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 boars 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. 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(Chart 2-1-1).

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 with the aim of maintaining 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 targeted for the previous year's surveillance 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 FY2023, 247 imported cattle, 537 bulls subject to seedstock inspection, and 218 cows that experienced abortion or stillbirth were tested, and all results were negative (Chart 2-1-2).

Chart 2-1-1 Number of brucellosis cases

	2021	2022	2023
(farms)	0	0	0
(animals)	0	0	0

Chart 2-1-2 Brucellosis surveillance of cattle in FY2023

Target cattle	# of cattle tested	# of negative	# of positive
Imported cattle	247	247	0
Bulls subject to seedstock inspection	537	537	0
Cows experienced abortion or stillbirth*	218	218	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)*. It 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 (Chart 2-2-1).

Objectives and methods of surveillance

Since cattle herds in Japan have already been qualified as free from the disease, surveillance is now being conducted with the aim of maintaining free status. The surveillance targets imported cattle and bulls subject to seed stock 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 targeted for the previous year's surveillance were excluded.

Surveillance results

In FY2023, 217 imported cattle and 537 bulls subjected to seedstock inspection were tested, and all results were negative (Chart 2-2-2).

Chart 2-2-1 Number of tuberculosis cases

	2021	2022	2023
(farms)	0	0	0
(animals)	0	0	0

Chart 2-2-2 Tuberculosis surveillance of cattle in FY2023

Target cattle	# of cattle tested	# of negative*	# of positive
Imported cattle	217	217	0
Bulls subject to seedstock inspection	537	537	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. MAP is 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 its spread are made following the Guideline on measures against bovine Johne's disease (see → Special Feature 2).

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 are kept for a long period. For the farms where infection has been confirmed, follow-up tests are conducted to assess disease stauts, and the farm pre-transfer inspection is undertaken 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.

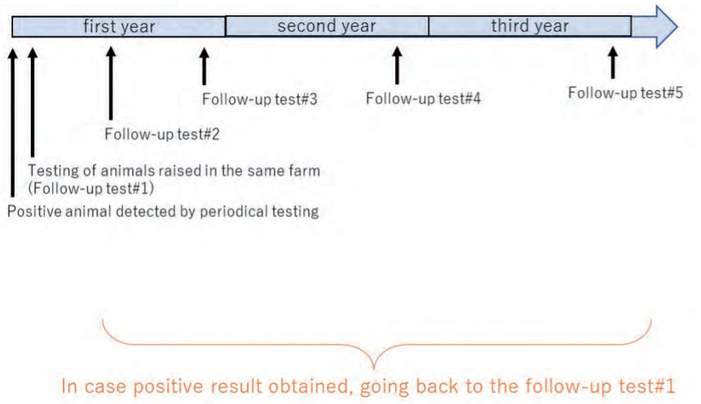
(2) Follow-up tests on infected farms

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. (Chart 2-3-1)

(3) Pre-transfer inspection on infected farms

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

Chart 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 tests using serum, skin tests, real-time PCR of fecal samples, and fecal culture. In FY2023, a cumulative total of 687,565 animals were tested for Johne's disease (Chart 2-3-4).

Chart 2-3-2 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

Chart2-3-3 Number of Johne's disease cases

	2019	2020	2021	2022	2023
(farms)	380	399	446	519	471
(animals)	1,066	809	957	1,147	1,060

Chart2-3-4 Johne's disease surveillance for cattle conducted in FY2023

Test type	Total number of animals tested*
ELISA (serum)	553,599
Johnin reaction	1,534
Fecal PCR	39,974
Fecal culture	92,458
Total	687,565

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

2-4 Bovine Spongiform Encephalopathy (BSE)

What is BSE?

Bovine Spongiform Encephalopathy (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 potentially contaminated feed from being fed to ruminants. In Japan, no new outbreaks have been reported since January 2009. In May 2013, Japan was officially recognized by WOAH as a country with "negligible risk. (Chart 2-4-1).

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 FY2023, testing was conducted on 19,194 dead cattle and, all results were negative (Chart 2-4-2).

Chart 2-4-1 Number of BSE cases by year

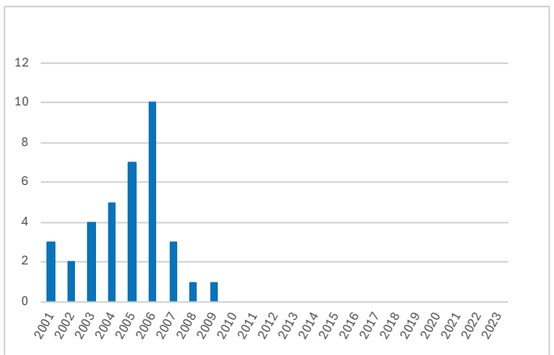


Chart 2-4-2 BSE surveillance conducted in FY2023

	# of tested
Ordinal dead cattle	12,790
Downer cattle	6,335
Cattle with specific clinical signs	69

2-5 Transmissible spongiform encephalopathy (scrapie)

What is transmissible spongiform enchphalopathy?

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 are 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 18 months of age and older, and sheep and goats with specific clinical signs such as itching sensation.

Surveillance results

In FY2023, testing was conducted on 227 sheep and 417 goats; 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 and 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 (Chart 2-6-1). Currently, reflecting the spread of disease in wild boars, vaccination of domestic pigs in the designated area, and distribution of oral vaccine to wild boars are being conducted (Chart 2-6-3).

Objectives and methods 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 are conducted on non-vaccinated farms, and antigen tests are conducted using swine samples submitted for pathological appraisal.

①Periodic on-site inspections of farms

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

②Antibody test

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

③Testing of samples submitted for pathological appraisal

When pathological appraisal was conducted by LHSC upon producer's request, samples are also tested for CSF.

(2) Surveillance results

①Periodic on-site inspections of farms

In FY2023, on-site inspections were conducted on 2,816 farms (preliminary figures), and no abnormalities were found.

②Antibody test

In FY2023, 4,135 swine from 180 non-vaccinated farms were tested, and all results were negative for CSF (Chart 2-6-2).

