

HerdSure® protocol for Johne's disease in cattle herds



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Introduction

This protocol describes the process used to establish the disease status for Johne's disease in cattle and for control and subsequent monitoring.

It should be emphasised that the attainment of disease-free status by an infected herd can be a lengthy process and may take a number of years.

This protocol is suitable for both dairy and beef herds.

The three main elements of this Herdsure® protocol for Johne's disease are:

- sampling and testing to determine status.
- sampling and testing to monitor the improved health status of the herd together with advice on appropriate measures to reduce the risk of re-introducing infection.
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The Johne's disease protocol comprises a testing regime to establish herd health status at three different levels:

Level 1	Establishes the Johne's disease status of the herd.
Level 2	Aims to improve the health status of the herd for Johne's disease.
Level 3	Monitors and aims to maintain the improved (or established as satisfactory at Level 1) health status of the herd for Johne's disease.

The disease

Impact of the disease

Johne's disease, or paratuberculosis, is a chronic illness causing progressive loss of condition, diarrhoea and reduced milk production. It is a bacterial infection caused by *Mycobacterium avium paratuberculosis* (MAP). This organism is present in the faeces of infected animals and it can survive for over a year in the environment. It can also be present in colostrum and milk from both clinically and sub-clinically infected animals.

Calves can be infected in the uterus and therefore born already infected. Young calves are most susceptible to infection and the bacterium is transmitted mainly from contaminated faeces via the oral route. Increasing age is associated with increasing natural immunity and adult infection is considered uncommon. The disease has a long incubation period (years) and animals usually show clinical signs at around 3 to 5 years of age. The disease causes a progressive change in the intestinal lining leading to protein loss.

Infection is most likely to enter a herd by the purchase of clinically normal but infected livestock. Uncontrolled infection in the herd can lead to increasing losses due to reduced longevity, poor quality cull cows and reduced milk production. If nothing is done to control the disease, it will inevitably spread to produce more infected animals and ever greater losses in production.

The disease also affects sheep, deer and goats but strains are considered to be species-specific so disease in these other species does not normally cause a threat to cattle.

There is also the consideration that MAP may be implicated in Crohn's disease in humans, although there is no conclusive evidence to prove this. The Food Standards Agency and Defra advise on the precautionary principle that attempts should be made to minimise the number of organisms present in milk.

Detecting and removing the organism (MAP)

As already noted, the disease has a long incubation period which may last for 5 or more years. During this time, the infected animal is likely to be clinically normal but may eventually pass the organism in the faeces at a low level. As disease develops, a higher number of organisms are passed and the likelihood of detecting the organism and an antibody response increases. By the time an animal shows clinical signs of diarrhoea, there may be millions of organisms in a gram of faeces.

Testing methods

Infected animals can be identified by testing for antibodies to Johne's disease or by confirming the presence of the organism.

Testing for the antibody is carried out by ELISA testing on blood or milk samples.

The presence of the organism can be established from faeces or tissue samples using Polymerase Chain Reaction (PCR) or by culture methods.

The Johne's disease protocol makes use of the ELISA test as the main testing method. This test is not so sensitive in detecting animals that are clinically normal and in the early stages of infection but this does mean that animals with the highest risk of spreading infection are the most likely to be identified and targeted for action.

Although it is possible to screen a herd by taking individual rectal faeces samples from all animals >2 years old and screening by culture or PCR this is not part of the standard Herdsure® protocol. If a whole herd faeces screen is being considered, this should be discussed with your veterinary practitioner.

Bovine tuberculosis is also caused by a mycobacterium. It is therefore possible that the skin test for that disease may cause an antibody response that could be detected in the ELISA test for Johne's disease. To avoid any possibility of interference with the ELISA test, it is advised that blood or milk sampling for Johne's disease should not be carried out within the 3-month period following Tuberculin Testing (TT). For some herds, for example those undergoing repeated 60-day herd testing, this will not be possible. For these herds, contact your veterinary practitioner who will advise on the best course of action.

