Animal Health and Welfare Northern Ireland
Johne’s Disease Control Programme for Dairy Herds
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.

Infection usually occurs either through transmission within the womb from an infected dam or through the consumption ofcolostrum, 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 dung. 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. The Johne’s Disease Technical Working Group (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 programme. AHWNI has produced a comprehensive information leaflet on Johne’s disease based on JDTWG recommendations. This leaflet is provided to all farmers enrolling in the programme and is available to view or download from the AHWNI website (www.animalhealthni.com).

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 requires 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 JDTWG. The AHWNI JDCP for dairy herds 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 AHWNJ DCP is a voluntary programme. Herd owners wishing to enrol in the programme may do so by contacting AHWNJ directly (028 8778 9126) or by email info@animalhealthni.com.

Objectives of the programme

1. 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 with the following goals:
   
a. **Bio-exclusion.** To 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. **Bio-containment.** 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 dairy produce in the international marketplace.

2. To generate information in relation to the control of Johne’s disease on dairy farms in Northern Ireland, including that relating to the economics of the disease and its control, in order to assist the future development of the AHWNJ Johne’s 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. AHWNJ 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. Where changes occur to the programme participating herdowners will be informed of these changes in advance of their coming into effect.

Required components of the programme

The required components of the programme are as follows:

1. Programme enrolment
2. Herd screening
3. Testing of samples in designated laboratories
4. Transfer of test results to AHWNJ
5. Limitation on the sale of JD positive/inconclusive animals
6. The provision by an approved veterinary practitioner of on-farm risk assessment and disease management advice.
Designated Laboratories

AHWNI will establish a list of designated laboratories (available from the AHWNI website) to provide testing to the programme.

Herd Screening

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

Milk samples collected for the purposes of milk recording can be used to screen for Johne’s disease within the terms of the programme. In this case the herd owner should contact the relevant laboratory in advance of milk sampling. Where the herd owner is seeking to demonstrate to another agency a high confidence of infection freedom, all samples collected for testing must 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 requires repeated testing over several years to help build confidence in the true status of the herd.

Currently four tests are approved for herd screening within the AHWNI JDCP. These are;

- Individual animal milk ELISA
- Individual animal blood ELISA
- Individual animal faecal culture
- Individual animal faecal PCR

Each eligible animal should be tested each year by a laboratory designated for this purpose by AHWNI, using the sample types and frequencies set out in the table below. It should be noted that a herd owner may test more frequently than this in order ascertain the infection status of the herd more rapidly.

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>Blood</td>
<td>Once per year</td>
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<tr>
<td>Milk</td>
<td>Twice per year</td>
</tr>
<tr>
<td>Faeces</td>
<td>Once per year</td>
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</table>

Farms that have been participating in herd screening (as defined above) prior to joining the programme may have these historical results transferred to AHWNI provided the laboratory that conducted the testing is now designated and the samples were appropriately identified. Herdowners wishing to have such results transferred to AHWNI should contact the relevant laboratory to request that this transfer is effected.

Herd owners that choose to use one sample type can use a different sample type in subsequent years.
Sample Timing & Result Interpretation

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

Where possible, cattle should not be milk or blood sampled within 3 months of a TB skin test, including the second day of a 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 3 months following the TB skin test). If this further test is negative, the animal will be considered to be negative.

Similarly, 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 will be considered to be negative.

Where cattle are tested using two milk samples, the samples should be taken at least 90 days apart.

A positive test result will define an animal as infected. However, where an animal tests positive to either the blood or milk test there is the facility to further investigate the animal’s infection status by ancillary testing of a dung sample by culture or PCR performed at a reference laboratory. If this ancillary test is negative, the animal will be defined as having an indeterminate disease status and will be classified as inconclusive except where:

- the original test was performed within 3 months of a skin test, or
- where a milk sample was taken during the first 7 days of lactation

in which cases the animal will be considered to be negative.

Only herds with positive ancillary test results will be classified as infected. Where an animal has an initial positive test result but no ancillary test is performed the animal will be considered infected.

In some cases, the ELISA test result may be inconclusive. Where an animal has an inconclusive ELISA test result on either milk or blood samples the animal’s infection status will be classified as inconclusive.

