



Animal Health & Welfare NI
**Johne's Disease
Control Programme**

www.johnesni.com

Animal Health and Welfare NI Johne's Disease Control Programme

Technical Manual

[This document should be read in conjunction with the Terms and
Conditions of Enrolment]

Background

Johne's disease (JD) is an infectious condition of cattle caused by the bacterium *Mycobacterium avium* subspecies *paratuberculosis* (Map). The disease progresses slowly and leads to increasingly severe damage to the lining of the gut. Obvious signs of disease often only become apparent in adult animals, typically between 3 and 5 years of age. The signs vary depending upon the stage of infection but begin with reduced productivity leading to weight loss, scour and ultimately emaciation and death. Often animals will be culled before the typical signs of a thin scouring adult animal appear. In these cases, Johne's disease could be contributing to an excessively high cull rate.

Calves are more susceptible than adults to acquiring infection. Infection usually occurs either through transmission within the womb from an infected dam or through the consumption of colostrum, milk or food which is contaminated with the bacteria. The bacteria can be present in milk through direct shedding from the cow or through contamination with dung containing Map. Importantly, an infected animal can shed very large numbers of the bacteria into the environment through its faeces. Therefore, the identification of infected cattle and their removal in conjunction with the maintenance of high on farm hygiene standards, particularly around young livestock, is key to the control of infection.

Although the majority of infected cattle acquire infection as calves, they rarely test positive in the first two years of life. Even in older animals the available tests will miss a proportion of infected cattle. For this reason, negative test results should not be regarded as conclusive evidence that an animal (or herd) is uninfected. The programme therefore strongly advises the repeated testing over several years to help build confidence in the true status of the herd.

The technical details of the programme outlined below have been developed by the all-island Johne's Disease Technical Working Group (JDTWG). The JDTWG is an all-island expert group comprising veterinary surgeons and scientists that is responsible for advising on the technical aspects of the JD control programmes for AHWNI and AHI. AHWNI has produced a comprehensive information leaflet on Johne's disease based on JDTWG recommendations. This leaflet together with other material on Johne's Disease is available to view or download from the AHWNI website (www.animalhealthni.com). The AHWNI Johne's Disease Control Programme (JDPCP) draws on international best practice in JD control and seeks to introduce all of the components required to enable effective disease control in Northern Ireland in a structured manner.

Joining the Programme

The AHWNI JDCP is a voluntary programme. Herd owners can enrol most easily at their first on farm Veterinary Risk Assessment and Management Plan ((VRAMP (see below)). AHWNI has designed an online system to allow authorised veterinary practitioners (AVPs) to carry out the VRAMP on farm using a web portal which is accessible by smart phone. The weblink to the online portal can be found at <https://ahwni.wufoo.com/forms/veterinary-risk-assessment-and-management-plan/> or on the AHWNI website <http://www.animalhealthni.com/>.

Before an AVP can carry out the VRAMP or upload any information, the herdowner must first give their consent to participate in the programme. Once the herdowner's consent is uploaded, the herd is from that point enrolled within the AHWNI JDCP. Alternatively herdowners can contact AHWNI directly (028 8778 9126) or by email info@animalhealthni.com.

Objectives of the programme

The objectives of the programme are to provide herdowners with the various programme components, including data handling, diagnostic and on-farm advisory elements, that are required to support a robust and internationally recognised Johne's Disease control programme in Northern Ireland. The key goals of the programme are:

- a. **Bioexclusion.** To help identify those herds that test negative for Johne's disease and provide these farmers with the knowledge and professional support to allow them to increase their confidence over time of being free of infection and to protect their herds from the on-going risk of introduction of this disease.
- b. **Biocontainment.** To provide herds identified by the programme, or otherwise, as being infected or having a low confidence of freedom from infection, with the knowledge and professional supports to allow them to control and reduce the prevalence of the disease over time and ultimately to achieve a high confidence of freedom from infection.
- c. **Market reassurance.** To underpin the quality of Northern Irish animal produce in the national and international marketplace.

In addition, the programme will generate information in relation to the control of Johne's disease on farms in Northern Ireland, including that relating to the economics of the disease and its control. This information will be used to assist the future development of the AHWNI Johne's Disease Control Programme.

