

Veterinary practitioners and on-farm Tb management groups

S Hutchings

Abstract

As the prevalence of Tb decreases in our deer herds the focus on control needs to shift from a regional to a farm focused approach. The Animal Health Board (AHB) has identified that a significant reason for a number of deer herds remaining with an infected status is the failure to complete two Tb tests within a one year period as recommended.

The most common explanations given by deer farmers are:

- *the difficulty of fitting two tests in within normal farm management constraints,*
- *the costs associated with completing a second test.*

The Animal Health Board (AHB) with the support of the New Zealand Game Industry Board (NZGIB) and the Deer Farmers Association (DFA) have recognised that the establishment of individual farm management plans for farms that are defined as having a chronic Tb infection is the best way of overcoming the problem. The primary aim of this plan is to increase the testing frequency to optimal levels and to apply sound epidemiological principles in the Tb control programme on that property.

The farmer's veterinary practitioner has been offered a role in the development of these management plans. They are in a position of trust as animal health advisor on the property, they usually have an intimate knowledge of the local area, and should be able to bring epidemiological management tools to the development of the plans. This paper is designed to background the reasons for this AHB initiative, the plan implementation process, plus help provide some of the tools for the practitioner.

Analysis of risk factors for persistent infection of herds

An analysis on the effect of area vector status, herd size, period between whole herd tests, and use of ancillary serial tests was conducted by Terry Ryan of the AHB. A multivariate technique was used to control for possible confounding effects of variables and/or interactions between them. All factors analysed except serial testing were found to have a significant ($p < 0.01$) effect on the rate of clearing infection from herds. The most significant results were:

The odds of clearing infection with short-interval testing (mean of 2 to 7.5 months) was 5 times that with long interval testing (15 to 24 months). For medium interval testing (7.5 to 15 months) it was around twice the odds.

Large herd size appears to have an effect. The odds of clearing infection in both small (less than 100 deer) and medium (101 to 500) herds was around twice that of clearing Tb from large herds (500 or more).

The odds of clearing herds in vector free areas were about twice the odds of clearing herds in vector risk areas.

Individual herd management plans

Given the above statistics it is often beneficial (especially in cases of spreading infection) to have the shortest inter-test interval possible rather than waiting six months. This planning has to be combined with knowledge of other on-farm management systems.

Deer farmers experience difficulties both with farm management systems and economically, in achieving more than one test annually. The AHB has developed financial incentives for completing a second test within one year. Currently the AHB will reimburse expenses of \$2.50 per head for Tb testing eligible deer for the second whole herd test within one twelve

month period. The test must be at least 60 days after the completion of the first test. The AHB has also agreed to pay the expenses involved in initiating, conducting and recording on-farm Tb management plans on eligible infected deer properties. This includes the Veterinary Testing Officer's fees and expenses.

Eligible properties

- Infected deer herds that have Tb diagnosed at any test after the initial breakdown episode and fit one of the following criteria, are to have an individual management plan:
- The herd is located within a Vector Free Area (VFA); **or**
- The herd is within a Vector Risk Area **and**
- The farm is either within an AHB vector operation or will be subject to an AHB funded vector program within the current or subsequent financial year (1 July to 30 June)

Management Group participants

- Deer herd owner and/or the appointed agent or manager.
- AHB approved regional Disease Control Manager (DCM).
- AHB approved Tb Testing Agent/Veterinary Practitioner. The veterinary practitioner will represent the practice that undertook the Tb testing of the herd in question.

Other participants

Vector Control Manager (VCM). Where the DCM suspects that vectors are involved in the infection, or where the farm is part of an ongoing vector control operation, or where it is felt that it will be beneficial to achieving the stated outcomes of the group then the Vector Control Manager will be invited to the planning meeting.

Veterinary Practitioner who is not the Tb Testing Officer. If the herd owner/agent/manger wishes to invite their veterinary practitioner to participate in the Tb Management Group then this can occur but is not funded by the AHB. The herd veterinarian often possesses local knowledge, has the trust of the farmer and will have historically been acting as the farm advisor for all animal health problems and involved in farm production planning. In this situation reimbursement for the veterinarians time and disbursements will be between the herd owner and their veterinarian.

Contracted Vector Control Agent. Where it will be beneficial to the achievement of planning meeting outcomes to have the local vector control operators present they should also be invited to participate in the group.

Management plans

These plans will have a number of components:

Investigation

Using epidemiological knowledge obtained from as many sources as possible (e.g. previous records, farmer, other veterinarians, neighbours, vector managers and local bodies) ascertain if infection is likely to be vector-related, as a result of stock movement, or from cohort infection.

