

## Fact Sheet: Bulk tank milk screening

### Why does the *Mycoplasma bovis* Eradication Programme do bulk tank milk (BTM) screening?

The routine screening of bulk tank milk samples for indications of *Mycoplasma bovis* (*M. bovis*) infection has contributed significantly to the progress made towards eradicating *M. bovis* from New Zealand.

Bulk tank milk screening has been conducted regularly since July 2019. It provides an opportunity for the Programme to identify infected dairies outside the traced network of infected farms.

Background Surveillance (BTM screening and National Beef and Drystock Surveillance) will continue throughout all phases of the eradication Programme and will be a key component in providing the confidence needed to declare New Zealand free from *M. bovis*.

### Does industry support BTM screening?

Our Programme partners (DairyNZ and Beef + Lamb New Zealand) and the Dairy Companies Association of New Zealand (DCANZ) support the ongoing screening of bulk tank milk samples.

### How is MPI able to test bulk tank milk samples?

MPI has provided a legal direction under the Animal Products Act 1999, which requires each dairy processor to provide bulk tank milk samples for *M. bovis* testing.

### Why is screening being done year-round?

Many factors influence our ability to detect antibodies produced by infected cows. Factors include the number of infected cows contributing to the milk supply, the stage of infection, average milk production per cow and vat volume.

Ongoing screening is important to identify recent infection. Throughout the milking season there are many opportunities for *M. bovis* to enter a herd including buying in new stock, heifers returning from grazing, introduction of bulls, and break-ins from neighbouring properties. To eradicate *M. bovis* from New Zealand, we need to be constantly scanning for evidence of infection.

Regular screening is conducted throughout the year, with increased frequency during July, August, and September. An analysis of BTM screening data has shown that the ability of the ELISA test to detect infection (sensitivity) is highest in the first 30 days of milking. With heifers entering the milking herd for the first time during these months, there is increased opportunity for us to detect infected animals quickly when we test on a fortnightly basis.

It is important that dairies are screened at different stages of the lactation cycle to give us the best chance of detecting infected dairies.

## How does BTM screening work?

The initial screening test used is an ELISA (enzyme-linked immunosorbent assay). The ELISA looks for antibodies that the cow has made to fight off *M. bovis*. Antibodies produced by the cow will end up in milk. The ELISA test has been designed to be highly targeted to detect *M. bovis* antibodies.

If a bulk tank milk sample is reported with a 'detect' result, this means that there is an indication that antibodies are present. This is **not** a confirmation of infection. A detect result indicates that further on-farm investigation by the Programme is required to determine the true infection status of the milking herd.

The PCR test may also be used on samples with suspicious ELISA results to look for further evidence of infection.

## How reliable is the test?

Over 99.7% of all dairies screened with the ELISA have non-detect results. This is due to a low number of infected dairies throughout the country and the high specificity of the test.

Less than 0.3% of all dairies screened give a detect result.

A highly specific test gives an extremely low rate of false-positive test results. There is no evidence that antibodies to other bacteria found in NZ cause detect results on the ELISA test. Antibodies to other pathogens such as those that cause leptospirosis and tuberculosis are also unlikely to result in a false positive ELISA test result.

We don't know exactly what causes false-positive results on the bulk tank milk screen. However, we do know that farms with a detect result are at a higher risk of being truly infected, than farms with a non-detect result. This is why we need to investigate all detect results. It is essential that bulk tank milk screening continues to help find the few remaining infected farms.

## Do I need to do anything for the bulk tank milk surveillance like take samples?

No, the screening is performed on samples routinely collected for composition and component testing. The *M. bovis* testing does not interfere with the testing needed for your milk payments.

## What determines a detect result?

A herd is considered to have an ELISA 'detect' result if a single sample has an ELISA sample-to-positive (S/P) ratio of 30% or more, or two consecutive samples with an S/P ratio of 20% or more.

We regularly review the thresholds for detect results using the information and data that we gather from previous BTM screening results. This is to ensure that all follow up on-farm investigation is absolutely essential, and we do not interrupt farming operations without good reason.

## **What happens if my farm has a detect result?**

Farms with a detect result will be placed under a Notice of Direction (NOD), restricting cattle movements while on-farm blood sampling of the herd is done to determine if the herd is infected.

The movement restrictions are necessary because they stop the movement of animals which might be infected, before they can spread infection to other farms.