When milk samples from cows that have calved in the last 10 days are tested, there is a chance that the high levels of antibodies present could lead to a false positive result. It is therefore recommended that cows up to 10 days post calving are not tested using the milk ELISA.

The use of vaccine may need to be considered if the infection rate, determined by Herdsure® testing, is particularly high. This will not remove infection from the herd but will, in most cases, reduce the number of clinical cases and so increase longevity and productivity. For most effect, the vaccine should be used in calves less than a month old. This is a course of action that will need to be discussed with your veterinary practitioner. Because it is not possible to differentiate between vaccinated and infected animals, vaccinated herds cannot be enrolled into the Herdsure® service for Johne's disease. Herds that are vaccinated whilst undergoing the Herdsure® programme of testing should discontinue the programme.

Keeping track of progress in Herdsure®

Each registered holding will be issued an **annual herd progress report**. The progress report will detail the level achieved for each protocol for which the herd is enrolled on the date of issue.

For a small fee an additional progress report can be produced. This progress report, like the annual report, will detail the level achieved for each protocol for which the herd is enrolled on the date of issue.

Biosecurity

Avoiding the introduction of the bacterium into a 'clean herd'

The principles for this disease are essentially the same as for BVD. The following are risks that are specific to Johne's disease.

Sourcing of replacement animals

Added animals could be infected but test negative and thereby introduce infection into the herd. This risk can be reduced by purchasing from a herd of similar or higher herd health status. If buying in animals of any age from a herd of unknown status is necessary, the animals should be tested by blood and faeces sampling on the farm of origin. If any animal is positive, animals from that source should not enter the herd.

New animals should be quarantined and tested by both blood and faeces sampling

before they enter the herd. The animals should not enter the herd unless both tests are negative. If groups of animals from different herds of origin are tested and one or more from any group tests positive, none of that group can enter the herd without loss of the herd's status.

Shows and sales

Due to the absence of a test with potential for detecting infection soon after possible exposure to MAP, no testing is required when show animals return to the herd. The risk of infection is considered highest in calves under 6 months of age and so these animals must be tested for four consecutive years once they are 2 years of age.

For CHeCS-accredited herds, the CHeCS rules must be followed:

If cattle from an accredited Johne's disease-free herd leave their home premises for fewer than 7 days and are prevented from direct contact with other animals' faeces and soiled bedding, these can rejoin the herd without the need for isolation and testing.

Colostrum

It is important that colostrum from a non-Herdsure® service herd or herd of lower status is not used on a Herdsure® service farm.

Water

Natural water sources are a risk for Johne's disease. If cattle of unknown health status, sheep or South American Camelids (SACs) have access upstream, or if the water has passed through another livestock farm, then it is preferable that cattle included in the Herdsure® service should not have access to it.

Isolation facilities and grazing

Cattle from Level 3 herds (including accredited cattle) must not enter housing, paddocks or fields that have housed Johne's positive (or non-accredited) animals in the last 12 months. A similar period must elapse before dung/manure from the housing of sero-positive (or non accredited) animals can be spread on to grazing land.

Co-grazing with sheep and other ruminants or SACs

It is recommended that sheep and other ruminants or SACs do not co-graze with Herdsure® service cattle.

Adding cattle – avoiding buying in disease

The Herdsure® service recommends that all added animals are isolated and tested before joining the herd. Testing and isolation of added animals is mandatory for herds seeking CHeCS accreditation. The only exception to this is where animals are sourced from CHeCS disease-free certificated herds. Refer to the CHeCS technical document for the rules that apply. It should be noted that non-accredited added cattle will need to be tested annually until they have achieved four clear tests.

Establishment of a new herd from accredited stock

Where it is intended to establish a Johne's-free accredited herd by acquiring cattle accredited free of Johne's, the premises must be inspected by the veterinary practitioner before the new stock is introduced in order to ascertain that the biosecurity of the premises and farm boundaries meet the requirements of CHeCS. Accreditation testing for Johne's must be carried out no sooner than three months after establishing the herd.