Reporting of Results

Laboratories will report results by email to AHWNI. Test results may be Negative, Positive, Inconclusive or Unsuitable (where there is either inadequate material to test or the material is not in an adequate state to test). 95% of blood and milk results should be reported by labs to AHWNI within 7 days of sample receipt and 99% reported within 10 days of sample receipt (these turnaround times form part of the conditions under which laboratories are designated within the programme). For faecal culture results 95% of results should be reported within 10 weeks of sample receipt and for PCR 95% of results should be reported within 7 days of sample receipt.
**Sale of JD positive animals**

Herd owners participating in the programme shall not permit the sale of any animal that is deemed to have provided a positive result, in accordance with the definitions provided above (see ‘sample timing and result interpretation’), except to a licensed slaughter premises.

**Inconclusive animals**

Where an animal tests positive using either a blood or a milk sample but negative using an ancillary test, or tests inconclusive using blood or milk, it will be classified as inconclusive. An animal will remain inconclusive for a minimum of 1 year from the date it first had a positive test result. If after one year it has a negative test result or results from a subsequent annual cycle of testing, the animal will be classified as negative. If the animal continues to test positive it will be treated in the same way as any other animal with a positive test result, i.e. classified as infected unless subjected to a subsequent ancillary test. If this ancillary test is again negative the animal will continue to be classified as inconclusive. Similarly, where an animal has an inconclusive ELISA test result its infection status will be classified as inconclusive.

For as long as an animal is classified as inconclusive it will not be permitted for sale except to a licensed slaughter premises.

**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 identify aspects of management that could predispose to the introduction (bio-exclusion) and spread of infection within the farm (bio-containment) and 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 first such risk assessment must be carried out within 15 months of enrolment into the programme.

The risk assessment and disease management component uses a scoring system which assists the identification of high-risk practices and areas within the farm on which control should be focussed. The assessment will lead to a small number of agreed farm-specific practical recommendations to be implemented on the farm.

In conducting the risk assessment, the approved veterinary practitioner should review with the herd owner animal movement history to identify the impact of such movements on the risk of introduction of infection, the confidence that a negative screening test indicates that the herd is truly free from infection and the importance of implementing the agreed recommendations.

**Programme Compliance**

All herds within the programme agree to have all eligible animals tested within one year of enrolment and an on-farm disease management and risk assessment visit completed within 15 months of the herd’s enrolment date or the date of the previous V-RAMP.
### Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>Approved Veterinary Practitioner</td>
<td>A veterinary practitioner approved by AHWNI for the purposes of the pilot Johne’s Disease Control Programme.</td>
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<tr>
<td>Bio-containment</td>
<td>Farm practices that prevent the spread of infection within a farm (e.g. high calf hygiene standards).</td>
</tr>
<tr>
<td>Bio-exclusion</td>
<td>Farm practices that prevent the introduction of infection onto a farm (e.g. a closed herd policy).</td>
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<tr>
<td>Designated Laboratory</td>
<td>A Lab that has been designated by AHWNI and whose results will be accepted for the purposes of the AHWNI-JDCP. The current list of designated laboratories is available at <a href="http://www.animalhealthni.com">www.animalhealthni.com</a></td>
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<tr>
<td>Eligible cattle</td>
<td>All cattle over 24 month of age at the time of sampling.</td>
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<tr>
<td>ELISA</td>
<td>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.</td>
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<td>JD</td>
<td>Johne’s Disease</td>
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<td>JDCP</td>
<td>Johne’s Disease Control Programme.</td>
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<td>JDIG</td>
<td>Johne’s Disease Implementation Group</td>
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<td>JDTWG</td>
<td>Johne’s Disease Technical Working Group</td>
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<tr>
<td>Map</td>
<td><em>Mycobacterium avium</em> subspecies <em>paratuberculosis</em>. The causal agent of Johne’s disease.</td>
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<tr>
<td>PCR</td>
<td>Polymerase chain reaction. A rapid test which detects the genetic material of the MAP organism.</td>
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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 AHWI 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 AHWI, 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.