③Testing of samples submitted for pathological appraisal

In FY2023, tests were conducted on samples collected from 617 pigs in 205 farms (preliminary results), with 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 FY2023, 621 dead boars and 30,477 captured boars were tested, with 221 (35.6%) and 1,079 (3.5%) being PCR positive, respectively (Chart 2-6-4, Chart 2-6-5). Infected wild boars were detected in 34 prefectures until FY2022, and in FY2023, infected boars were newly confirmed in Okayama prefecture, bringing the total to 35 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/

Chart 2-6-1 Number of CSF outbreaks

	2018	2019	2020	2021	2022	2023
# of cases	6	45	10	15	9	4

Chart 2-6-2 Surveillance(antibody test) in domestic pigs in Fy2023

# of farms	# of animals tested			# of positive by antibody test	# of confirmed
	sows	feeders	others		
180	1,764	2,340	31	0	0

Chart 2-6-3 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 FY2023.

Prefectures with CSF outbreaks in domestic pigs: Red (no outbreak in Red-shaded since FY2023.)
[20 prefectures] (2,721,030 pigs (30.4% of the national total) *)
Prefectures with CSF-positive cases in wild boar: Red (except Okinawa), Orange
[35 prefectures] (4,040,090 pigs (45.1% of the national total) *)
Prefectures recommended to vaccinate domestic pigs: Red, Orange and Yellow
[46 prefectures] (8,196,400 pigs (91.5% of the national total) *)
*Data are based on the Statistical Survey on Livestock in 2023

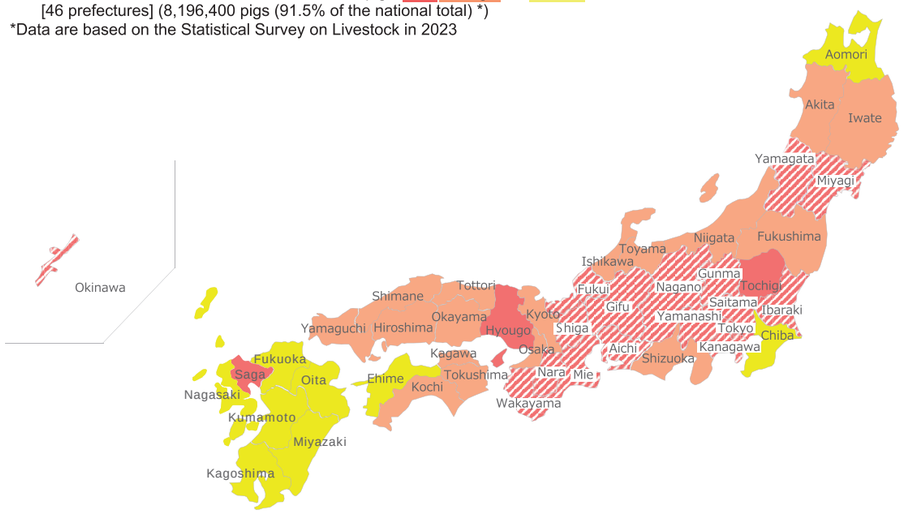


Chart 2-6-4 Surveillance on wild boars (PCR) in FY2023

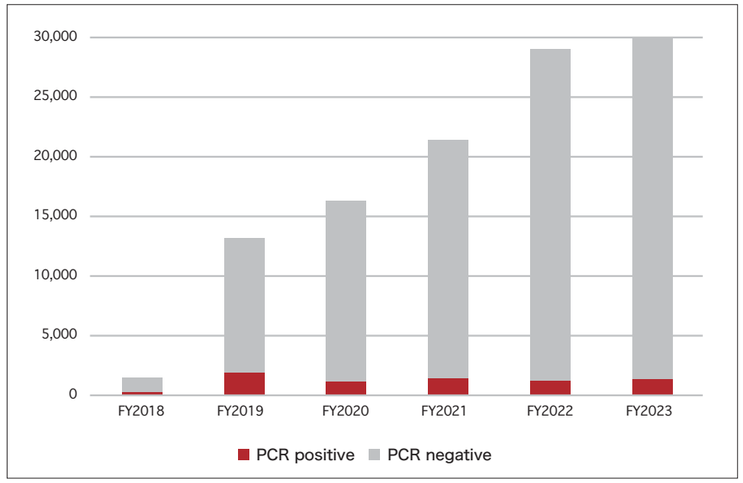
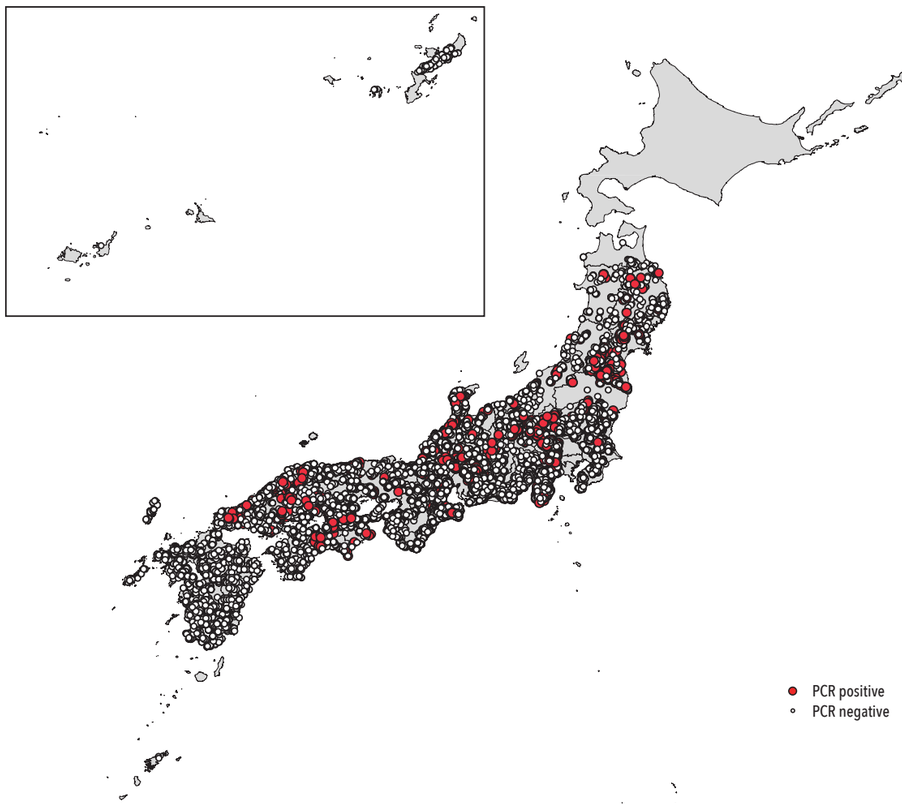


Chart 2-6-5 Distribution of wild boars tested for CSF in FY2023



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. ASF is designated as a Domestic animal infectious disease in Japan.