These procedures should follow the investigation, reporting and review guidelines of AHB National Tb Operational Plan (NTOP). This is covered by Policy No. 14 and is found in section four of the Deer Tb VTO manual

- Find out degree and timing of vector control operations in the area.
- Ascertain what previous testing history and degree (if any) of infection over time.
- Categorise breakdown into age, sex and cohort groups if possible.
- Check grazing patterns and/or pattern of infection relating to topography of farm

- Categorise reasons for breakdown into:
 - Residual within herd infection
 - Brought in with either white tagged or other deer
 - Infected neighbouring herd
 - Infected wildlife
- These categories should be ranked:
 - most likely
 - possible
 - not likely
 - definitely not
- Track movement of cattle /deer from the herd and ensure these have been tested.
- Trace source of animals into herd and check history.

For further background epidemiological information on transmission and control of Tb in deer and cattle, reference should be made to the epidemiology section (section eight in the deer and section nine in the cattle manuals) and reference section (section ten) of the Tb VTO manuals from the NZVA Tb Testing Quality Assurance Programme.

Tb Control Planning

The major outcome required from the management meetings is to increase the testing frequency to the ideal level in the face of an outbreak. Often there are serious farm management constraints to achieving this. Methods can be suggested to help overcome this.

Breaking herd into mob or cohort groups of hinds/weaners, stags, and yearlings. Each of these groups can then be tested as separate episodes provided no group receives two tests closer than 60 days apart. The ideal is that each group receives its second test as close to six months after the first as possible (or earlier if that group is considered “at risk”), but fits around normal management procedures on the farm.

An example of this regime would be to tests hinds (mixed-age and rising yearlings) with their first test in September and the stags during velveting in October /November. The second test of hinds could then done with weaners at foot in February or at weaning in March, and the stags post roar in June /July.

It is ideal to complete the whole test within the 90-day period. However, if the completed plan provides good reason for extending this interval whilst achieving the two tests within one year, the desired outcome has still been delivered.

Cohort Testing: In some herds where numbers are very large and infection is isolated into specific cohort groups then it may be sufficient to only retest this group for the second test. However, a second clear whole herd test later than 6 months after the first is still required to attain a clear status.

Parallel and Ancillary Testing

Discussion would be needed on outcomes from the primary tests in terms of what ancillary tests (BTB, or slaughter) would be appropriate. History of non-specific reactions would also need to be taken into account. The use of parallel tests, such as the Elisa on test negative animals, should also be taken into consideration if appropriate. Cost of these options (and who would pay for them) as well as the sensitivity and specificity of each need to be considered prior to their inclusion in the management plan.

Vector Control Planning

If it is established that the chronic Tb problem is vector-related then there is a number of epidemiological tools that can be used to help maximise the effectiveness of localised vector control and minimise the potential for transmission from vector to stock.

Spatial Clustering: Recent work done by Joanna McKenzie and Carola Sauter-Louis of the EpiCentre at Massey University (1) (See elsewhere in these proceedings) has demonstrated that low density possum populations tend to spatially cluster in groups in areas that have a particular type of vegetation. These areas are known as “hotspots.”(2) The ability to predict where these groups may be on a farm allows focused control to occur. Recommendations are that:

1. Intensive and effective possum control is conducted in habitats that contain 5 or more vegetation classes as they support a higher density of possums than less heterogeneous habitat.
2. This control can be enhanced by intensifying effort within these patches in areas that have:
 - Multiple enclosed dens in trees, logs and stumps
 - A single tree with diameter greater than 80cm
 - Gorse or manuka scrub in combination with tree species
 - 2 –5 enclosed dens under ground cover.

Seasonal variation in transmission rates: Environmental stress and the breeding seasons of spring and autumn are both known to have an impact on transmission between possum groups. Control during these periods, aimed at reducing the dispersal of young male joeys, can also have a positive impact.

Indicator Species: Pigs, wild deer and ferrets can all be used as indicator species for the presence of infection. Pigs grazed in paddocks close to potential hotspots may help identify these areas.

Grazing Management of Stock

Avoidance of grazing of pasture adjacent to bush areas that are identified as likely possum habitat (especially during spring and summer) may also help reduce the likelihood of possum-deer interaction and subsequent transmission. Sheep are far less likely to contract Tb so can be used in an integrated grazing system during these periods to help manage risk.

Recording and Analysis

At the completion of the planning process it is important to record the expected outcomes and timeframes in a manner that satisfies all the participants of the group. These records should be held by the Disease Control Manager. Following the completion of the testing regime and vector control then an analysis should be done of the success of the plan. If the herd is no longer chronically infected then advice should be given to help maintain this status, with localised vector control if necessary, and farm policy on stock movement and ongoing testing.

If the herd remains with an infected status further management planning should be undertaken with modification of recommendations as required.

Once the year's programme is completed the plan needs to be revisited and analysed. Modification of particular areas may be necessary if the chronic problem persists

References

- (1) McKenzie J, Meenken D. Spatial clustering of low-density possum populations and association with habitat Animal Health Board Paper Feb 2001
- (2) Morris RS, Pfeiffer DU. Directions and issues in bovine tuberculosis epidemiology and control in New Zealand. New Zealand Veterinary Journal 43, 256-265, 1995