

## 10. TB in South American Camelids (llamas, alpacas, vicuñas, guanacos)

### Background

10.1 TB is not a major health problem of camelids, but these species do occasionally become infected and develop clinical TB. Although reports of infection in their natural habitat in South America are few, cases of TB caused by *M. bovis* have been diagnosed in llamas and alpacas in New Zealand, the USA, Holland, Ireland and Great Britain, some of them with high morbidity and severe disease. *M. avium* and *M. microti* infections have also been documented in the veterinary literature. The disease is very difficult to diagnose on clinical examination. Some authors suggest that TB should be considered in the differential diagnosis of all cases of chronic loss of condition in these species, with or without obvious respiratory signs.

### Procedures

10.2 As with other non-bovine species, there is at present little legislation underpinning the control of TB incidents in camelids in Great Britain, apart from the general power in the TB Orders to isolate and restrict movements of any affected and in-contact animals. There is no requirement to identify camelids or record their movements. DVMs or Local Authorities have no legal powers to enforce tuberculin testing of camelids and slaughter any reactors. Similarly, there are no provisions to compensate owners for the loss of such animals. Therefore, any testing of camelids for TB has to be voluntary, but if the owner does agree to test at the Department's expense (see below), then this needs to be linked to a voluntary prior agreement to release for slaughter any animals identified as reactors.

10.3 Camelids will be tuberculin skin tested at the Department's expense if:

- infection with *M. bovis* of the camelid herd itself is confirmed by bacteriological culture;
- identified as forward or back tracings from a herd with confirmed *M. bovis* infection;
- *M. bovis* infection has been confirmed in a cattle herd co-located with (or contiguous to) a camelid herd.

10.4 In the first situation described in 10.3 above (i.e. where *M. bovis* infection has been confirmed in a camelid herd), Article 18 (17 or 16, as applicable) restrictions [TR148](#) will be served and remain in place until the DVM is satisfied that the herd is free from TB. In practice, this means that the movement restrictions can only be rescinded once all infected and any test-positive animals have been slaughtered and any remaining animals have undergone two consecutive intradermal comparative tests with negative results at intervals of 90 days or more.

10.5 Alternatively, the whole herd in which *M. bovis* has been isolated may be privately slaughtered or, if the owner does not give permission to test, remain under permanent restrictions.

10.6 Where a camelid herd is co-located with an infected cattle herd on the same TB2 restricted premises and infection has not been demonstrated on the camelids themselves, Notice of restrictions TR148 should be served as a precaution but lifted once TB2 has been withdrawn from the infected cattle herd and the entire camelid herd has undergone one tuberculin test with negative results.

10.7 The CCDC should not be notified in the case of co-located camelids, unless/until *M. bovis* infection has been confirmed in the camelids, although they should already be aware that there is confirmed TB in the cattle herd anyway. The presence of camelids in itself does not materially alter the public health risks arising from the ongoing situation in the infected cattle herd.

10.8 Whenever the need has arisen in the first place to test camelids, goats (or any other livestock) located on the same premises as infected cattle, the cattle TB2 restrictions cannot be lifted unless the goats, camelids, etc. have also been TB tested with negative results, or control measures had been adopted by the owner to effectively segregate the cattle from the

untested animals on the same farm before commencement of their short-interval testing regime.

10.9 If the owner refuses to test the camelids on farm, the decision as to whether the restrictions should remain in force or be withdrawn when the TB10 is served on the cattle herd, should be taken as per DVM discretion based on the risk-assessment of the management of the two species on the affected farm, the likely source of infection for the cattle herd and the potential routes of transmission.

10.10 Co-located in this context involves occupation of the same holding as the infected cattle herd with potential for direct or indirect contact between cattle and camelids or exposure to a common source of *M. bovis* infection.

10.11 Camelid herds that are contiguous to a confirmed cattle breakdown or individual camelids/herds identified as forward/back tracings from an *M. bovis*-infected camelid herd should not, in principle, be subjected to Article 18 restrictions [TR148](#) while they await TB testing.

### Testing/Sampling

10.12 Tuberculin testing of camelids will be by the single intradermal comparative cervical tuberculin (SICCT) test in the **posterior axillary region**. Although not fully validated in camelids, the SICCT test is adequate for assessing the status of individual camelids in a herd with confirmed TB. This test provides reasonable sensitivity and specificity if meticulously performed. The SICCT is also the official testing procedure for camelids exported from the UK and has been officially adopted by the Swedish Board of Agriculture and the Swiss Federal Veterinary Office as the recommended test for TB in camelids. Intradermal tuberculin tests in the posterior axillary site are also the prescribed tests for TB in camelids in the USA (Animal and Plant Health Inspection Service, US Department of Agriculture), Argentina (SENASA – National Food Hygiene and Quality Service), New Zealand (Alpaca Association of New Zealand) and Canada (Canadian Food Inspection Agency).

