead boars and 28,213 captured boars were tested, with 289 (37.1%) and 904 (3.2%) being PCR positive, respectively. Infected wild boars were detected in 27 prefectures until FY2021, and in FY2022, infected boars were newly confirmed in 7 more prefectures, bringing the total to 34 prefectures.

A map showing the latest status of CSF in wild boar and a detailed survey analysis is available on the MAFF website.

https://www.maff.go.jp/j/syouan/douei/csf/

Table 2-6-1 Number of CSF outbreaks

	2018	2019	2020	2021	2022
# of cases	6	45	10	15	9

Table2-6-2 Surveillance (antibody test) in domestic pigs in FY2022

# of farms	# of animals tested		# of positive by antibody Tests	# of confirmed CSF
	sows	feeders		
433	3,680	7,685	3	0

Fig.2-6-1 Prefectures with CSF outbreaks in domestic pigs, prefectures with CSF-positive cases in wild boar, and prefectures recommended to vaccinate domestic pigs as of the end of FY2022.

Prefectures with CSF outbreaks in domestic pigs: Red (no outbreak in Red-shaded since FY2022.)
[18 prefectures] (2,662,550 pigs (29.8% of the national total) *)
Prefectures with CSF-positive cases in wild boar: Red (except Okinawa), Orange
[34 prefectures] (4,028,930 pigs (45.0% of the national total) *)
Prefectures recommended to vaccinate domestic pigs: Red, Orange and Yellow
[39 prefectures] (4,028,930 pigs (60.6% of the national total) *)
*Data are based on the Statistical Survey on Livestock in 2022

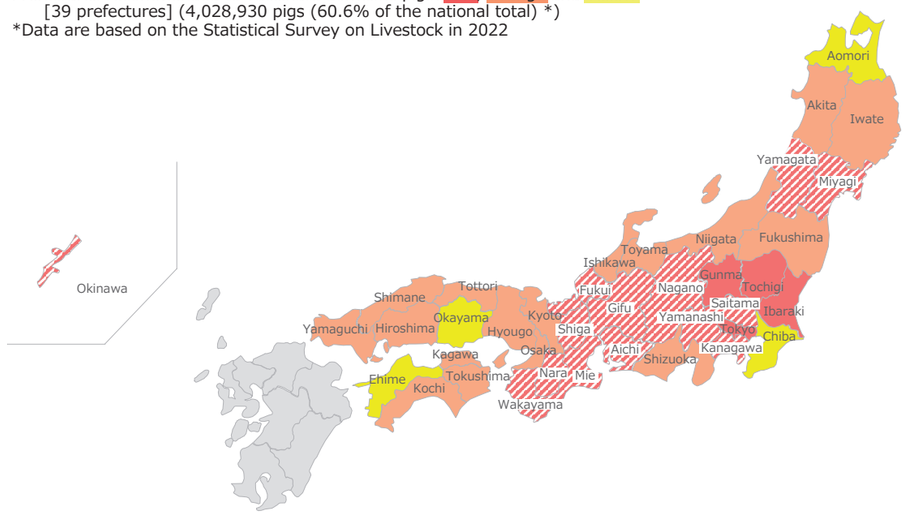


Fig.2-6-2 Surveillance on wild boars (PCR) in FY2022

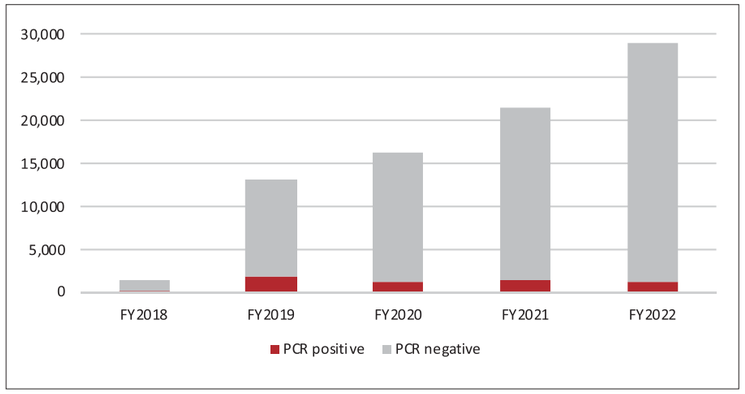
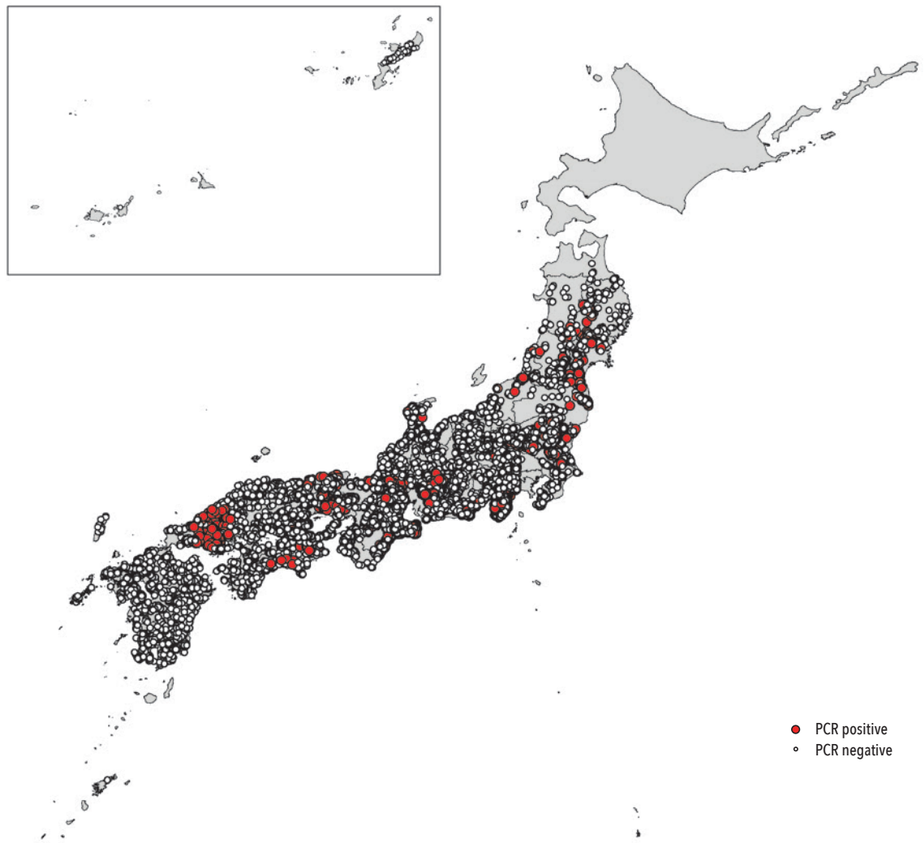


Fig. 2-6-3 Distribution of wild boars tested for CSF in FY2022



2-7 African swine fever

What is African swine fever?