Once testing has been completed, with satisfactory results, the herd can be recognised as having achieved accredited status.

The protocol

Level 1

Objective of Herdsure® testing

- To establish whether Johne's disease infected animals are present in the herd.

Of particular importance to this protocol is the 'Farm Risk Questionnaire', which should be completed with your veterinary practitioner. This includes questions on possible historical cases of Johne's disease, the rearing of calves and the sourcing of replacement animals. This will allow our Herdsure® consultants to offer tailored advice to meet your particular farm needs.

Herds with laboratory-confirmed clinical disease established within the last 5 years, e.g. by culture or *post mortem* and histopathology, should progress to Level 2 without testing at Level 1.

Sampling

All animals more than 2 years old will need to be blood (red top sample) or individually milk sampled and the samples screened by antibody ELISA test. It is acceptable to submit a mixture of blood and milk samples for one herd test.

As already noted, there is also the possibility to screen a herd by taking individual rectal samples from all animals more than 2 years old and screening by culture or PCR. Individual samples may be pooled at the laboratory and examined in batches of five.

If positive milk or blood samples are disclosed in less than 2% of the cattle eligible for testing these may be tested by PCR of faeces samples to eliminate the possibility of cross-reaction. However, it should be noted that this option can only be used where these animals are homebred and there is no previous evidence of infection in the herd.

If a faeces sample is not available and the animal is slaughtered, then every effort should be made to obtain the ileo-caecal part of the intestine and the local lymph node in order to test them for the presence of MAP by culture/PCR or histopathology at your nearest AHVLA laboratory.

If any animal gives a positive result to the 'second test' then it is confirmed as infected. Animals giving negative results to the 'second test' will be considered on a case by case basis. Any subsequent animals that give a positive blood or milk test result do not need a 'second test' and will be automatically identified as infected.

If a herd has undergone a whole herd test where no reactors have been revealed, the herd can proceed towards Level 3 by having a repeat blood or milk test 12 months later at Level 2. If any animals are confirmed as sero-positive and infected and control of Johne's disease is to be attempted, the herd proceeds to Level 2.

Level 2

Objective of Herdsure® testing

- To reduce the detrimental influence of Johne's disease in the herd. Improved health status is achieved by the introduction of a management plan to reduce the occurrence of new infections together with annual testing of adult animals to identify infected animals.

Herds are at this level for the following reasons:

- laboratory-confirmed disease within the last 5 years.
- infection confirmed in a herd that entered at Level 1.
- the herd was negative at Level 1 and is proceeding towards Level 3.
- testing at Level 3 has revealed confirmed positive animals.

Where Johne's disease is present, management practices that allow young calves to access adult faeces or slurry will increase the risk of infection spreading to these calves. The 'Farm Risk Questionnaire' associated with this disease protocol, which your veterinary practitioner will complete with you, has been designed to determine whether these and other risks are present on farms so that risks can be reduced or removed should control be attempted.

Management recommendations

Following these management recommendations should help reduce the number of new infections being established in newborn/young calves.

- ensure calving accommodation is clean and dry with adequate bedding and, ideally, is disinfected between calvings.
- calves should be removed as soon as possible after birth. If colostrum is to be taken, the teat and udders should be free of faecal contamination.
- waste milk should not be fed. Ideally milk replacer or pasteurised milk should be fed to calves. Do not use pooled colostrum.
- ensure feed, milk and colostrum are not contaminated with faeces from adult cows.
- ensure youngstock do not graze manured pasture and only mix young and adult stock when over 12 months old.
- isolate any cows with possible Johne's disease and test to establish disease status.
- cull unthrifty sero-positive cows.
- try to purchase replacement animals from a low risk source.
- remove the latest offspring from confirmed cases of Johne's disease or sero-positive animals and do not keep as replacement animals.