Programme duration and review

International experience has shown that the control of JD is achievable, but that the timeframe required is long, being measured in years. For herdowners to maximise the value of engaging in the programme it is important that they continue to participate in the programme over several years. AHWNI will keep under continual review the programme to ensure that, as far as possible, it meets the needs of herdowners and fulfils the objectives as described above.

Required components of the programme

The required components of the programme are as follows:

1. Programme enrolment including acceptance of programme Terms & Conditions.
2. The provision by an approved veterinary practitioner of an on-farm risk assessment and management plan (VRAMP).
3. Uploading to AHWNI of VRAMP findings and recommendations.
4. Limitation on the sale of JD positive/inconclusive animals.

In addition to the mandatory components it is strongly advised that participating herds undertake whole herd testing for the infection. Recommendations on what testing is currently advised by the JDTWG is detailed below.

Veterinary Risk Assessment and Management Advice

This is a detailed on-farm review carried out by an approved veterinary practitioner in partnership with the farmer to

1. identify aspects of management that could predispose to the introduction (bio-exclusion) and spread of infection within the farm (biocontainment)
2. provide recommendations for the reduction of these risks.

Only veterinary practitioners who have undergone specific training provided by AHWNI will be approved by AHWNI to undertake the assessments. A list of these veterinary practitioners is available from the AHWNI website or by contacting AHWNI directly.

The VRAMP uses a scoring system which assists the identification of high-risk practices and areas within the farm on which control should be focussed. As a consequence of the assessment, up to three agreed farm-specific practical recommendations are made to reduce infection risk that both the farmer and the AVP agree can be implemented on the farm.

In conducting the risk assessment, the approved veterinary practitioner should review with the herd owner risks associated with infection introduction, establishment and spread. Where tests have been carried out an assessment of the results should be made, and further actions agreed that may be needed to further investigate the infection status of the herd.

AHWNI has developed an online tool to facilitate the carrying out of the VRAMP. This can be accessed online using a smartphone. The purpose of this is to assist with the carrying out, recording, and uploading of the VRAMP in real time on farm. Where the online portal cannot be accessed (e.g. where there is no mobile signal), the VRAMP can be carried by hard copy. However, to comply with the programme all findings must be uploaded to AHWNI.

After herds have completed an initial VRAMP a follow-up risk assessment should be carried out every subsequent 12 month period. These follow-on assessments are essential to monitor progress that the herd may have made in mitigating Johne's disease related risks. This can be achieved by comparing scores attributed to risks in previous VRAMPs and measuring the degree to which the management plan has been successfully carried out so that changes in recommendations can be made where

necessary. Each annual assessment will also assist with the identification and mitigation of new risks that may have emerged on the farm.

Laboratories

While currently testing is not mandatory within the programme, it is strongly recommended. AHWNI recommends that any laboratories carrying out testing in support of the programme use internationally recognised tests carried out to the ISO 17025 standard.

AHWNI currently recommends those tests that are approved by the Friedrich Loeffler Institute (FLI) or otherwise certified by FLI as approved for the purpose intended (with certification to batch level). A list of these can be found on the FLI website:

<https://www.fli.de/en/institutes/institute-of-molecular-pathogenesis-imp/reference-laboratories/nrl-for-paratuberculosis/>

Laboratories providing diagnostic testing should be approved to carry the tests out to the ISO/IEC 17025 standard. Details of the ISO approval of laboratories and the tests they carry out can be found at the UKAS or INAB websites:

https://www.ukas.com/list-all-organisations/?org_type=2&parent=Testing%20Laboratories

<https://www.inab.ie/Directory-of-Accredited-Bodies/Laboratory-Accreditation/Testing/>

Testing

All animals in the herd over 2 years of age on the date of screening should be tested and the herd screen completed within 12 months of enrolment or within 12 months of the previous herd screen.

Currently the two tests that are recommended for herd screening within the AHWNI JDCP are:

- Individual animal milk ELISA
- Individual animal blood ELISA

In addition, two tests are recommended as ancillary tests:

- Individual animal faecal culture
- Individual animal faecal PCR

Herd Screening

Each eligible animal should be tested at least once each year. A herdowner may test more frequently than this in order ascertain the infection status of the herd more rapidly. In this case AHWNI recommends that consecutive herd screening tests should be at least 3 months apart (e.g. if milk recording samples are being used that testing should be carried out no more frequently than every quarter).