African swine fever (ASF) is a contagious disease of pigs and wild boars characterized by fever and systemic hemorrhagic lesions caused by African swine fever virus infection. Due to its high mortality without any treatment or available vaccine, the anticipated impact on the livestock industry is enormous once it occurs, so the disease is designated as a Domestic animal infectious disease in Japan.

ASF had been enzootic in the African region, but since after the infection spread to Europe in 2007, the infected area has been expanding. Concerning the Asian region, the first outbreak was reported in China in August ,2018, and since then, the infection has been spreading in the region. To date, there have been no outbreaks in Japan, and Japan is increasing vigilance against the introduction of the disease from overseas. (see Special Feature 2).

Surveillance methods and results

Surveillance of domestic pigs and wild boars is conducted to monitor the invasion and occurrence of ASF in Japan.

<Domestic pigs>

(1) Surveillance Methods

As well as CSF surveillance, antigen tests are conducted using samples derived from domestic pigs and submitted for pathological appraisal.

①Periodic on-site inspections of farms

LHSCs in each prefecture conducts on-site inspections at swine farms once a year in principle to check the clinical condition. If abnormalities such as cyanosis or fever are observed, ASF testing is conducted in addition to CSF testing.

②Testing of samples submitted for pathological appraisal

When pathological appraisal was conducted by LHSC upon request from producers, samples are also tested for ASF in addition to CSF.

(2) Surveillance results

①Periodic on-site inspections of farms

In FY2022, on-site inspections were conducted on 4,001 farms, and no abnormalities were found.

②Testing of samples submitted for pathological appraisal

In FY2022, tests were conducted on samples collected from 1,542 animals in 439 farms, with all results negative for ASF.

<Wild boars>

(1) Surveillance Methods

Tests for ASF were conducted on wild boars found dead and part of those captured, which were collected for testing for CSF.

(2) Surveillance implementation status

In FY2022, 715 dead boars and 24,078 captured boars were tested, with all results negative for ASF.

2-8 Highly pathogenic and low pathogenic avian influenza

What is Avian Influenza?

Avian influenza is a disease of avian species caused by influenza A viruses. According to the Act on Domestic Animal Infectious Disease Control, the disease is classified into three types depending on virulence and probability of mutation. "Highly pathogenic avian influenza (HPAI)" is defined as the highly virulent type with a high fatality rate, and "Low pathogenic avian influenza (LPAI)" is infection H5 and H7 subtype viruses but low virulent type. Other avian influenza subtypes are classified as "avian influenza."

HPAI outbreaks (subtype H5) occur worldwide, and in Japan, a number of HPAI outbreaks are observed from late fall to early spring (see Special Feature 1).

On the other hand, in the case of LPAI, although the disease itself is highly contagious, infected poultry rarely shows clinical signs that delay detection. In other countries, mutations from LPAI into HPAI have been reported.

There is no treatment for infected birds, and a stamping-out policy is applied once an infection is confirmed on a poultry premise. Early detection and notification of infected poultry are essential to prevent the spread of disease.

Surveillance Methods

In addition to passive surveillance, in which diagnostic testing is conducted in response to the reporting of unusual conditions such as increased mortality, two types of active surveillance are conducted to detect infection.

(1) Fixed-point surveillance

Farms with a relatively high risk of infection, such as those located near stopover sites of migratory birds, are selected for continuous monitoring. Selected farms are tested for avian influenza (virus isolation and serum antibody test) once a month.

(2) Enhanced surveillance

Serum antibody tests are conducted on selected farms from October to May of the following year, the migration season for wild birds. Farms are selected based on the number of farms in each prefecture.

Surveillance results

All samples collected either in fixed-point surveillance or enhanced surveillance from January to December 2022 were negative for avian influenza. In addition, for early detection of avian influenza, the Ministry of the Environment is conducting wild bird surveillance for avian influenza by testing the feces and carcasses of wild birds, especially waterfowl in winter.
https://www.env.go.jp/nature/dobutsu/bird_flu/

Table 2-8-1 Number of avian influenza outbreaks in poultry

	2020	2021	2022
HPAI*	33	29	66
LPAI	0	0	0

*If winter to the following spring is defined as a "season", the number of outbreaks during the season is as follows.
2020-2021 season: 52 cases
2021-2022 season: 25 cases
2022-2023 season: 84 cases

Table2-8-2 Avian influenza surveillance in 2022

		# of farms	# of birds
Fixed point surveillance	Virus isolation	5,394	53,950
	Antibody test	4,913	50,020
Enhanced surveillance	Antibody test	1,327	13,247

2-9 Arbovirus infection in cattle

What is arbovirus infection in cattle?

Arbovirus infection is a general term to describe viral infections transmitted to humans and livestock by infected arthropods such as mosquitoes, ticks, and biting midges. Most arbovirus infections in cattle are transmitted by tiny blood-sucking insects called *Cullicoides* biting midges. The major arbovirus infections in cattle in Japan are Akabane disease, Aino virus infection, Chuzan disease, Ibaraki disease, bovine ephemeral fever, and bluetongue. Akabane disease, Aino virus infection, and Chuzan disease are associated with abortions, miscarriages, premature births, stillbirths, and births with congenital abnormalities when pregnant cows are infected with the viruses. In addition, some strains of the virus that cause Akabane disease infect calves and develop neurological clinical signs such as paralysis associated with encephalomyelitis, which is called postnatal infection. Both Ibaraki disease and bovine ephemeral fever cause various clinical signs associated with fever when infected. In particular, Ibaraki disease is characterized by difficulty in swallowing, while bovine ephemeral fever is characterized by the inability to stand and decreased milk production. Cattle affected with bluetongue develop erosions and ulcers on the tongue, lips, nasal cavity, and oral mucosa. In cattle, the infection is often subclinical. It is more likely to develop clinical signs in sheep. These arbovirus infections are most likely to occur during summer and fall when blood-sucking insects are more active.

Table2-9-1 Number of cattle infected with arbovirus

		2020	2021	2022
Akabane disease (perinatal infection)	(farms)	1	0	1
	(animals)	1	0	1
Akabane disease (postnatal infection)	(farms)	0	0	0
	(animals)	0	0	0
Aino virus infection	(farms)	0	0	0
	(animals)	0	0	0
Chuzan disease	(farms)	0	0	0
	(animals)	0	0	0
Ibaraki disease	(farms)	0	0	0
	(animals)	0	0	0
Bovine ephemeral fever	(farms)	0	0	0
	(animals)	0	0	0
Bluetongue(cattle)	(farms)	0	0	0
	(animals)	0	0	0
Bluetongue(sheep)	(farms)	2	2	0
	(animals)	6	5	0

Objectives and methods of surveillance

Arboviruses are considered to be introduced into Japan each season by vectors carrying the virus, which travel on wind currents from the East and Southeast Asian region. Thus, surveillance is intended to detect the entry of the virus into Japan at an early point, thereby enabling increasing awareness, facilitating vaccination, supporting proper diagnosis for abortions, and taking other countermeasures. Surveillance is conducted in the following two ways.