ASF used to be enzootic in the African region. However, the infected area expanded after the infection spread to Europe in 2007. Concerning the Asian region, the first outbreak was reported in China in August 2018, 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.

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

In addition to CSF surveillance, antigen tests are conducted using samples derived from domestic pigs and submitted for pathological appraisal.

①Periodic on-site inspections of farms

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

②Testing of samples submitted for pathological appraisal

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

(2) Surveillance results

①Periodic on-site inspections of farms

In FY2023, on-site inspections were conducted on 2,816 farms (preliminary figures), and no abnormalities were found.

②Testing of samples submitted for pathological appraisal

In FY2023, tests were conducted on 380 animals in 193 farms with (preliminary results), and all results were negative for ASF.

<Wild boar>

(1) Surveillance methods

Tests for ASF were conducted on wild boars found dead or captures using the samples collected for testing for CSF.

(2) Surveillance results

In FY2023, 620 dead boars and 26,968 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, 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 autumn to early spring (see Special Feature 1) (Chart 2-8-1). On the other hand, in the case of LPAI, although the disease 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 inspections are conducted in response to reports of unusual conditions such as increased mortality, two types of monitoring are conducted to detect infection.

(1) Fixed-point surveillance

Farms with a relatively high risk of infection, such as those 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 2023 were negative for avian influenza (Chart 2-8-2). 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/

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

	2021	2022	2023
HPAI*	29	66	38
LPAI	0	0	0

*If winter to the following spring is defined as a "season", the number of out breaks during the season is as follows.
2021-2022 season: 25 cases
2022-2023 season: 84 cases
2023-2024 season: 11 cases

Chart 2-8-2 Avian influenza surveillance in 2023

		# of farms	# of birds
Fixed point surveillance	Virus isolation	5,189	51,900
	Antibody test	5,179	52,040
Enhanced surveillance	Antibody test	1,726	17,271

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. When infected, disease and bovine ephemeral fever cause various clinical signs associated with fever. 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.

Chart 2-9-1 Number of cattle infected with arbovirus

		2021	2022	2023
Akabane disease (perinatal infection)	(farms)	0	1	3
	(animals)	0	1	4
Akabane disease (postnatal infection)	(farms)	0	0	3
	(animals)	0	0	10
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	0	0
	(animals)	5	0	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 increasing awareness, facilitating vaccination, supporting proper diagnosis for abortions, and taking other countermeasures. Surveillance is conduct- ed 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 to assess the entry of the disease by focusing on seroconversion. The target diseases are Akabane disease, Aino virus infection, and Chuzan disease. Based on past disease invasions, surveillance is conducted throughout Japan for Akabane disease. For Aino virus infection and Chuzan, surveillance is conducted in western Japan.

(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 (Chart 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 FY2023, sero-surveillance was conducted on 2,437 cattle from 782 farms. No positive antibody results were obtained for Akabane disease and Aino virus infection(Chart 2.9-3, Chart 2.9-5). Positive results for Chuzan disease were observed in Ehime Prefecture in August, Kochi Prefecture in September, and Saga, Nagasaki, Kumamoto, Miyazaki, and Okinawa Prefectures in November (Chart 2-9-4). As D'Aguilar virus (DAGV) was isolated from seroconverted cattle in Nagasaki and Miyazaki prefectures, these seroconversions observed in the western Japan are likely to be caused by the DAGV infection, which is closely related to Chuzan virus.

(2) Virus antigen surveillance

In FY2023, virus antigen surveillance was conducted on 137 cattle from 55 farms. Epidemic hemorrhagic disease virus (EHDV) genes were detected in Kumamoto and Miyazaki Prefectures in September, and Nagasaki, Kumamoto, and Kagoshima Prefectures in November (Chart 2-9-6). The samples collected in Nagasaki and Kumamoto Prefectures were confirmed to be of EHDV serotype 6. As for Chart serogroup virus, DAGV genes were detected in Nagasaki and Miyazaki Prefectures in November (Chart 2-9-7). For bluetongue virus, the gene was detected in Nagasaki Prefecture in November (Chart 2-9-8). The results of genetic analysis showed that the viral genes of the Simbu serogroup viruses were all negative.

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

Chart 2-9-2 Arboviruses subjected to surveillance

Virus group	Virus (Viruses for notifiable infectious diseases are 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 virus