Milk samples collected for the purposes of milk recording can be used to screen for Johne's disease. In this case the herd owner should contact the relevant laboratory in advance of milk sampling. Where the herdowner is seeking to demonstrate to another agency a high confidence of infection freedom,

all samples collected for testing may require to be collected by or under the supervision of an independent third party.

Although the majority of infected cattle acquire infection as calves, they rarely test positive in the first two years of life. Even in older animals the available tests will miss a proportion of infected cattle. For this reason, negative test results should not be regarded as conclusive evidence that an animal (or herd) is uninfected. For this reason, the programme recommends repeated testing over several years to help build confidence in the true status of the herd.

Herds that are using milk testing may need to undertake a number of blood tests for those animals that were or will not be tested by milk (e.g. bulls or cows where samples were not taken for milk recording).

Herds that choose to use one sample type can use a different sample type in subsequent years.

Ancillary Testing

Faecal testing using either culture or PCR is valuable to help ascertain the presence of infection. These tests are therefore most useful when applied to animals that have already tested positive by blood or milk. The primary purpose of ancillary tests is to confirm the presence of infection **in the herd**.

Ancillary tests, just like milk and blood tests, have limited sensitivity. Therefore, a negative ancillary test does not provide evidence of absence of infection. In general, animals with high titre readings on blood or milk tests will be most likely to be shedding detectable levels of the organism. Where a herd has a number of milk or blood test positive animals and is unable to faecal test all of the positive animals, a selection of the animals with the highest readings should be chosen for faecal testing. Once a herd has at least one positive faecal test, it confirms that infection is present in the herd.

A phenomenon known as ‘pass through’ has been seen on occasion in infected herds. This is where an uninfected animal consumes and excretes the organism or the organism’s DNA in the faeces. In this case the animal may test positive on faeces but actually be uninfected. It is believed that this phenomenon is more common with PCR. For this reason, AHWNI recommends that ancillary tests are performed on milk or blood test positive animals. The risk of them being uninfected and displaying pass through is minimal. In any event where ‘pass through’ does occur, it confirms that infection is present in the herd.

Sample Timing & Result Interpretation

Where possible, cattle should not be milk or blood sampled within 90 days of the first day of the TB skin test as this can lead to false positive JD test results. Where this has happened all animals testing positive for the first time should be tested again, using either a dung sample (which may be taken immediately) or a further blood or milk test (taken more than 90 days following the TB skin test). If this further test is negative, the animal can be considered to be negative. Where testing cannot be done more than 90 days after a TB test (e.g. in ongoing TB reactor herds) JD tests should be done as many days as possible after the TB test. Herdowners should be aware that all JD test results must be interpreted carefully taking account of test and herd history as well as management practices on the farm. They should always be interpreted by the herdowner’s veterinary practitioner.

Milk samples from the first 7 days of lactation should not be tested as milk taken during this period can lead to false positive results. Where a sample has been taken during this period, any animals testing positive should be subjected to a further screen using one of the recommended tests. If this further test is negative the animal can be considered to be negative.

An ELISA test on blood or milk should be classified as positive using the test cut-off recommendations of the manufacturer of the test kit that is being used. A faecal sample culture result should be classified as positive following molecular confirmation of any suspect bacterial growth. A faecal sample PCR test should be classified as positive based on the recommendations of the test kit manufacturer.

While the blood and milk tests do yield false positive results (i.e. an uninfected animal testing positive) any animal that tests positive on blood or milk should be regarded as a potentially infected animal and therefore a potentially infectious risk to other animals. Ancillary testing of a faecal sample by culture or PCR can be used to clarify the animal's infection status. However, a negative ancillary test does not preclude the possibility of the animal being infected. Such animals should still be treated as an infectious risk.

