

Countermeasures against Johne's Disease

Johne's disease is a bacterial infection of cattle and other ruminants caused by infection with *Mycobacterium avium* subsp. *Paratuberculosis* (MAP). The disease causes a significant decrease in productivity due to chronic persistent diarrhea, decreased milk production, and weight loss. In cattle, an incubation period is as long as several months to several years between infection and disease onset, making early detection of infected cattle and prevention of disease spread within a farm extremely difficult. Since there is no effective vaccine or treatment, detection of infected cattle through periodic testing and culling of infected cattle is conducted to achieve disease-free.

Surveillance on Johne's disease

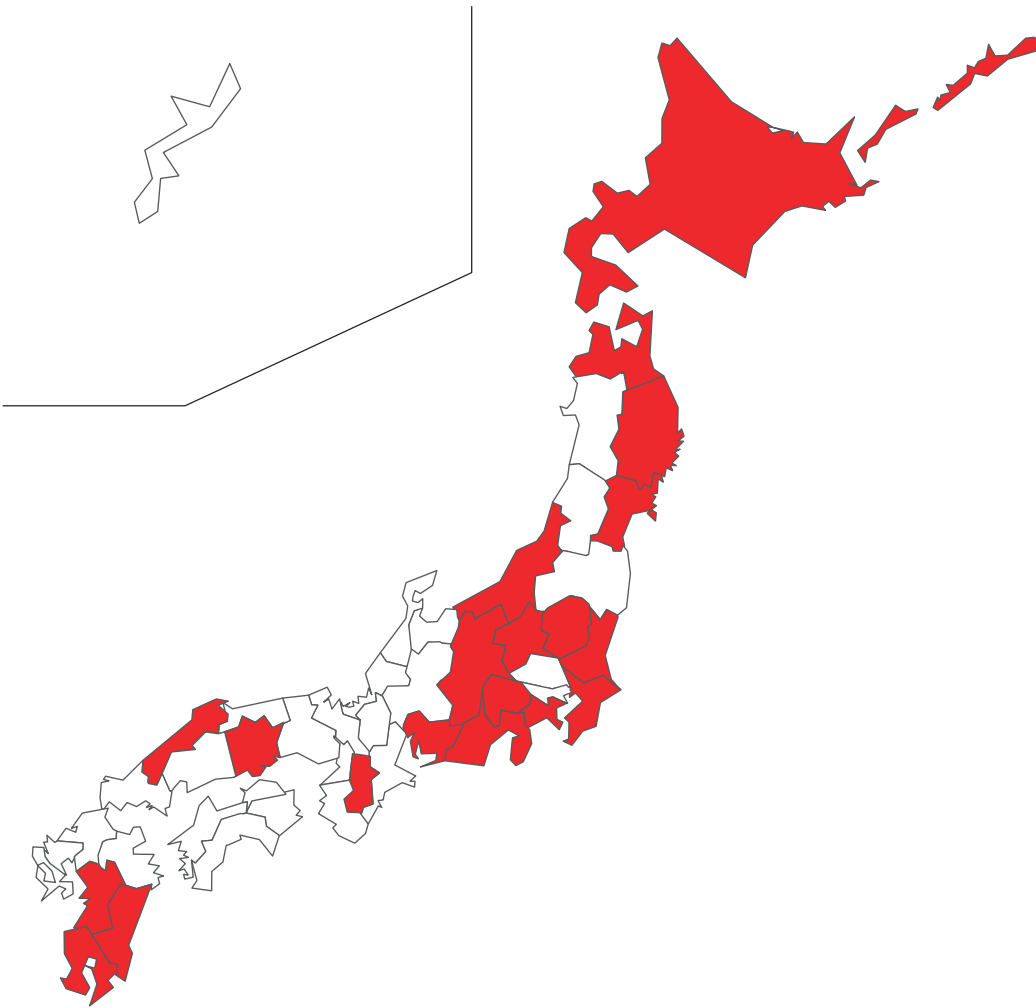
Johne's disease was designated as a Domestic animal infectious disease under the Act on Domestic Animal Infectious Disease Control (Act No. 166 of 1951, hereinafter referred to as "the Act") in 1971. At the time of designation, outbreaks of the disease occurred sporadically in imported cattle, but since the 1980s, domestic cases have increased. In 1986, the number of cases detected per year exceeded 100, and in 1997, it exceeded 500. Even after 1998, when nationwide surveillance and culling of infected cattle were initiated based on the Act, several hundred to a thousand cattle were confirmed as infected and culled every year (Chart S2-1). In 2023, 1,060 cattle in 20 prefectures were confirmed as infected cattle (ChartS2-2).

Chart S2-1 Number of cases of Johne's disease



Chart S2-2 Prefectures with confirmed Johne's disease cases in 2023

The red color indicates the prefectures in which Johne's disease was confirmed.



Control measures

Since Johne's disease is spread by MAP in the feces of infected cattle, and no treatment or vaccines are available, Japan has been carrying out the detection of the infected cattle through periodic testing, and culling of infected cattle. However, the increase in the number of infected cattle has not been halted, and in order to promote comprehensive measures for prevention, early detection, and control of the spread of the disease, the "Guidelines for Quarantine Measures against Bovine Johne's Disease" (hereinafter referred to as "the guideline") was released in 2006. In addition to the detection and culling of the infected cattle through periodic testing, the guideline recommends additional measures that include testing of cattle to be newly introduced into the farm, awareness raising, ensuring appropriate biosecurity measures, enhancing control measures on affected farms, and promoting voluntary

culling of suspected cattle.

Preventive measures

Since Johne's disease is transmitted by oral ingestion of MAP excreted in the feces of infected cattle, it is necessary not to introduce infected cattle to a farm. Therefore, in the guideline, it is recommended to introduce cattle from farms other than Johne's disease positive farms. If there is no option but to introduce cattle from Johne's disease-positive farm, testing should be conducted to ensure the cattle are free from Johne's disease. In addition, since it is known that susceptibility to Johne's disease is higher in calves, the guideline recommends farmers keep calving pens clean, separate calves from the adults, and feed colostrum obtained from Johne's- disease-free cows or use colostrum substitutes.

Measures for early detection

In Japan, periodic testing of breeding cattle is conducted under Article 5 of the Act for early detection of Johne's disease. Primarily, a screening test is conducted by antibody testing (ELISA) using blood samples or a preliminary PCR using fecal samples. When the screening test results come up positive, a diagnostic PCR test using fecal as a confirmatory test is conducted (Chart S2-3).

Ensuring farm biosecurity and disease preparedness

On farms where infected cattle are detected through surveillance or other means, in addition to culling the infected cattle and disinfecting the farm, the other cattle in the same premises are also tested. Such tests are conducted multiple times after detecting the first case at least 5 times within 3 years. The farm regains free status if a new case is not detected in any of these tests. In case a new case is detected, the testing diagram should be followed from the beginning again. Since Johne's disease has a long incubation period, repeated testing over several years is expected to detect infected cattle on affected farms efficiently.

Chart S2-3 Testing diagrams for Johne's disease