(1) Sero-surveillance

Arbovirus infections are more likely to occur from summer to fall when blood-sucking insects are more active. Thus, a total of four consecutive antibody tests are conducted from June to November in order to assess the entry of the disease by looking at seroconversion. The target diseases are Akabane disease, Aino virus infection, and Chuzan disease. Based on the current disease situation, surveillance is conducted throughout Japan for Akabane disease, and in western Japan for Aino virus infection and Chuzan disease.

(2) Virus antigen surveillance

Virus antigen surveillance using PCR is conducted in Kyushu and Okinawa regions, where arboviruses are more likely to be introduced, to detect virus invasion earlier than by sero-surveillance. The target diseases are Akabane disease, Aino virus infection, Chuzan disease, Ibaraki disease, and bluetongue (Table 2-9-2). In the target prefectures, a total of four consecutive PCR tests are conducted from June to November.

Surveillance results

(1) Sero-surveillance

In FY2022, sero-surveillance was conducted on 2,606 cattle from 831 farms. Positive antibody results for Akabane disease were confirmed in Okinawa in September and in Hokkaido and Kumamoto in November (Fig. 2-9-1). The occurrence of Akabane disease was also reported in Hokkaido, in the northern part of Japan, in December. This is the first report of Akabane disease in Hokkaido since 2010-2011.

Positive antibody results for Chuzan disease were confirmed in Ehime in September and in Okayama, Kochi, Nagasaki, Kumamoto, and Okinawa in November (Fig. 2-9-2). As D'Aguilar virus (DAGV) was isolated from a seroconverted cattle in Nagasaki, these seroconversions observed in the western Japan are likely to be caused by the DAGV infection, which is closely related to Chuzan virus.

A positive antibody result for Aino virus infection was confirmed in Yamaguchi in November (Fig. 2-9-3).

(2) Virus antigen surveillance

In FY2022, virus antigen surveillance was conducted on 150 cattle from 61 farms. In Okinawa, the southern islands of Japan, PCR positive results were confirmed for a Simbu serogroup virus in July and for bluetongue virus in July and November (Fig. 2-9-4). The results of genetic analysis showed that the viral genes of the Simbu serogroup virus detected were identified as those of the Sathuperi virus.

The bovine arbovirus infection surveillance results conducted in previous years can be found below.
https://www.naro.go.jp/laboratory/niah/arbo/index.html

Table 2-9-2 Arboviruses subject to surveillance

Virus group	Virus (Viruses subject to genetic surveillance underlined)
Simbu serogroup virus	Akabane virus, Aino virus, Peaton virus, Sathuperi virus, Shamonda virus
Epizootic hemorrhagic disease virus	Epizootic hemorrhagic disease viruses including Ibaraki disease virus
Palyam serogroup virus	Chuzan vius, D'Aguilar virus
Bluetongue virus	Bluetongue viruses