Sale of JD positive animals

Herd owners participating in the programme should not permit the sale of any animal that is deemed to have provided a positive or inconclusive result in the preceding year except to a licensed slaughter premises, feedlot or herd from which animals are exclusively sent to slaughter. Exceptions to this are

- animals that yielded a positive or inconclusive result within 90 days of a TB skin test and subsequently had a negative blood or milk test result.
- animals that yielded a positive or inconclusive milk result test within 7 days of calving and subsequently had a negative blood or milk test result.

Programme Compliance

All herds within the programme agree to have a veterinary risk assessment and management plan (VRAMP) completed and uploaded to AHWNI every 12 months.

Definitions

AHI	Animal Health Ireland
AHWNI	Animal Health and Welfare NI
Ancillary Test	A faecal test (culture or PCR) undertaken to help resolve the status of an ELISA test-positive or test-inconclusive animal.
AVP	Approved Veterinary Practitioner. A veterinary practitioner approved by AHWNI for the purposes of Johne's Disease Control Programme.
Biocontainment	Farm practices that prevent the spread on infection within a farm (e.g. high calf hygiene standards).
Bioexclusion	Farm practices that prevent the introduction of infection onto a farm (e.g. a closed herd policy).
Eligible cattle*	Those cattle that are recommended for testing which are all cattle over 24 months of age at the time of sampling.
ELISA	Enzyme Linked Immunosorbent Assay. A rapid laboratory test that detects the presence of antibodies to the bacterium which causes Johne's Disease in either milk or blood.
JD	Johne's Disease
JDCP	Johne's Disease Control Programme.
JDIG	Johne's Disease Implementation Group
JDTWG	Johne's Disease Technical Working Group
Map	<i>Mycobacterium avium</i> subspecies <i>paratuberculosis</i> . The causal agent of Johne's disease.
Negative Whole Herd Test	Where every eligible animal is ELISA-negative, or where there is one or more ELISA-positive or ELISA-inconclusive animal(s), every one of these ELISA-positive or ELISA-inconclusive animals is subsequently faecal culture or faecal PCR-negative.
PCR	Polymerase chain reaction. A rapid test which detects the genetic material of the MAP organism
VRAMP	Veterinary Risk Assessment and Management Plan conducted by an AVP to identify risk factors for the spread of JD into and within the herd, and to identify and prioritise actions to reduce those risks.

Whole herd test (WHT)

Screening test of all eligible cattle in the herd by ELISA testing on milk or blood samples.

*Animals over the age of 2 years on the farm may be exempt from testing in a whole herd test if they are:

- Non-breeding, and
- Maintained in a physically separate biosecure unit.

To remove doubt, these animals must be continuously maintained in pastures and pens which are not used to graze or house any breeding animals or young stock in the herd intended for breeding. This separation applies to lifetime separation (e.g. a beef finishing unit on a separate out-block), not just the separation of cull cows for fattening.

DISCLAIMER. Neither AHWNI nor any stakeholder, collaborator, officer, agent, sub-contractor, or employee of AHWNI or any member of the JDTWG or JDIG

1. have any liability or responsibility in respect of any error or omission in connection with the use, processing or publication of any JD Control Programme Data or otherwise in connection with the AHWNI Johne's Disease Control Programme or any loss or damage thereby incurred by any person provided that upon being made aware in writing of any error AHWNI shall procure the making good of such error as soon as practically possible and insofar as is within its powers.
2. shall be deemed to give any representation or warranty as to the accuracy of any JD test methods or test results.
3. shall have any liability or responsibility in respect of any laboratory or the accuracy of any test methods, test results or reports produced by any laboratory.

No representation or warranty is given by AHWNI, the JD TWG or the JD IG or any other person involved in the Programme as to the standing or quality of any laboratory or the accuracy or efficacy of any of the JD Tests proposed for the Programme.

AHWNI, the JDTWG or the JDIG shall not have any liability to the Participating Herdowner for indirect or consequential damages or for damages for loss of profits arising out of or in connection with the AHWNI Johne's Disease Control Programme or the implementation thereof whether in relation to the carrying out of tests, the reporting of test results or otherwise whatsoever.

AHWNI, the JDTWG or the JDIG shall not have any liability or responsibility in connection with any of the acts or omissions of any veterinary practitioner whether in connection with the Programme or services carried out in connection therewith or otherwise.