10.13 To date, no alternative in vitro diagnostic methods for bovine TB have been properly validated in sufficient numbers of camelids. The recently developed Chembio Rapid Test is available at VLA on an experimental basis. This blood test is based on the detection of antibodies to a set of recombinant *M. bovis* antigens and is known to detect tuberculous animals of a range of species. Experience from badgers and cattle indicates that the Rapid Test has good specificity but a moderate sensitivity. It can be used as a **voluntary** ancillary parallel test of skin test-negative animals in camelid herds **with confirmed infection** to enhance the overall sensitivity of TB testing, ideally after the initial skin herd test. Approval for this test must be obtained in advance from Veterinary Services Manager in Policy and Planning and, if granted, blood samples are to be taken 10-30 days after a skin test. Further information can be found at: **Sample, Test & Result** > [Diagnostic Testing](#) . VLA does not offer the Rapid Test on a private basis to owners of camelids. The  $\gamma$ -IFN test (Bovigam®) for TB does not work in camelids.

10.14 Where TB testing is being carried out at the Department's expense, an ex-gratia flat payment may be available for each reactor, subject to a risk assessment by Animal Health which concludes that infection in the camelid herd poses a risk for animal and/or human health in the locality and payment would encourage the removal of potentially infected animals. Please check with the relevant VSM of Policy and Planning before committing to any payments with the owner. Once there is agreement in principle from both sides to TB test, it is advisable that Animal Health obtain the owners' written confirmation of their acceptance of an ex gratia payment for any reactors, at least before undertaking a herd test.

10.15 The SICCT test in camelids should ideally be applied by a VO. Failing that, the test, in decreasing order of preference, can be applied by:

- an OV in the deer testing panel;

- an OV with experience of testing camelids for export;
- a camelid experienced OV.

10.16 For these options a VO will need to attend and supervise at least the start of the test to ensure testing protocols are clear and for Animal Health to gain knowledge of camelids.

10.17 The protocol and interpretation that must be adopted is set out in detail see: **Sample, Test & Result > Sample & Test Techniques > [The Tuberculin Testing of Camelids](#)**.

## HEALTH AND SAFETY WARNING

Unlike cattle, camelids can spit a mixture of gastric contents and saliva. This is a potential zoonotic risk. Please take appropriate health and safety precautions (see [Chapter 46](#) for details).

10.18 Tested camelids will be considered potentially infected (reactors) if a positive reaction (i.e. >2mm increase or detectable oedema) is observed at the bovine tuberculin injection site 72 ( $\pm$  4) hours after injection and the increase in skin thickness at the bovine injection site exceeds that measured at the avian injection site. Any other animals will be considered negative. Test results should be recorded on the standard cattle test charts [TB52\(LT\)/TB52\(VI\)](#), [TB52A\(LT\)/TB52A\(VI\)](#) and submitted promptly to the DVM. If a camelid fails the skin test, the whole herd will be placed under Article 18 or 17 or 16 restrictions if not already in force. TB restrictions will remain in force until all test reactors have been slaughtered and undergone post-mortem examination.

### Further Action

10.19 Any camelids that may have moved out of an infected herd should be forward traced and tuberculin tested once at the Department's expense. It is difficult to define a time window for forward tracings in the absence of any testing history for most camelid herds. Where the infection appears to be due to the purchase of infected stock, tracing investigations should span the period since the arrival of the infected camelid(s). By contrast, where the presumed origin of the TB incident is lateral spread into camelids from local cattle or wildlife source, then the window for forward tracings will be determined by the most likely date of exposure for the diseased camelid(s), based on pathological and epidemiological findings.

10.20 Testing of any forward-traced animal should take place at least 90 days after the animal left the infected flock. The test should be read using the same interpretation as set out in the previous paragraph. If the owners refuse to allow testing of traced animals, or if there is suspicion that the traced animal could be moved prior to testing, only the traced camelid should be placed under Article 18 or 17 or 16 restrictions [TR148](#). The Notice TR148 should confine the traced animal to the premises and isolate it from other susceptible animals until slaughtered, tested clear or dead. In the absence of individual animal ID (i.e. where the current owner cannot conclusively identify which animals came from the infected herd), there may be no option but to check test the entire destination herd. Back tracing investigations and testing of the suspected herd(s) of origin of a tuberculous camelid should also be undertaken.

10.21 Consideration should also be given to testing camelid herds that are contiguous with cattle herds affected by confirmed TB breakdown, where the epidemiological investigation (DRF) reveals such herds and indicates that camelids might be a source of (or at risk of) infection. Again, this will be at the Department's expense and with the owner's agreement and understanding of the implications.

10.22 Finally, private tuberculin testing of camelid herds of unknown status at the owner's request can be permitted provided that the owner is willing to pay an OV to perform the test.

Animal Health will supply the necessary tuberculin free of charge. The OV doing the test will need to write the results up on the usual [TB52\(LT\)/TB52\(VI\)](#), [TB52A\(LT\)/TB52A\(VI\)](#) forms and send those to the DVM. Animal Health must inform the herd owner, in advance of testing, of the possible repercussions of a positive test result (e.g. herd restrictions).

10.23 The movement licence [[TR219](#)] should be used to authorise all movements direct to slaughter.

10.24 The withdrawal of restrictions notice [[TR220](#)] should be used to lift restrictions when appropriate.