Fig.2-9-1 Results of sero-surveillance for Akabane disease in FY2022

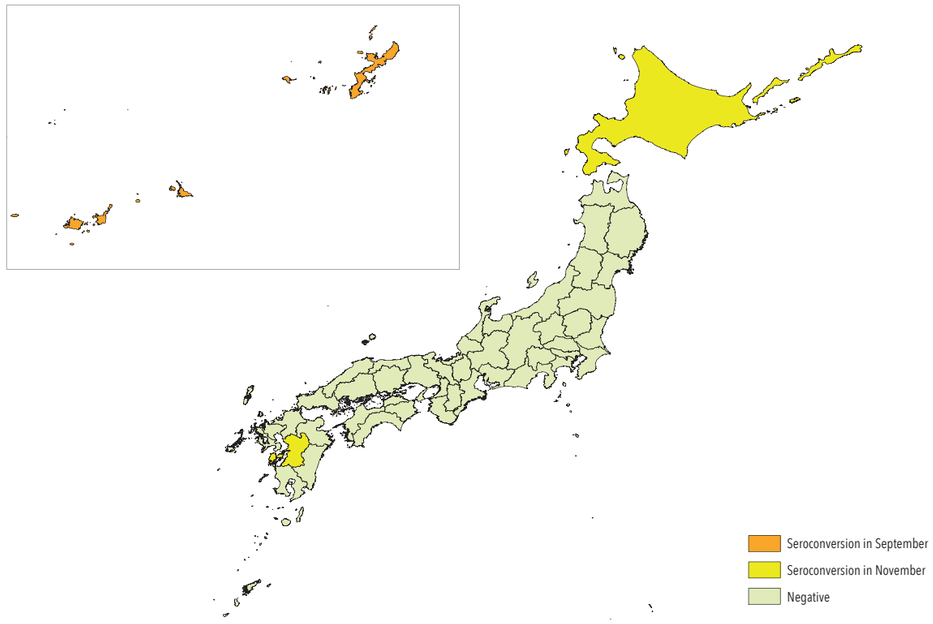


Fig.2-9-2 Results of sero-surveillance for Chuzan disease in FY2022

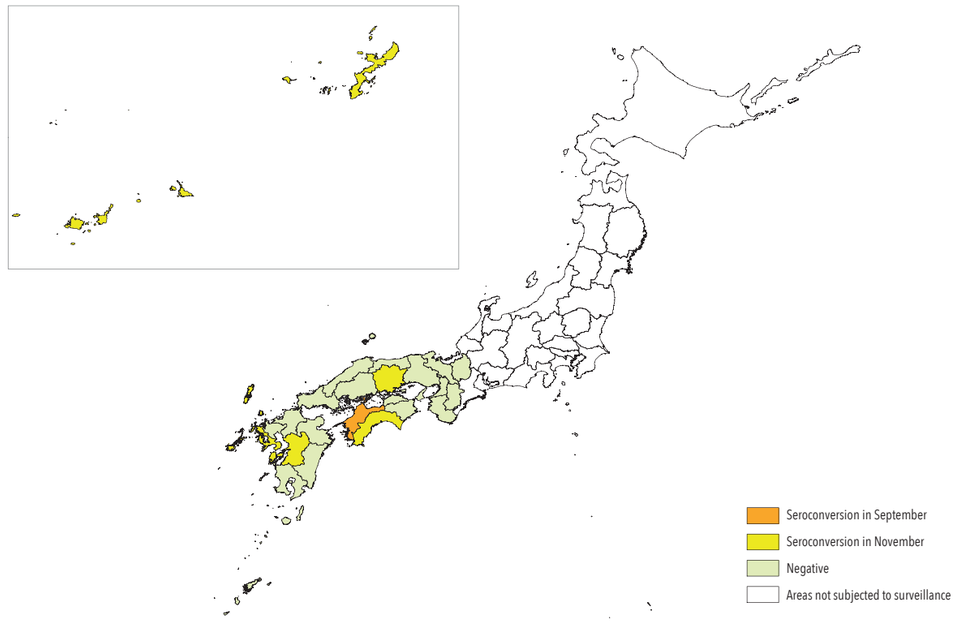


Fig.2-9-3 Results of sero-surveillance for Aino virus infection in FY2022

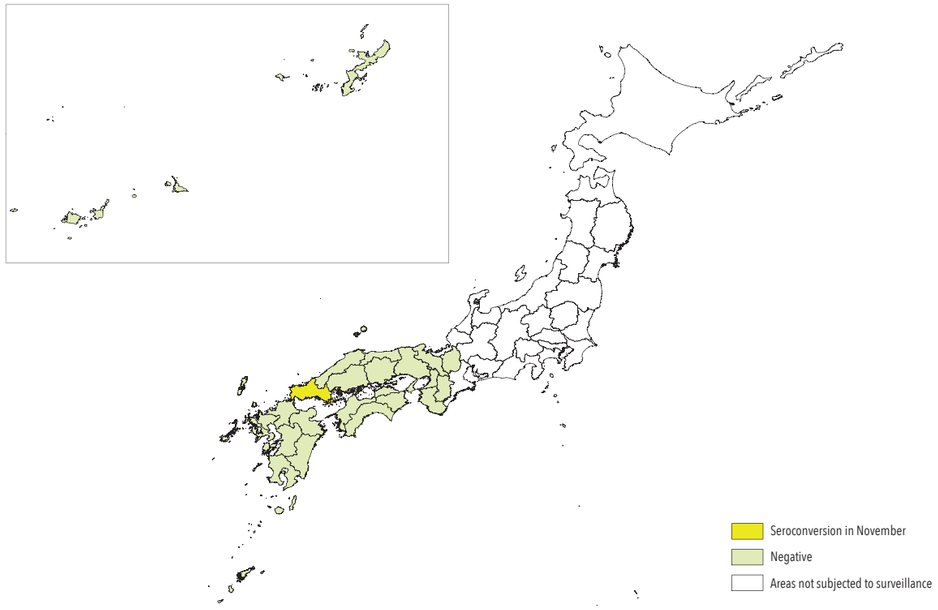
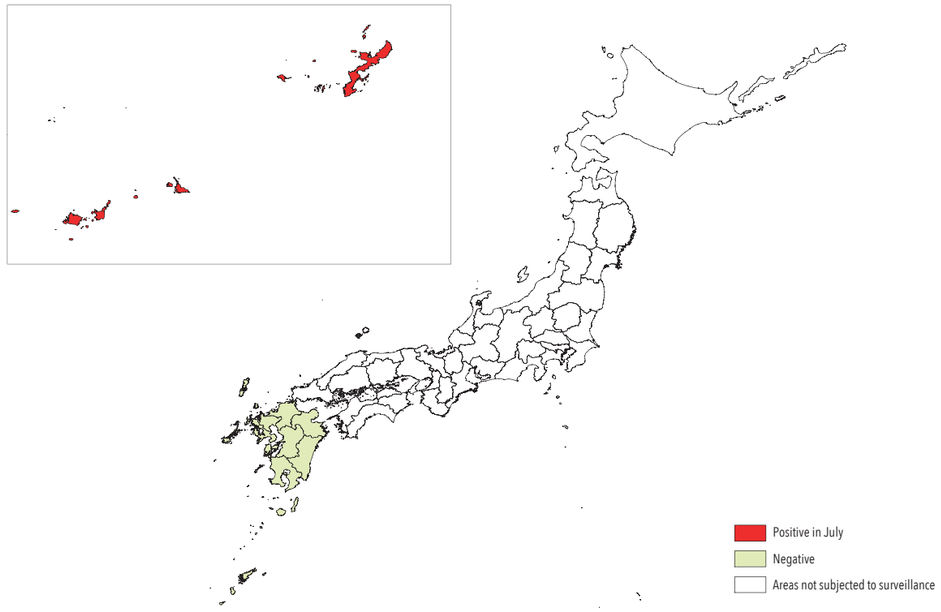


Fig.2-9-4 Results of virus antigen surveillance in FY2022 (Simbu serogroup virus and bluetongue virus)



COLUMN

Launch of Livestock Disease Surveillance Reporting System

In Japan, the results of livestock infectious disease surveillance conducted by prefectural governments have been sent to the Animal Health Division of the Food Safety and Consumer Affairs Bureau of MAFF by e-mail, etc. The Animal Health Division has been compiling these files and aggregating data. This method, however, is complicated and time-consuming at both the prefectural and national levels, making it impossible to utilize the surveillance data fully.

Given this situation, MAFF started to develop an internet-based reporting system, "Livestock Disease Surveillance Reporting System", in FY 2018 to standardize reporting contents, improve the efficiency of reporting work, and automate tabulation. The system has been partially put into operation since fiscal 2022.

This system is an internet cloud system, and data entered from prefectural information terminals is shared with MAFF in realtime. The system can be linked to other databases, for example, the disease control map system, and can call up information such as the location of a farm based on the farm's facility ID.

In addition, various error-checking functions work when accepting data so that everyone can input data in the same format, and viewing and tallying can be done smoothly. Data can be checked as a list or tabulated by reason of inspection, inspection method, etc., and output as a file.

As this system goes into full-scale operation in the future, it is expected to reduce the workload of compilation and reporting of surveillance data, and to be used for more efficient and systematic tabulation and analysis.

2-10 Other surveillance

Wildlife surveillance

Wild animals have been considered one of the sources of infection for livestock. Even for the disease eradicated among livestock, the disease may be maintained among wild animals. For this reason, it is necessary to study the status of animal infectious diseases in wild animal populations. MAFF is conducting surveillance of wild animal species for infectious diseases relevant to the livestock sector.