Chart 2-9-3 Results of sero-surveillance for Akabane disease in FY2023

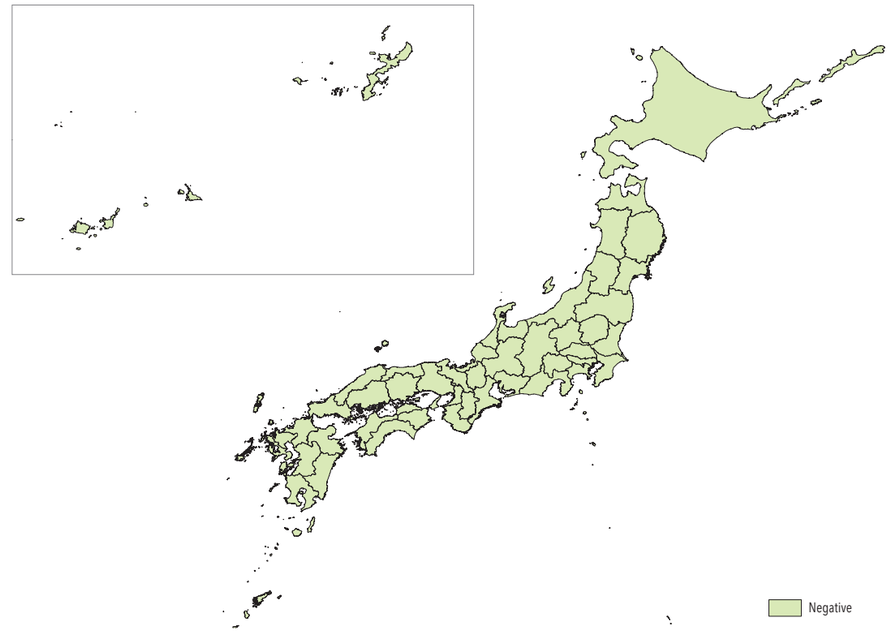


Chart 2-9-4 Results of sero-surveillance for Chuzan disease in FY2023

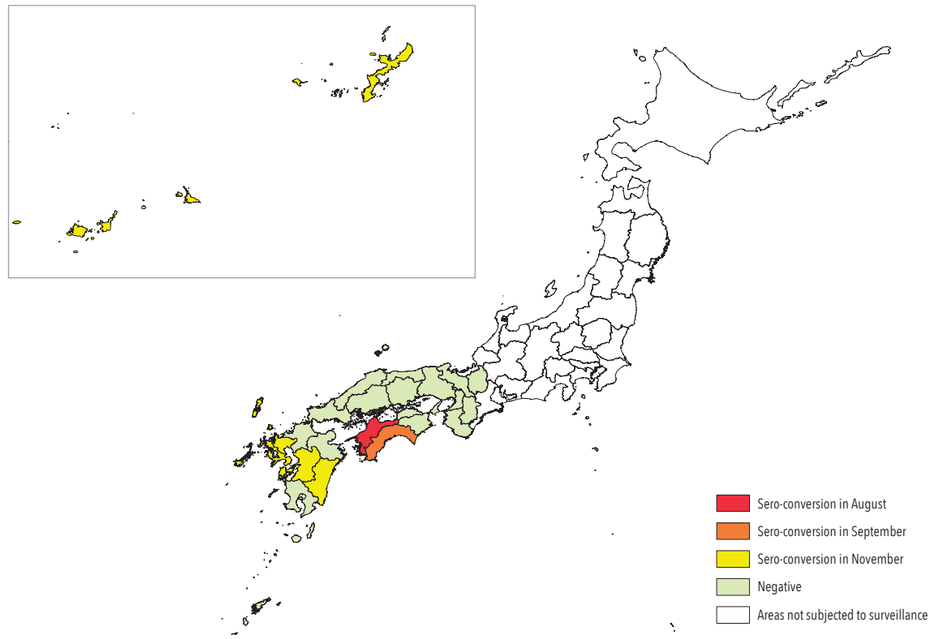


Chart 2-9-5 Results of sero-surveillance for Aino virus infection in FY2023

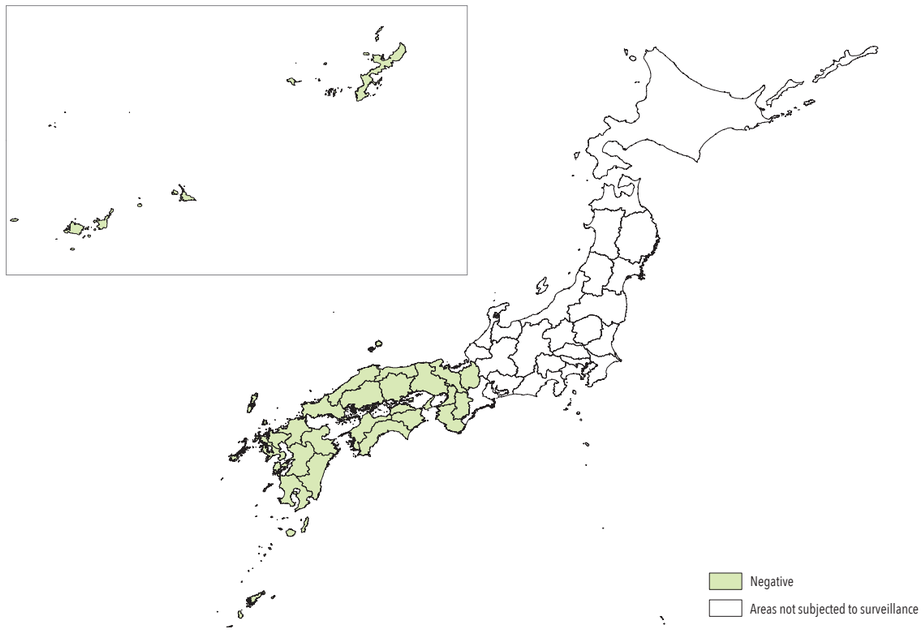


Chart 2-9-6 Results of virus antigen surveillance for EHDV in FY2023

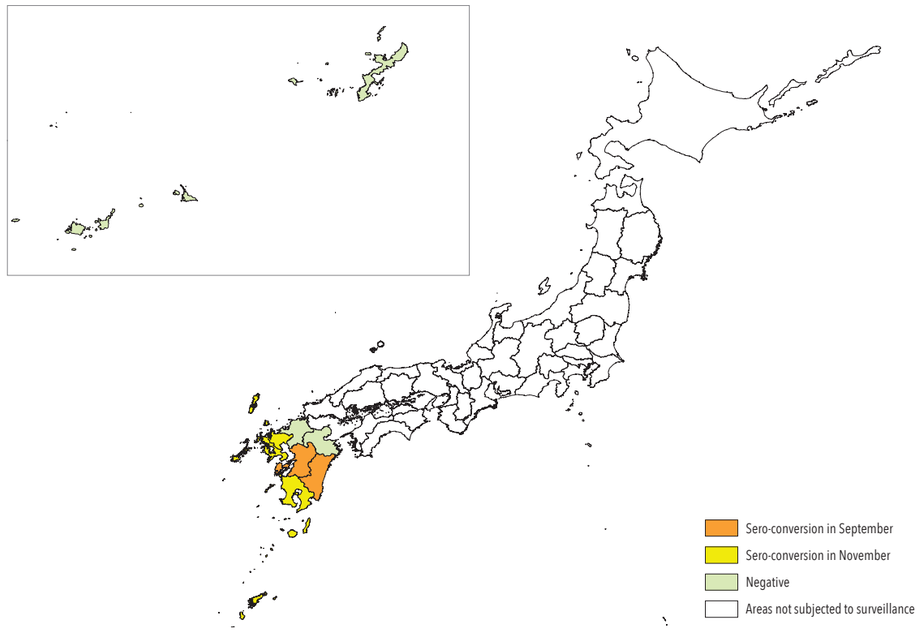


Chart 2-9-7 Results of virus antigen surveillance for DAGV in FY2023

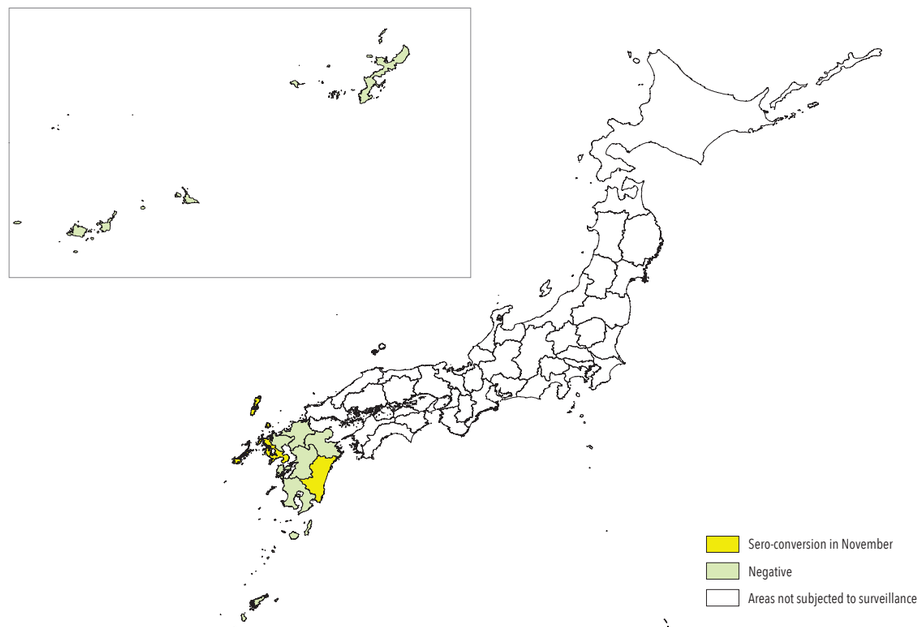
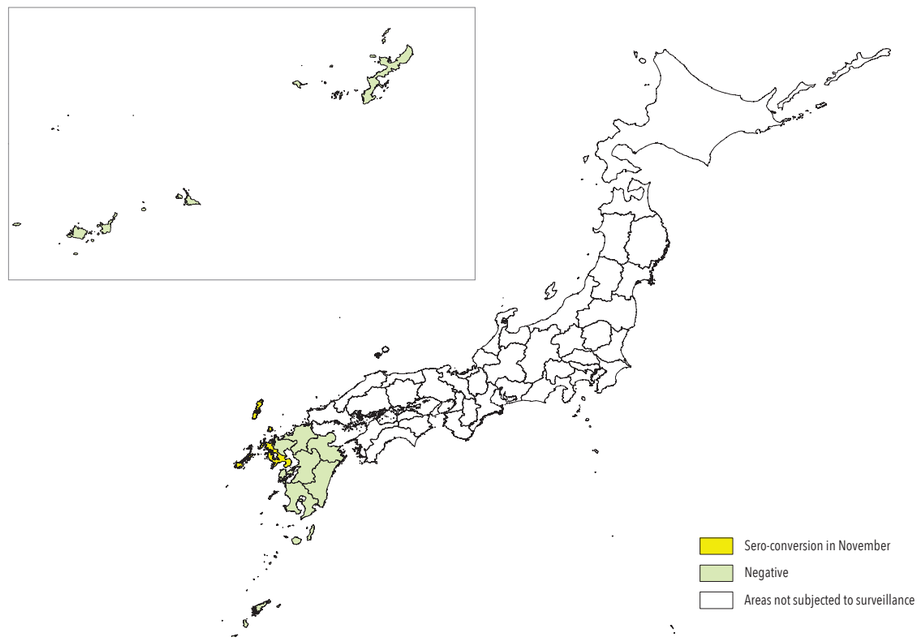


Chart 2-9-8 Results of virus antigen surveillance for BTV in FY2023



COLUMN

Animal Husbandry and Hygiene Standards in Japan

It is essential to keep livestock in a hygienic and healthy condition in order to prevent outbreaks of livestock infectious diseases. In Japan, the Act stipulates the biosecurity standards called Animal Husbandry and Hygiene Standards (hereinafter referred to as "the standards") when keeping livestock such as cattle, pigs, and poultry. Furthermore, the Act requires livestock keepers to comply with the standards and regularly report their compliance status regularly. The standards were first established in 2004 after the BSE outbreaks in Japan. Since then, the contents have been reviewed several times in light of the disease situation in Japan, such as FMD outbreaks in 2010, HPAI outbreaks, and the first outbreak of CSF in 26 years in 2018, as well as the spread of ASF in the Asian region.

There are four major categories of the standards. The first category is the basic requirements, such as establishing of hygiene control areas (areas where livestock are actually kept and must be managed in a hygienic manner). The second category is the ones to prevent introduction of pathogens onto farm, such as preparing dedicated shoes and clothes to