When testing identifies infected animals, ideally they should be removed from the herd as soon as possible, along with their latest offspring. However, if many animals are identified as 'sero-positive', this may not be possible. In this case, those that pose most risk to other animals should be removed first, as part of a staged removal of sero-positives

Cows that have high antibody results should be prioritised for culling. This may be influenced by reduced milk production, declining body condition, persistent scour, infertility, lameness and mastitis as well as the availability of replacements. Calves born to cows with high antibody results should not be kept as replacements and should be culled.

Testing of the herd at 12-monthly intervals continues until no more infected animals are detected; the herd can then progress to Level 3. Owing to the possibility of youngstock incubating the disease, herds with previous evidence of MAP infection will need to have three clear consecutive annual tests before progressing to Level 3.

Where positive animals are identified in herds with no previous history of infection these may be tested by PCR of faeces samples, provided certain conditions are met. Your veterinary surgeon will be able to explain these to you as and when necessary.

Level 3

Objective of Herdsure[®] testing

- To monitor and maintain the improved health status of the herd.

Infected animals can become infectious (i.e. start to shed MAP) without showing signs of Johne's disease. To increase confidence in maintaining a disease-free status, the herd must be monitored for a number of years at Level 3. Every year that the herd is 'monitored negative' increases the degree of confidence that infection has been controlled. The Herdsure[®] system will maintain records to reflect progress within Level 3.

Herds enter Level 3 by three routes:

- negative adult herd testing at Level 1 followed by negative adult herd testing at Level 2a 12 months later.
- following positive results at Level 1, herds have achieved three consecutive negative adult herd tests 12 months apart following disease reduction by identification and removal of infected animals at Level 2b.
- herds with a known history of Johne's disease have achieved three consecutive negative adult herd tests 12 months apart following disease reduction by identification and removal of infected animals at Level 2b.

Continued monitoring

It is essential that a monitoring protocol is put in place so that 'freedom from infection' can be confirmed or, if infection is still present or has been introduced, it is detected. The more 'monitored negative' herd tests achieved, the more confident we can be that infection is no longer/is not present.

At Level 3, testing of individual blood or milk samples from all animals over 2 years of age is performed annually. This will commence 12 months after qualifying from Level 2. Additionally, any added animals must be blood or individually milk sampled annually until achieving four consecutive negative test results.

If an animal dies on the farm and blood or faeces samples cannot be taken, every effort should be made to obtain the ileo-caecal junction and draining lymph node for submission to the nearest AHVLA laboratory, where it can be examined by histology, culture or PCR testing.