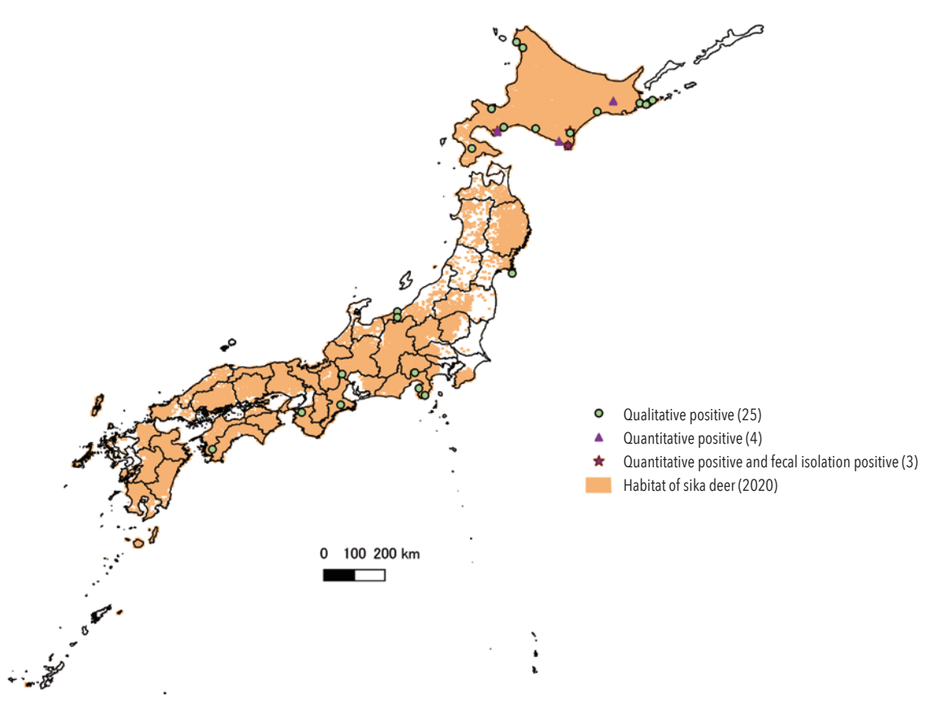
(1) Johne's disease surveillance targeting wild sika deer

From FY 2016 to FY 2022, 1,648 specimens (fecal matter) were tested for Johne's disease. 25 samples were determined as qualitative positive (i.e. *MAP* gene was detected, but low concentration). 7 samples were determined as quantitative positive (i.e. *MAP* gene was detected above the reference level) and out of them, 3 samples were confirmed positive by fecal culture (Fig.2-10-1).

(2) Chronic Wasting Disease (CWD) test for wild sika deer

Of the samples collected in FY2022, 80 samples (medulla oblongata) were tested for CWD, and all tested negative.

Fig. 2-10-1 Johne's disease surveillance in sika deer (2016-2022)

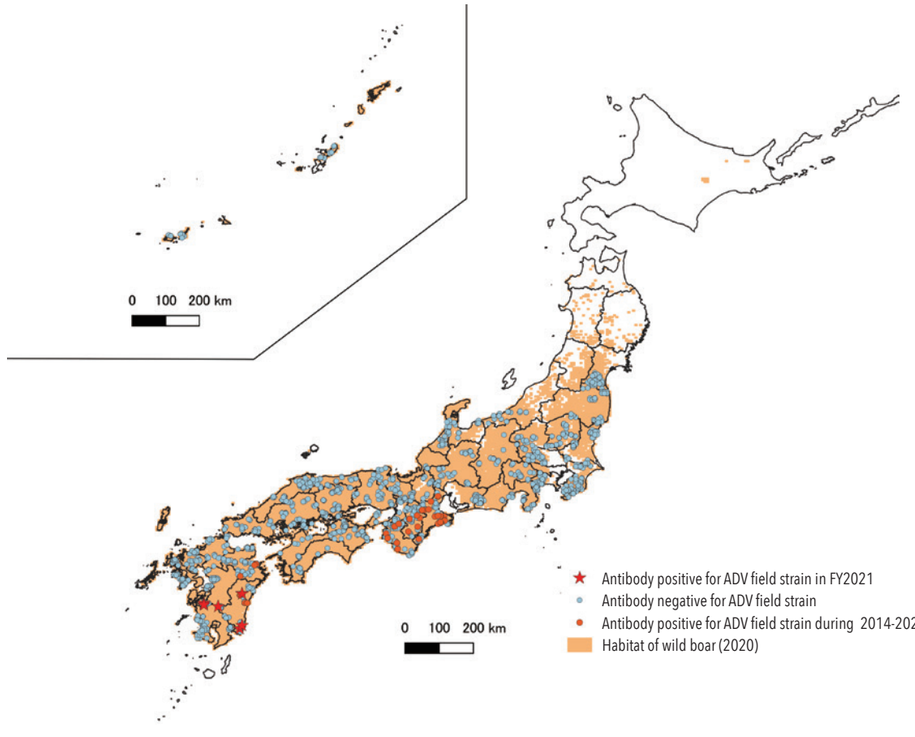


(Note: Habitat of sika deer is based on data published by the Ministry of the Environment (https://www.env.go.jp/press/109239.html)

(3) Aujeszky's disease surveillance targeting wild boars

Aujeszky's disease is a swine disease designated as a Notifiable infectious disease. Major clinical signs are abortions in pregnant sows, neurological symptoms and high mortality in young piglets. Japan has been pursuing eradication based on disease control guidelines and no outbreaks have been reported in domestic pigs since 2017. With regard to wild boars, each of 20 samples collected in 4 prefectures in the Kyusyu region were tested for Aujeszky's disease, and 7 samples collected in 2 prefectures (Miyazaki, Kumamoto), where antibodies for field strain have been detected in the past tests, were confirmed positive for antibodies in 2021 (Fig.2-10-2). Tests are ongoing as of the end of FY2022.

Fig. 2-10-2 Aujeszky's disease surveillance in wild boars (FY 2018-2021)



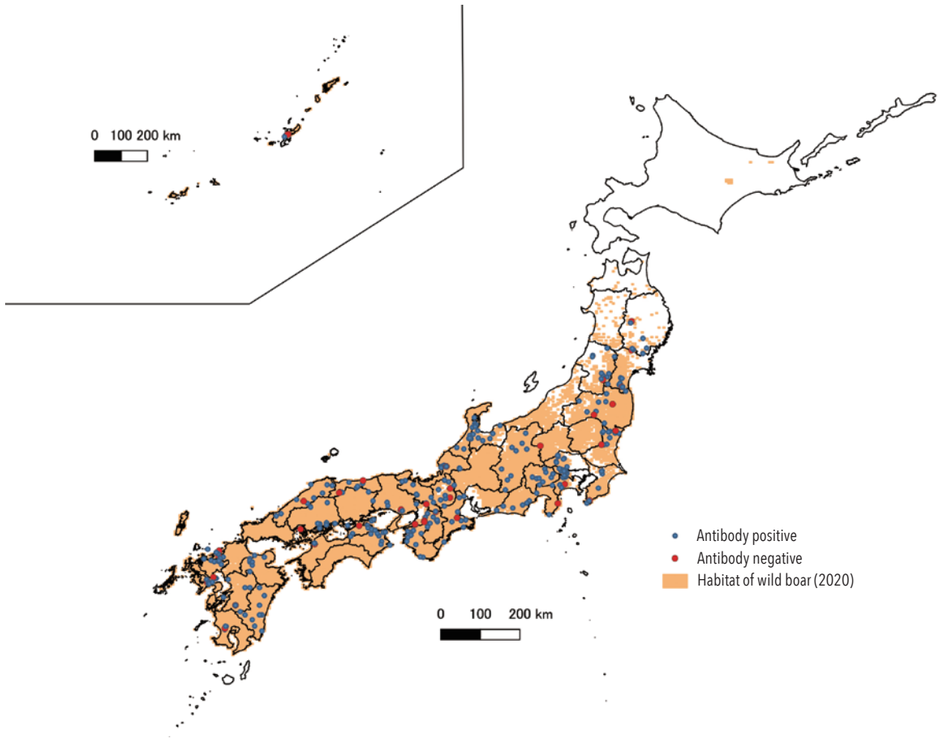
(Note: Habitat of wild boar is based on data published by the Ministry of the Environment (https://www.env.go.jp/press/109239.html). Although the map indicates wild boar habitat includes Hokkaido, according to Hokkaido, they originated from a captive boar-pig hybrid, and no wild boars in their natural state have been confirmed in Hokkaido.)