be used in a hygiene control area and disinfection of incoming vehicles. The third category is to prevent the spread of pathogens. Even if a pathogen enters a hygiene control area, infection will not occur unless it has access to the animal housing or barns. For this reason, the standards stipulate control of rats that come into animal barns from outside and require livestock keepers to disinfect their hands and change clothes when entering the barn. The last category is to prevent the introduction of pathogens. Pathogens in a hygiene control area may spread to other farms and livestock-related facilities if appropriate measures are not taken. Therefore, the requirements related to prevention of the spread of the diseases are stipulated in this category, such as daily observation of livestock health and immediate notification of any abnormalities to the LHSCs.

MAFF has prepared an illustrated guidebook of the standards, which is available on its website (https://www.maff.go.jp/j/syouan/douei/katiku_yobo/k_shiyou/).

Shooting location: Toyama prefecture
Photo by: Ryo Ikegami

2-10 Other Surveillance

Wildlife Surveillance

Wild animals have been considered one of the sources of infection in livestock. Even if the disease is 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 2023, 1,794 samples (fecal matter) were tested for Johne's disease. 31 samples were determined to be qualitatively positive (i.e., MAP gene was detected with low concentration). 8 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 (Chart 2-10-1).

(2) Chuzan disease surveillance targeting wild sika deer

1,156 samples (sera) collected between FY 2017 and FY 2022 were tested for antibodies for Chuzan disease virus, and 6 samples from 6 prefectures (Saitama, Nara, Nagasaki, Kyoto, Kumamoto, and Ishikawa) were antibody positive. In all cases, antibody titers were low, ranging from 1:16 to 1:32.

