Testing for Johne's Disease

national milk laboratories

Due to the nature of Johne's disease, accurate identification of infected animals is often difficult. In particular infected animals in the early stage of the disease are unlikely to shed *Mycobacterium avium* subspecies *paratuberculosis* (MAP) or produce a detectable antibody response. In the later stages of Johne's disease, cows will often shed MAP and exhibit peaks and troughs of antibody production until reaching the clinical stage of the disease.

There are two categories of Johne's disease testing:

1 IDENTIFYING THE MAP ORGANISM ITSELF

2 LOOKING FOR THE ANIMAL'S ANTIBODY RESPONSE TO THE DISEASE

It should be noted that there is no recognised 'gold standard' test for Johne's disease; subclinical animals may test negative to all currently available diagnostic tests.

- The terms 'sensitivity' and 'specificity' are used to describe the accuracy of a test.
- Sensitivity (Se) is defined as 'the ability of a test to correctly identify diseased animals as test positive (true positive)' i.e. the proportion of **diseased** animals that **will react** to the test.
- Specificity (Sp) is defined as 'the ability of a test to correctly identify **non-diseased** animals as **test negative** (true negative)'.

Johne's disease tests are very specific meaning that we see very few false positive results; so if a cow tests positive then it is highly likely that she has Johne's and should be treated as a risk. Retesting positive animals using a different test to confirm their status is not generally recommended unless the herd is thought to be low risk. When considering testing regimes for your farm you should seek the advice of your vet.

Available Johne's Tests

Testing options are available to suit any herd regardless of whether or not you milk record.

1 Tests identifying the MAP organism itself

Test type	Sample	Reliability	Pro's	Con's
Culture	Faeces	Se 30-50% Sp > 99.9%	No false positives. Positive result is diagnostic. Good confirmatory test.	Expensive. Up to 14 weeks for a result. Poor sensitivity especially in young / subclinical animals or light / intermittent shedders.
PCR	Faeces	Se 30-50% Sp > 99.9%	Rapid turnaround. No false positives. Positive result is diagnostic. Good confirmatory test.	Expensive. Poor sensitivity in young / subclinical animals or in light / intermittent shedders.
	Bulk Milk		Rapid turnaround. No false positives Positive result is diagnostic.	Poor sensitivity due to number of animals contributing to tank and nature of shedding. No information about disease prevalence. Contamination vs direct shedding into milk.

2 Tests looking for the animal's antibody response to the disease

Test type	Sample	Reliability	Pro's	Con's
ELISA	Blood	Se 40-80% Sp > 99%	Simple and relatively cheap test.	Need to take blood sample so may be reluctance to sample frequently due to cost and handling cows.
	Bulk Milk	Se 20-30% Sp > 99%	Cheap and easy. Positive shows evidence of Johne's infection on farm.	A negative result may be obtained even when positive cows are present, due to the number of cows contributing to the tank and the intermittent nature of antibody production.
	Individual Milk	Se 40-80% Sp > 99%	Easier to obtain than blood samples so ability to test more frequently.	Need for accurate ID of samples.

Testing for Johne's disease is not straightforward due to the low test sensitivity in the early stages of disease, the intermittent shedding of MAP and production of antibodies. There are pro's and con's to all of the currently available Johne's disease tests and none of them are perfect, however this should not detract from the fact that these tests can be used to enable effective Johne's disease control on farm.

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For further information on testing options please visit **www.nationalmilklabs.co.uk** or **www.actionjohnesuk.org**

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