(4) Toxoplasmosis surveillance in wild boars

Toxoplasmosis is a zoonosis caused by infection with *toxoplasma*, a protozoan parasite, which mainly causes fever, diarrhea, and breathing difficulties. In Japan, it is designated as a Notifiable infectious disease of pigs, boars, sheep, and goats, and outbreaks have occurred in domestic pigs only in some prefectures. For wild boars, testing has been conducted since FY2014, and in FY2022, 358 samples collected in 36 prefectures were tested for antibodies against *Toxoplasma*. 42 samples tested positive, and at least one animal was confirmed to be antibody-positive in 27 prefectures.

More information on wildlife surveillance can be found at;
https://www.maff.go.jp/j/syouan/douei/katiku_yobo/wildlife_surveillance.html

Fig.2-10-3 Toxoplasmosis surveillance in wild boars



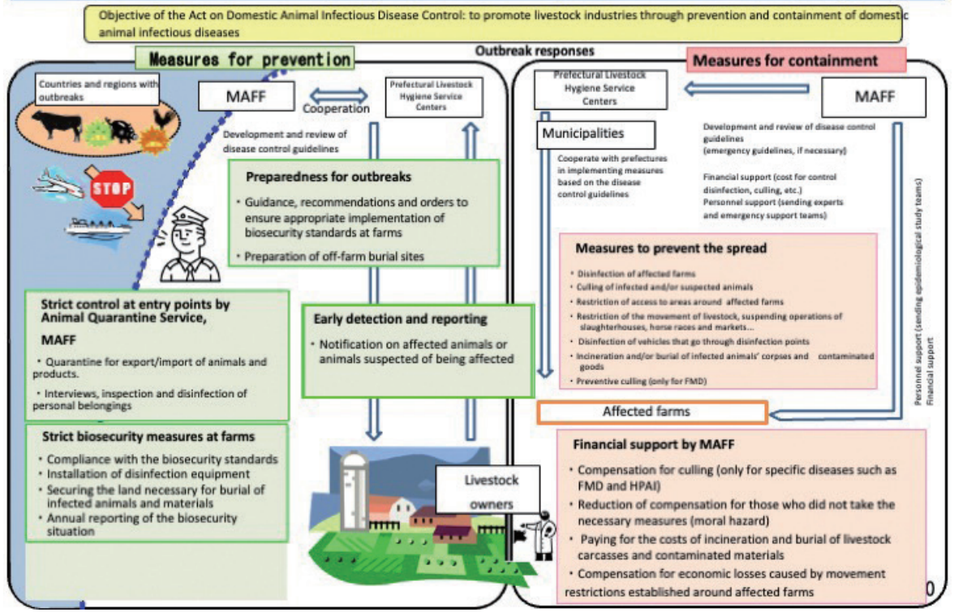
(Note: Habitat of wild boar is based on data published by the Ministry of the Environment (https://www. env.go.jp/press/109239.html). Although the map indicates wild boar habitat includes Hokkaido, according to Hokkaido, they originated from a captive boar-pig hybrid, and no wild boars in their natural state have been confirmed in Hokkaido.)

Appendixes

1 Relevant laws

Act on Domestic Animal Infectious Disease Control (Act No. 166 of 1951)	To promote livestock industries through prevention and containment of domestic animal infectious diseases.
Rabies Prevention Act (Act No. 247 of 1950)	To prevent the outbreak of rabies, to control its spread, and to eradicate rabies so as to improve public health and contribute to public welfare.
Act on the Prevention of Infectious Diseases and Medical Care for Patients with Infectious Diseases (Act No. 114 of 1998)	To provide for necessary measures concerning the prevention of infectious diseases and medical care for patients with infectious diseases in order to prevent outbreaks and the spreading of infectious diseases, and thereby to improve and promote public health.
Livestock Hygiene Service Centers Act (Act No. 12 of 1950)	To promote the livestock industry by improving the hygiene of livestock in the countryside through the prevention of domestic animal infectious diseases and by carrying out the tests and inspections necessary for the health and hygiene of livestock.
Act on Special Measures concerning Measures against Bovine Spongiform Encephalopathy (Act No. 70 of 2002)	To prevent the occurrence and spread of Bovine Spongiform Encephalopathy, thereby facilitating the protection of people's health as well as the sound development of beef cattle production and dairy farming, and beef-related manufacturing, processing, distribution, sales and food service businesses.

Outline of the Act on Domestic Animal Infectious Disease Control



2 List of the Notifiable Infectisous Disease

Disease	Animal species*	
	Art.2 of the Act	Art.1 of the Government Ordinance
Rinderpest	Cattle, sheep, goat, pig	Water buffalo, deer, wild boar
Contagious bovine pleuropneumonia	Cattle	Water buffalo, deer
Foot and mouth disease	Cattle, sheep, goat, pig	Water buffalo, deer, wild boar
Infectious encephalitis	Cattle, horse, sheep, goat, pig	Water buffalo, deer, wild boar
Rabies	Cattle, horse, sheep, goat, pig	Water buffalo, deer, wild boar
Vesicular stomatitis	Cattle, horse, pig	Water buffalo, deer, wild boar
Rift valley fever	Cattle, sheep, goat	Water buffalo, deer
Anthrax	Cattle, horse, sheep, goat, pig	Water buffalo, deer, wild boar
Hemorrhagic septicemia	Cattle, sheep, goat, pig	Water buffalo, deer, wild boar
Brucellosis	Cattle, sheep, goat, pig	Water buffalo, deer, wild boar
Tuberculosis	Cattle, goat	Water buffalo, deer
Johne's disease	Cattle, sheep, goat	Water buffalo, deer
Piroplasmosis* (limited to that caused by pathogens prescribed by the Ministrial Ordinance)	Cattle, horse	Water buffalo, deer
Anaplasmosis* (limited to that caused by pathogens prescribed by the Ministrial Ordinance)	Cattle	Water buffalo, deer
Transmissible spongiform encephalopathy	Cattle, sheep, goat	Water buffalo, deer
Glanders	Horse	
Equine infectious anemia	Horse	
African horse sickness	Horse	
Peste des petits ruminants	Sheep, goat	Deer
Classical swine fever	Pig	Wild boar
African swine fever	Pig	Wild boar
Swine vesicular disease	Pig	Wild boar
Fowl cholera	Chicken, duck, quail	Turkey
Highly pathogenic avian influenza	Chicken, duck, quail	Pheasant, ostrich, guinea fowl, turkey
Low pathogenic avian influenza	Chicken, duck, quail	Pheasant, ostrich, guinea fowl, turkey
Newcastle disease (limited to that designated as highly pathogenic by the Ordinance)	Chicken, duck, quail	Turkey
Avian Salmonelosis* (limited to that caused by pathogens prescribed by the Ministrial Ordinance)	Chicken, duck, quail	Turkey
Foulbrood	Honey bee	