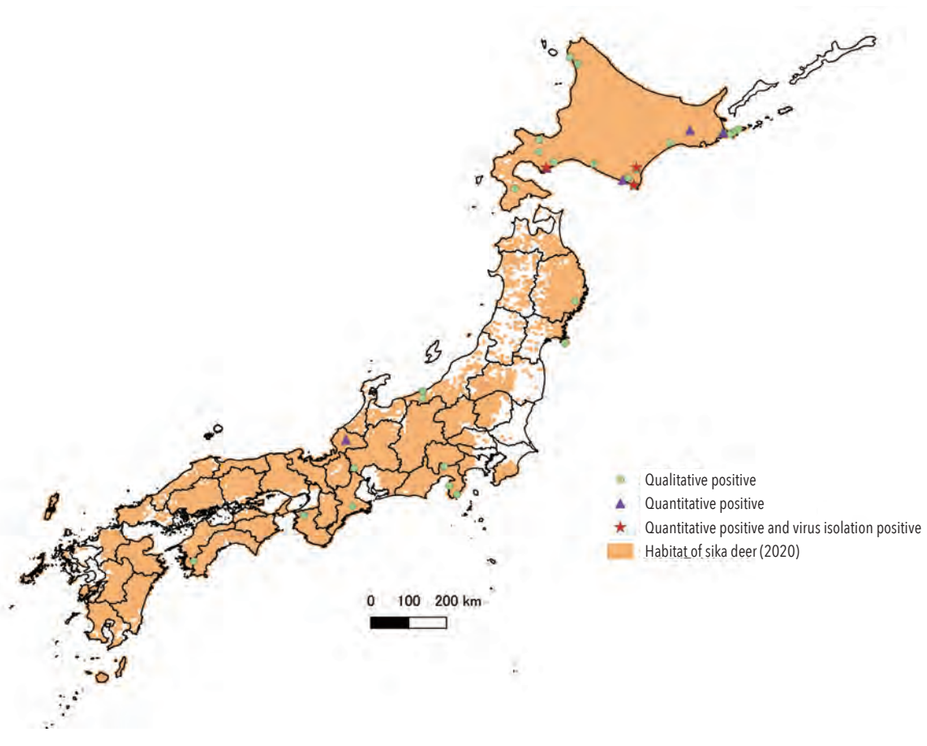
(3) Chronic Wasting Disease (CWD) test for wild sika deer

Of the samples collected in FY2023, 80 samples (medulla oblongata) were tested for CWD, and all tested negative.

(4) Aujeszky's disease surveillance targeting wild boars

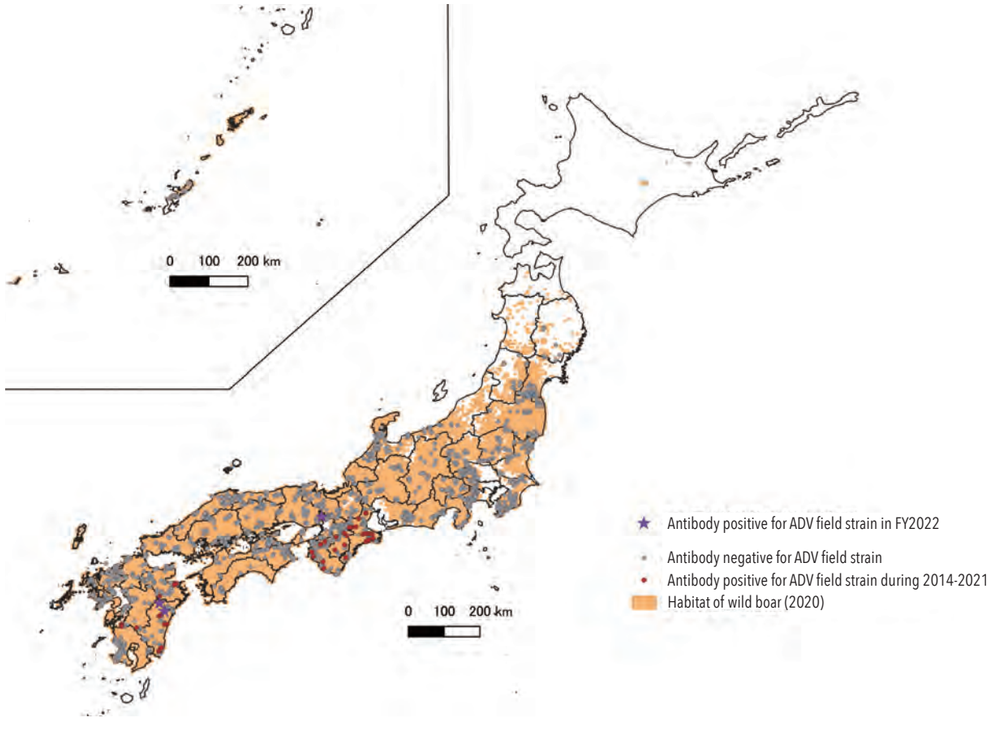
Aujeszky's disease is a swine disease that is designated as a notifiable infectious disease. Major clinical signs are abortions in pregnant sows, neurological symptoms, and high mortality in young piglets. Japan has been pursuing eradication based on disease control guidelines, and no outbreaks have been reported in domestic pigs since 2017. With regard to wild boars, a total of 358 samples collected in 36 prefectures were tested for Aujeszky's disease, and 3 samples collected in 2 prefectures (1 sample in Osaka and 2 samples in Miyazaki) were confirmed positive for antibodies in FY2022 (Chart 2-10-2). Tests are ongoing as of the end of FY2023.

Chart 2-10-1 Johne's disease surveillance in sika deer (2016-2023)



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

Chart 2-10-2 Aujeszky's disease surveillance in wild boars (FY 2018-2022)