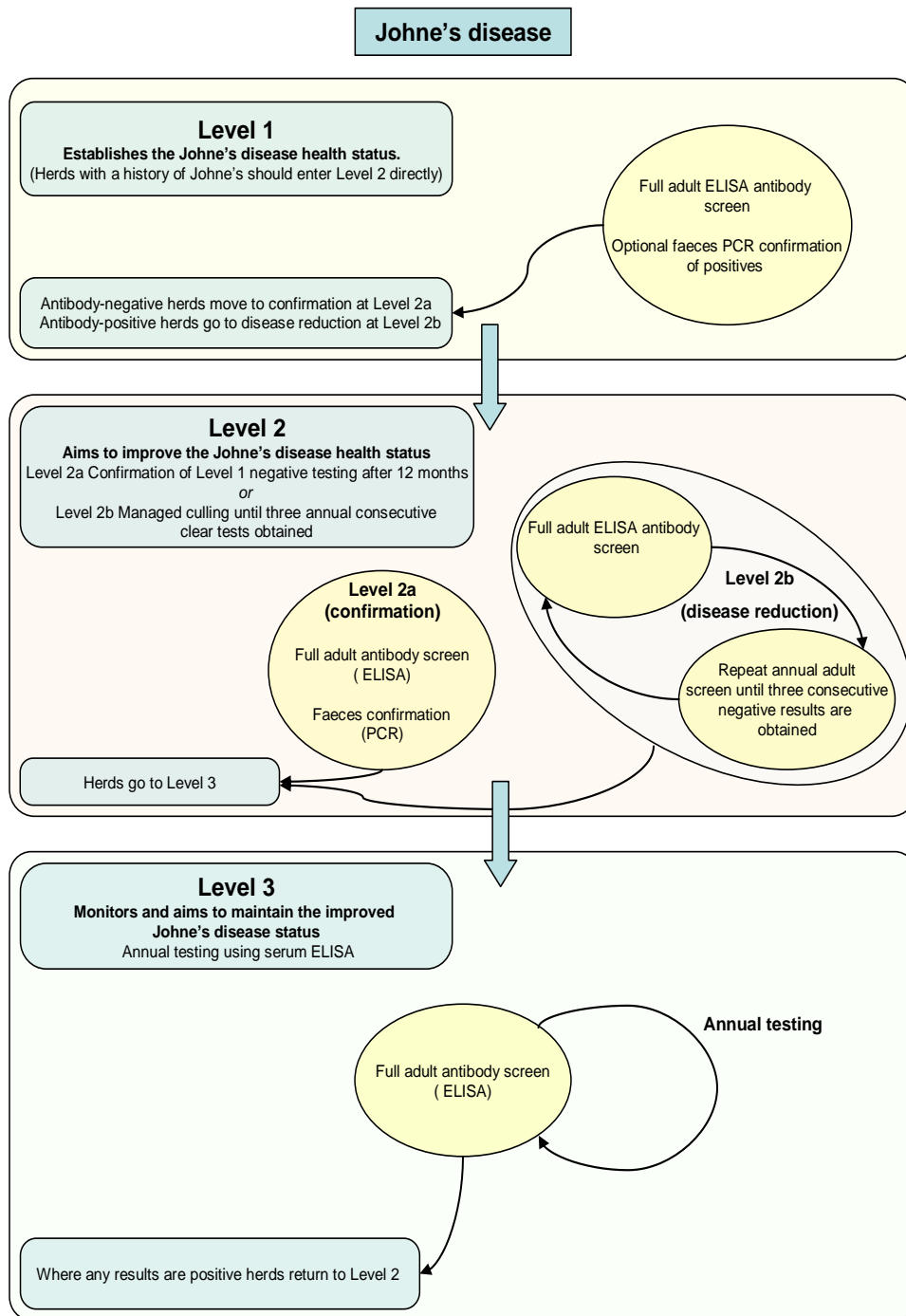
If any animal more than 6 months old presents with clinical signs that may suggest Johne's disease (chronic scour and loss of condition with or without reduced milk reduction), your veterinary practitioner should examine the animal. If Johne's disease cannot be ruled out then the veterinary practitioner will take a sample of blood and faeces. The blood sample will be tested for antibody by ELISA and, if the result is positive or inconclusive, the faeces sample will be screened for the organism. If this gives a confirmed positive result the herd returns to Level 2.

CHeCS accreditation

Accredited free status: A herd is Accredited Free if **three** clear qualifying tests (full herd tests) at an interval of 12 months have been achieved without any reactor being detected. A herd will be eligible for accreditation either following a full herd bleed after 12 months at Level 3 from Level 2a or upon entry at Level 3 from Level 2b. The date the herd first achieved Accredited Free status will be included on the Certificate of Accreditation. Should a herd lose status and then regain it having met the subsequent testing requirements the date on the certificate will be when accreditation was regained.

CHeCS Health Plan – new for 2012/2013

For members working towards CHeCS accreditation a health plan covering Johne's disease must be in place. It must be updated annually and signed off by both the vet and herd owner/manager. On joining the Accreditation Programme the health plan must be submitted to Herdsure® within 2 months of carrying out the herd test. Thereafter the health plan (covering the last year) must be submitted with the herd test. The health plan must cover the three mandatory control elements detailed in the CHeCS Technical Document: 3.1 Antibody positive animals, 3.2 Cull all reactors and 3.3 Offspring of female test positive animals. The veterinary practitioner must detail in writing why any particular guideline has not been followed. For further information, visit www.checs.co.uk



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