*The following diseases are deemed as the Infectious Diseases when they are caused by the causative agents designated by the Ministrial Ordinance.

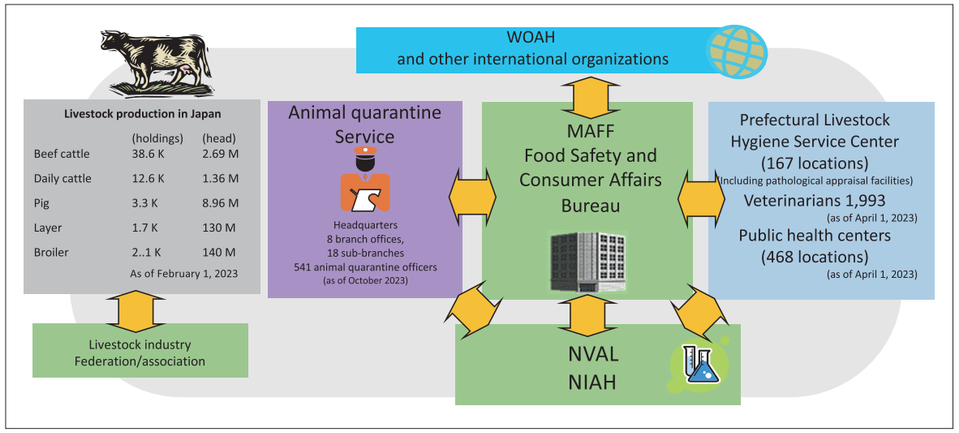
Ministrial Ordinance.	
Piroplasmosis	The disease caused by *Babesia bigemina, B. bovis, B. equi, B. caballi, Theilaria parva* and *T. annulata*
Anaplasmosis	The disease caused by Anaplasma marginale.
Avian Salmonelosis	The disease caused by *Salmonella enterica serovar Gallinarum biovar Pullorum or Gallinarum*

3 List of Notifiable Infectious Disease

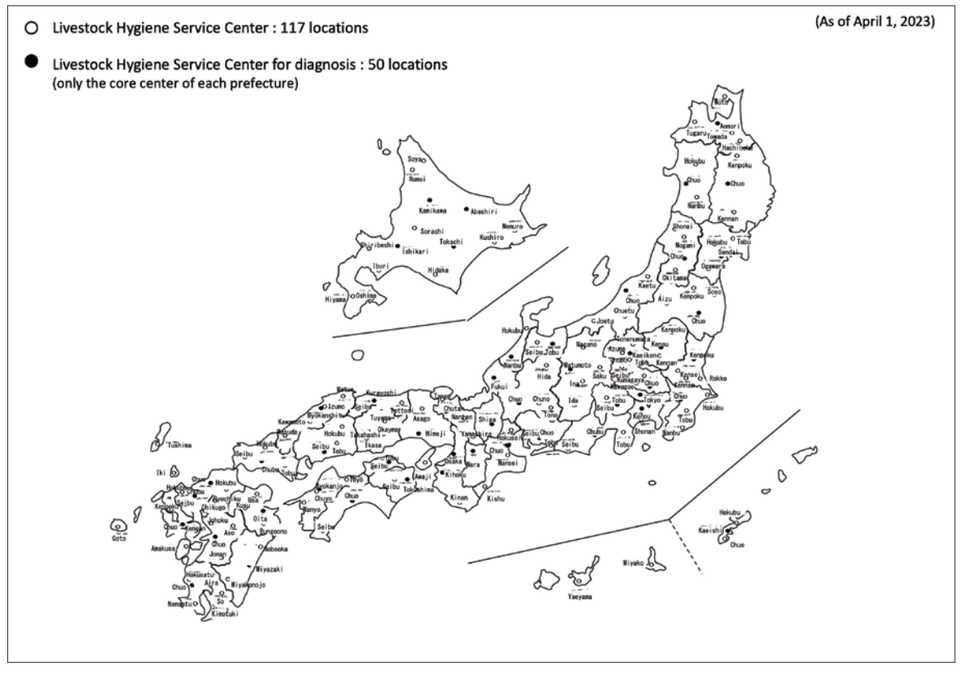
Disease	Animal species*
Bluetongue	Cattle, water buffalo, sheep, goat, deer
Akabane disease	Cattle, water buffalo, sheep, goat
Malignant catarrhal fever	Cattle, water buffalo, deer, sheep
Chuzan disease	Cattle, water buffalo, goat
Lumpy skin disease	Cattle, water buffalo
Bovine viral diarrhea	Cattle, water buffalo
Infectious bovine rhinotracheitis	Cattle, water buffalo
Bovine leukosis	Cattle, water buffalo
Aino virus infection	Cattle, water buffalo
Ibaraki disease	Cattle, water buffalo
Bovine papular stomatitis	Cattle, water buffalo
Bovine ephemeral fever	Cattle, water buffalo
Melioidosis	Cattle, water buffalo, deer, horse, sheep, goat, pig, wild boar
Tetanus	Cattle, water buffalo, deer, horse
Blackleg	Cattle, water buffalo, deer, sheep, goat, pig, wild boar
Leptospirosis	Cattle, water buffalo, deer, pig, wild boar, dog
Salmonellosis	Cattle, water buffalo, deer, pig, wild boar, chicken, duck, turkey, quail
Bovine campylobacteriosis	Cattle, water buffalo
Trypanosomiasis	Cattle, water buffalo, horse
Tricomoniasis	Cattle, water buffalo
Neosporosis	Cattle, water buffalo
Cattle grub	Cattle, water buffalo
Nipah virus infection	Horse, pig, wild boar
Equine influenza	Horse
Equine viral arteritis	Horse
Equine rhinopneumonitis	Horse
Equine morbilli virus pneumonia	Horse
Horse pox	Horse
Tularemia	Horse, sheep, pig, wild boar, rabbit
Contagious equine metritis	Horse
Equine paratyphoid	Horse
Epizootic lymphangitis	Horse
Contagious ecthyma	Sheep, goat, deer
Nairobi sheep disease	Sheep, goat
Sheep pox	Sheep
Maedi visna	Sheep
Contagious agalactia	Sheep, goat
Enzootic abortion of ewes	Sheep
Toxoplasmosis	Sheep, goat, pig, wild boar
Mange	Sheep
Goat pox	Goat
Caprine arthritis/encephalomyelitis	Goat
Contagious caprine pleuropneumonia	Goat
Aujeszky's disease	Pig, wild boar
Transmissible gastroenteritis	Pig, wild boar
Swine enteroviral encephalomyelitis	Pig, wild boar
Porcine reproductive and respiratory syndrome	Pig, wild boar
Swine vesicular exanthema	Pig, wild boar
Porcine epidemic diarrhea	Pig, wild boar
Atrophic rhinitis	Pig, wild boar
Swine erysipelas	Pig, wild boar
Swine dysentery	Pig, wild boar
Avian influenza	Chicken, duck, turkey, quail
Low pathogenic Newcastle disease	Chicken, duck, turkey, quail
Avian pox	Chicken, quail
Marek's disease	Chicken, quail
Infectious bronchitis	Chicken
Infectious laryngotracheitis	Chicken
Infectious bursal disease	Chicken
Avian leukosis	Chicken
Avian tuberculosis	Chicken, duck, turkey, quail
Avian mycoplasmosis	Chicken, turkey
Leucocytozoonosis	Chicken
Duck hepatitis	Duck
Duck viral enteritis	Duck
Rabbit haemorrhagic disease	Rabbit
Myxomatosis	Rabbit
Varroosis	Honey bee
Chalkbrood	Honey bee
Acariosis	Honey bee
Nosemosis	Honey bee