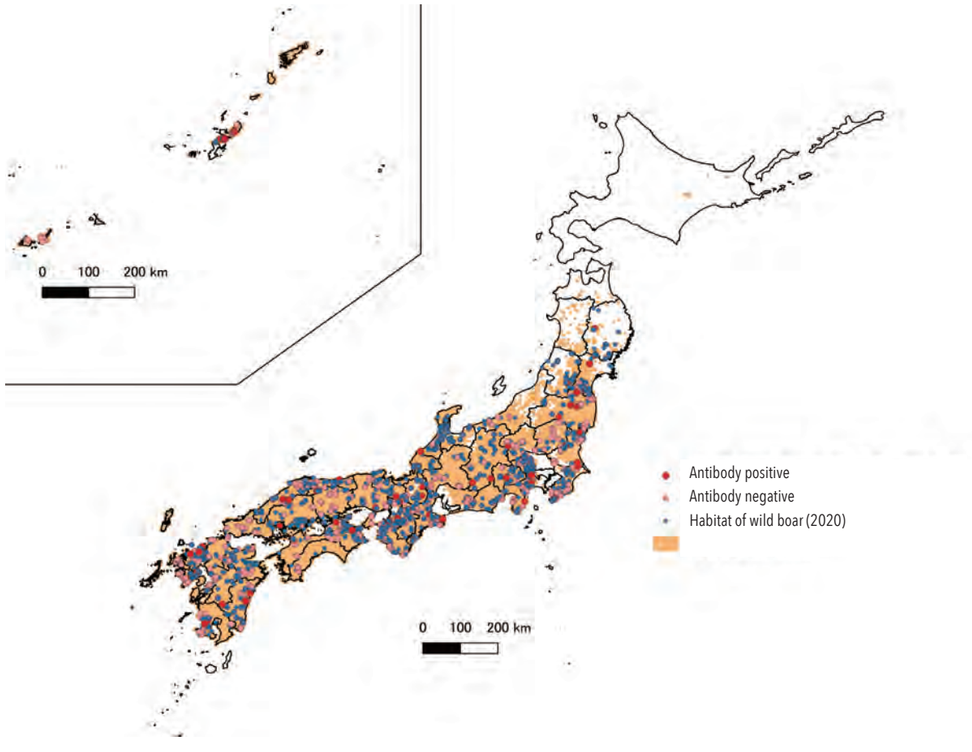


(Note: Habitat of wild boar is based on data published by the Ministry of the Environment (https://www. env.go.jp/press/109239.html). Although the map indicates wild boar habitat includes Hokkaido, according to Hokkaido, they originated from a captive boar-pig hybrid, and no wild boars in their natural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

(5) Toxoplasmosis surveillance in wild boars

Toxoplasmosis is a zoonosis caused by infection with the protozoa, *Toxoplasma gondii*, The main clinical signs of infected animals are fever, diarrhea, and dyspnea etc. In Japan, toxoplasmosis is designated as a Notifiable infectious disease in pigs, boars, sheep, and goats, and it occurs in domestic pigs only in a limited number of prefectures. Serological testing of wild boars has been conducted since FY2014, and 22 out of 320 samples from wild boars collected in 32 prefectures were positive, and at least one sample in 17 prefectures was positive in FY 2023.

Chart 2-10-3 Toxoplasmosis surveillance in wild boars

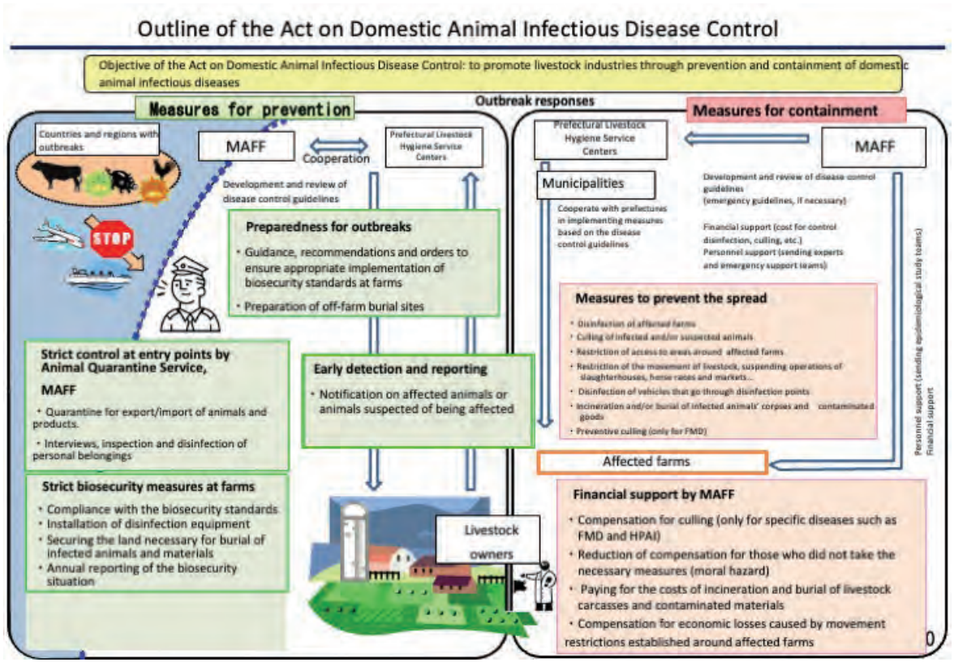


(Note: Habitat of wild boar is based on data published by the Ministry of the Environment (https://www. env.go.jp/press/109239.html). Although the map indicates wild boar habitat includes Hokkaido, according to Hokkaido, they originated from a captive boar-pig hybrid, and no wild boars in their natural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



2 List of Domestic Animal Infectious Diseases

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.

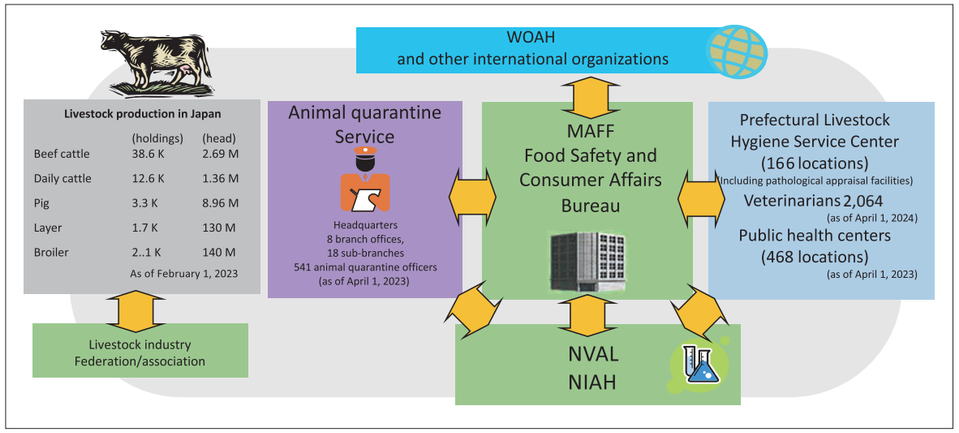
Ministrial Ordinance.	
Piroplasmosis	The disease caused by *Babesia bigemina, B. bovis, B. equi, B. caballi, Theilaria parva* and *T. annulata*
Anaplasmosis	The disease caused by Anaplasma marginale.
Avian Salmonelosis	The disease caused by *Salmonella enterica serovar Gallinarum biovar Pullorum or Gallinarum*