We appreciate how disruptive this can be to farming operations, especially during busy periods like calving. We assign a designated case manager, who will be the primary point of contact. Our Farmer support advisers, DairyNZ and the local Rural Support Trust are also on hand to offer support and advice.

We work with farmers to get the sampling done as quickly as possible, and at a time that works alongside routine operations. Most farms only require one round of testing to determine that they are not infected. A small number of farms will require two or more rounds.

It takes two positive rounds of on-farm sampling for a herd to be diagnosed as infected.

A 'census' of all cattle on your property may be required. A census gives the Programme an opportunity to identify cattle that may have moved off infected properties but are not recorded in NAIT. If a census is required and finds any risk events or animals of interest that require further investigation, additional sampling on-farm may be required. The census can be completed after the NOD is revoked, if not already completed.

## **On average, how long does it take to get through the NOD and testing process?**

Generally, over 95% of bulk tank milk detects determine no infection is present after on-farm investigations are completed. However, we need to ensure that all risk of infection is investigated to prevent undetected infection spreading within the farming community.

The Programme works to get farmers through on-farm investigation, including testing and out of the Programme as swiftly as possible. In 2020, on average it took around 20 days to complete testing and have movement restrictions lifted, when on-farm investigation confirmed *M. bovis* was not present. More recently we have been able to progress properties through the Programme much quicker – we aim to get farmers back to business as usual as quickly as we can, with as little disruption as possible.

## **Which cows are you going to sample?**

The sampling criteria is specific to each farm and is determined by the makeup of the different animal management groups on the farm, and which animals were supplying into the bulk tank within the same milking season that the sample was taken.

Because each farm's sampling is different, the Sampling team that takes the samples and your case manager will talk to you about which animals are required to provide samples.

The sampling is designed to determine if the management group is infected, not individual animals, which is why not all animals may need to be tested. All cattle in the sick mob will be tested.



## Can a farm have multiple detect results?

The risk of *M. bovis* to farms can change over time as new cattle are introduced. Animals may have been co-grazing, bulls introduced for mating or there have been breakouts or break ins with neighbouring stock. This is why the BTM screening occurs throughout the season - to continuously monitor for new incursions into milking herds. A further detect result may signal an actual true positive result. All detect results need to be considered, even if the farm has previously tested as negative.

Bulk tank milk ELISA screening has been operating since 2018. As dairies are repeatedly screened, there is a small chance that a farm may have more than one detect result over time. The number of detect results reported are extremely low and the number of dairies with more than one detect result are even fewer.

We consider every bulk tank milk detect result on a case-by-case basis. A prior negative on-farm result does not rule out the need for us to come back on-farm and test for a subsequent detect result, particularly if there has been any opportunity for the introduction of infection since the last investigation.

The decision to come back on farm is not made lightly. A number of factors are assessed in the decision-making, including the time elapsed since the last investigation and any associations the farm has had with an infected farm.

## What if sick cows aren't providing milk into the bulk milk sample?

Sick, lame or antibiotic-treated cows that aren't supplying for pick up will not contribute to the sample. In an infected herd, there will be a mixture of sick and non-sick cows. There will still be cows contributing antibodies to the sample so this should not impact on the test's ability to identify the infection within a herd. As screening is ongoing, recovered cows put back into the milking herd will be included in the next round of testing.

## What happens to calves on farms under a Notice of Direction?

Under a Notice of Direction calves cannot leave the farm, except to be bobbied (a permit is required to do this, which you can request through your case manager).

## What about animals that have recently left a farm determined to be infected?

If we determine that your herd is infected, then we will trace the cattle movements that have occurred off your farm during the time that we believed it was infected. Those animals of interest may be culled (as they were part of an infected herd), and the cattle they've come in contact with, will be tested.

## Is there compensation for losses?

Farmers are eligible for compensation for certain losses incurred while under a legal notice such as a Notice of Direction and affected farmers are encouraged to talk to [DBCAT](#) (DairyNZ and Beef + Lamb New Zealand Compensation Assistance Team) early in the process. DBCAT provides free assistance preparing compensation claims and valuable advice about the compensation process. Your case manager will be able to offer you assistance.

For more information on the *M. bovis* Eradication Programme, visit: [mbovis.govt.nz](http://mbovis.govt.nz)