*Animal species are the ones designated in the Article 2 of the Ministrial Ordinance for Enforcement of the Act on Domestic Animal Infectious Diseases Control

3 Animal health systems in Japan

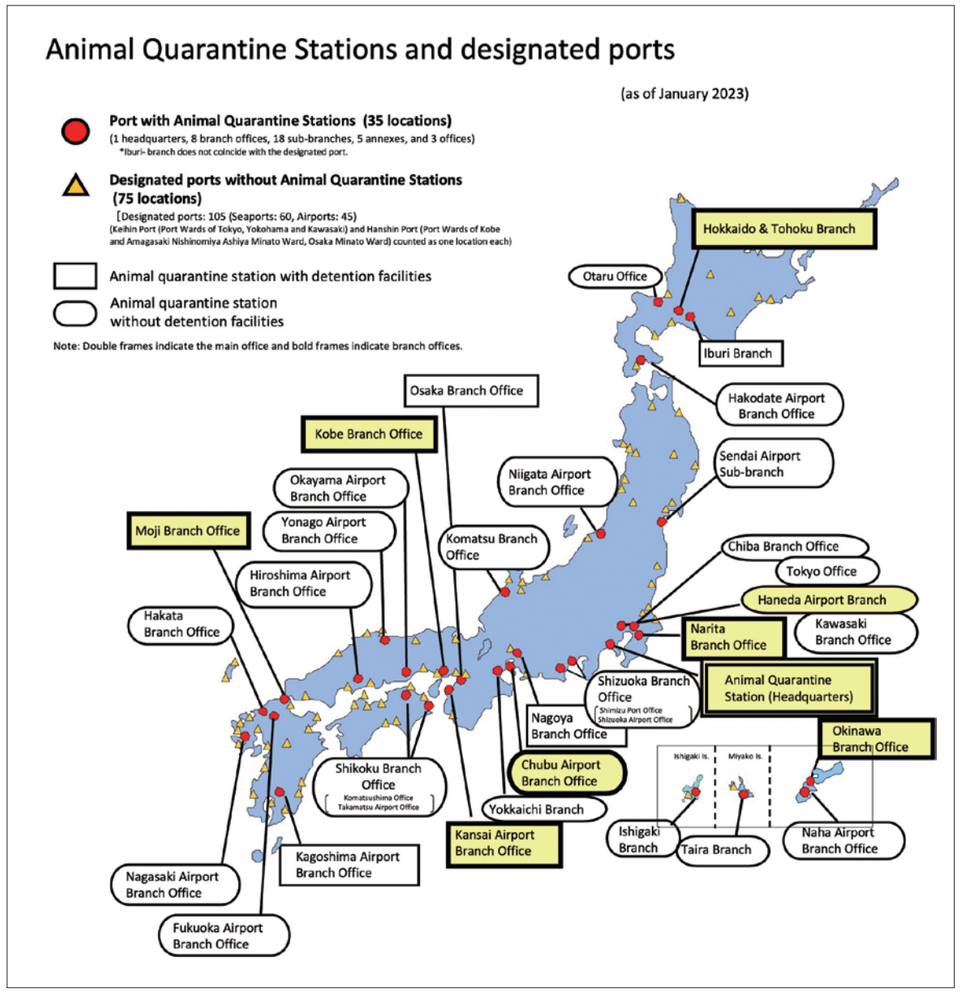


Location of livestock hygiene service centers (LHSCs) in Japan



Animal Quarantine Stations and designated ports

Animal Quarantine Stations (8 branches and 18 sub-branches nationwide, in addition to the main office in Yokohama) inspect imported and exported animals and livestock products and implement quarantine measures. At designated ports and airports.



National Veterinary Assay Laboratory

The National Veterinary Assay Laboratory (NVAL) is responsible for assuring the quality, efficacy, and safety of veterinary medical products, quasi-drugs, medical devices, and Regenerative, Cellular therapy, and Gene therapy products. NVAL perform technical examination tests and investigations, and provide guidance and advice at all stages, from development to sale and use.

National Institute of Animal Health of National Agriculture and Food Research Organization

The National Institute of Animal Health (NIAH) covers a wide range of research from basics to development on the prevention, diagnosis, and treatment of animal diseases. As the only dedicated research institute for animal diseases in Japan, NIAH also conducts confirmatory tests for infectious diseases of domestic animals and produces and distributes diagnostic reagents and other biological products for veterinary use.

Reference websites

Information on animal health; Food Safety and Consumer Affairs Bureau, MAFF
https://www.maff.go.jp/j/syouan/douei/katiku_yobo/index.html

Animal Quarantine Service, MAFF
https://www.maff.go.jp/aqs/index.html

National Veterinary Assay Laboratory, MAFF
https://www.maff.go.jp/nval/

National Institute of Animal Health of National Agriculture and Food Research Organization
https://www.naro.go.jp/laboratory/niah/

Photo courtesy of Aichi Prefecture

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Cover photo
Shooting location: Farms Chiyoda
Photo by: Chizuru Takada

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