3 List of Notifiable Infectious Disease

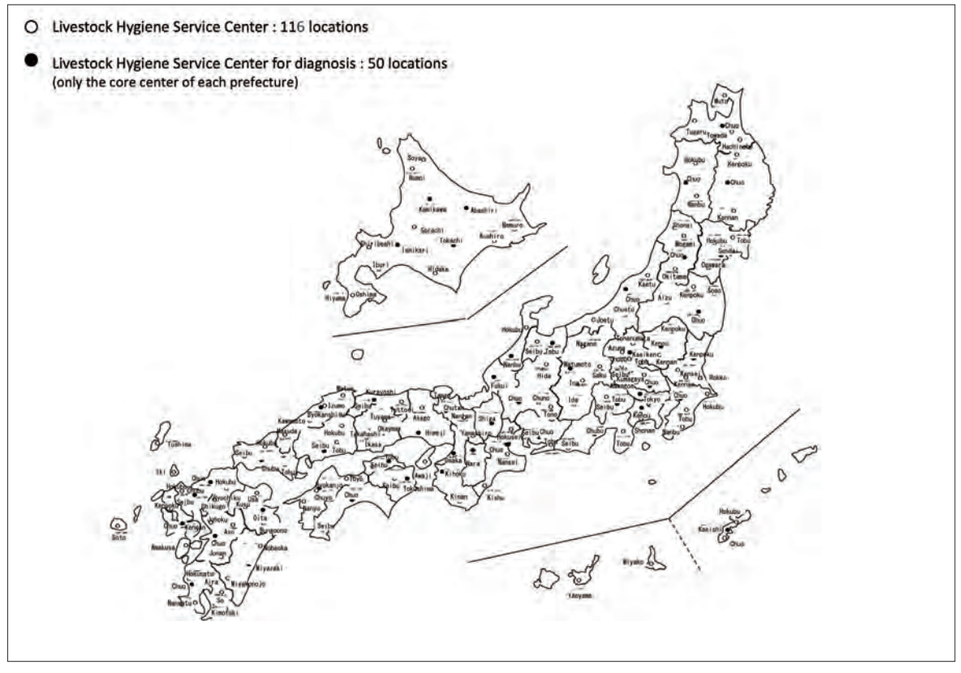
Disease	Animal species*
Bluetongue	Cattle, water buffalo, sheep, goat, deer
Akabane disease	Cattle, water buffalo, sheep, goat
Malignant catarrhal fever	Cattle, water buffalo, deer, sheep
Chuzan disease	Cattle, water buffalo, goat
Lumpy skin disease	Cattle, water buffalo
Bovine viral diarrhea	Cattle, 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

4 Animal health systems in Japan

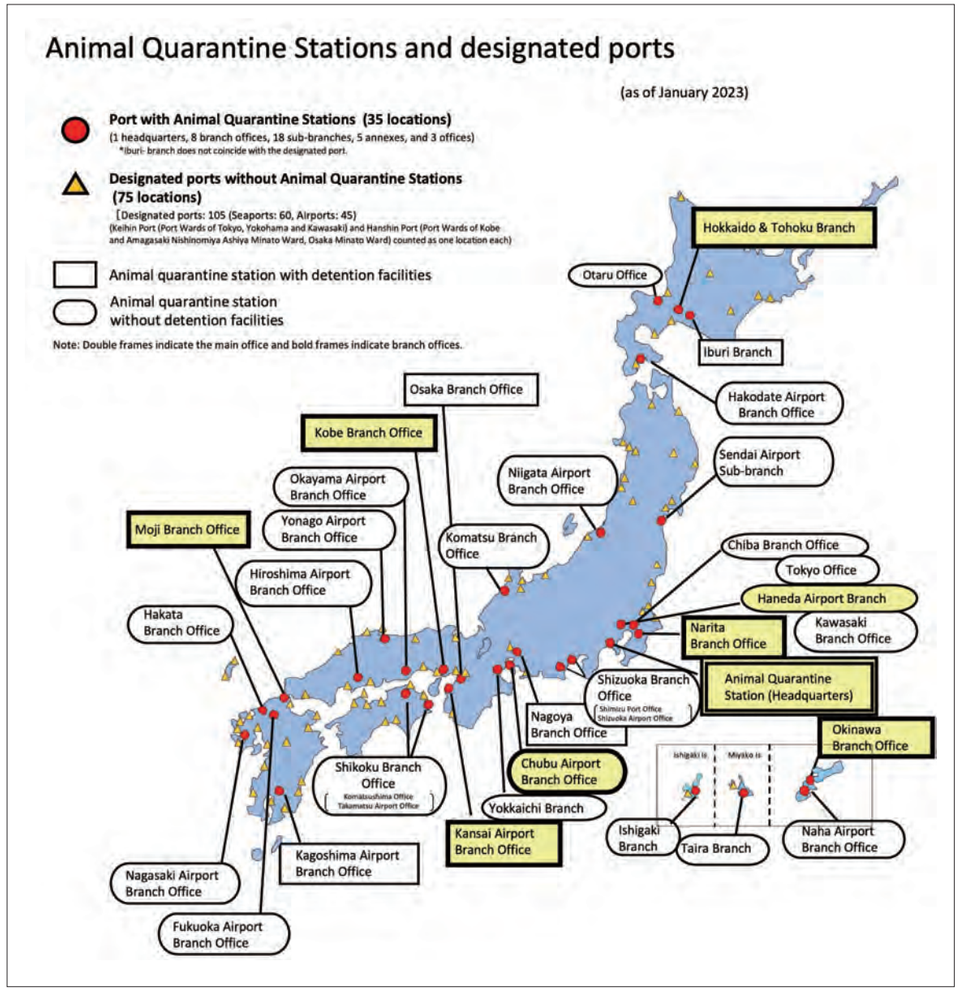


Location of livestock hygiene service centers (LHSCs) in Japan



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/e/policies/ap_health/index.html

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

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

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

Photo by Animal quarantine service

Shooting location: Kumamoto prefectural agricultural research center grassland animal husbandry research institute
Photo by: Yumi Nozaki

Cover photo
Shooting location: Kumamoto prefectural agricultural research center grassland animal husbandry research institute
Photo by: Yumi Nozaki

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