

Testing for bTB in camelids

In October 2014 there were changes in tests available for herds outside of a bTB breakdown, for example surveillance and pre-movement testing, and also in the application of tests when under restrictions for bTB. The tests available are changing in September 2015 although in practice this will have no significant effect on the sensitivity or specificity of tests that have recently been offered.

Outside of a bTB breakdown.

Previously the only test available to camelid herds where bTB was not confirmed (surveillance and pre-movement) was the comparative skin test. As it is now universally accepted that the skin test is *very* poor at detecting bTB in camelids, blood tests were introduced last year to offer improved sensitivity.

To allay worries about the risk of false positives in animals not in a bTB breakdown situation, the tests offered have a trade-off between increased sensitivity (the ability to find the disease if present) and specificity (in layman's terms the risk of a false positive). This means that the chance of detecting disease in an animal if present is just over 50% - not perfect but way ahead of the skin test at perhaps 5%. Usual bio security precautions and disease status risk-assessment of the vendor herd therefore still apply to tested animals.

Blood tests are available through your vet from APHA (previously AHVLA), or from a private company, Surefarm, who offer the Enferplex test.

The APHA tests are a combination of two tests, Idexx and DPP VetTB. Both have had results of use in camelids published. The tests are used in serial interpretation, which means that the animal has to be positive on BOTH tests to be deemed positive. The private test has a different system, using one test that combines 4 'spots' to indicate disease status. Both the combined APHA tests and the 4-spot test have about the same sensitivity and specificity.

To achieve the highest sensitivity it is important to 'prime' the animal with the skin test 10 - 30 days prior to the blood test.

The APHA tests are offered as a package ref: PC0710. It costs £ 22.95 per test, or for 5 and above £19.85.

There have been many cases of bTB being brought into an otherwise healthy herd through animal movements - purchase, matings and agistment. We would argue that more herds have been infected by the introduction of infected stock than by wildlife contact. If you are introducing an alpaca into your herd, it should be automatic that you have a bTB blood test before it comes into contact with your existing stock. No reputable breeder will refuse such a test. If it moves - test it!

Tests in a bTB breakdown.

Prior to October 2014, owners could refuse to blood test their camelids and use the skin test only. In practice this meant that in many cases diseased animals were left behind to prolong the breakdown and further spread the disease within the herd or by infected animals being sold on or sent on agistment.

From October 14 it is no longer optional whether to blood test or not once restrictions are in place - it is compulsory.

To increase the sensitivity of the blood tests when used in a breakdown, two tests are combined and read in Parallel - that is, if the animal fails *either* test it is deemed as positive. This increases the sensitivity to around 80%, with some trade off against specificity - that is, the risk of a false positive slightly increases. That slightly increased risk has to be borne against the greater risk of leaving diseased animals within the herd which will also result in the deaths of more animals - it is essential to remove the disease from the herd.

Owners have a choice of two out of three tests. The three tests all have very similar sensitivity and specificity data, and in our opinion it makes little difference which two are chosen. The tests are:

Idexx, DPP VetTB, and Enferplex used in its 2-spot interpretation.

The animals will have been tested and therefore primed with the skin test prior to blood samples being taken, which is important to achieve maximum sensitivity.

Details correct September 2015. Please check with APHA at time of testing to confirm current tests and procedures.

TESTS AVAILABLE WHEN UNDER RESTRICTION

As at July 14th 2012.

The tests currently available are the comparative skin test and the Chembio Rapid Stat Pak Blood Test and in certain situations depending on the severity of the breakdown DEFRA AHVLA may offer additional blood tests or introduce measures that they deem are necessary.

The Rapid Stat-Pak blood test is optional and not all herds have chosen to use it. Some herds have chosen to come out of restriction having used only the skin test. If you are selling alpacas or offering mating services, attending shows etc please do not consider coming out of restriction having refused the Rapid Stat Pak blood test and using the skin test alone. The effectiveness of the skin test is documented in this report on tests in camelids:

http://www.alpacatb.com/SAC%20TB_DPP_RT_CVI.2011.pdf

In the executive summary of the report it states:

“Over 95% of the animals (alpacas and llamas) with evidence of TB failed to produce skin test reactions, thus confirming concerns about the validity of this method for testing SAC (South American Camelids) The findings suggest that serological assays may offer a more accurate and practical alternative for antemortem detection of camelid TB.”

The Rapid Stat Pak Test can be used at anytime, but it is Defra’s preference to conduct the test (whenever possible) in the 10 – 30 days following a tuberculin skin test in order to boost (or ‘prime’) the antibody response.

This test along with several other tests have recently been validated and details of that data can be found below. The study shows the Rapid Stat- Pak test is effective at removing 68.8 % of infected TB animals from your herd and carries the risk of 2.3% being false positives.

Explanation of the possible practical application of the blood test validation project

On May 29th this year the Camelid TB Support and Research Group together with representatives from BCL (British Camelids Ltd) BVCS (British Veterinary Camelid Society) BLS (British Llama Society) and BAS (British Alpaca Society) attended a camelid liaison meeting with AHVLA and DEFRA in Weybridge.

A presentation on the results of the validated blood tests and possible future use was given by Senior AHVLA and Defra colleagues.

We were all asked to submit our opinions on their future use both as a private test and whilst under TB restrictions. Defra policy will look at all our feedback and will make decisions based on the TB situation in Camelids and how best to control this disease in our species. We can only give our opinions and when the final decision is made by Defra we will post that decision here on our website.

Until such time - nothing has changed.

Below is a simplified summary of the bloods test that have been validated.

Sensitivity

The sensitivity of a test is the proportion of truly infected animals that are detected with a test.

For example, 90 % sensitivity means that out of 100 infected animals, 90 will be correctly identified (*true-positives*), and 10 will be missed (*false-negatives*)

Specificity

The specificity of a test is the proportion of truly uninfected animals that are correctly classified as test-negative. For example, 90 % specificity means that out of 100 truly negative animals, 90 will be test-negative (*true-negatives*) whilst 10 will test positive (*false-positives*)

The table below shows the sensitivity and specificity of the validated tests used on their own, and in combinations.

For example, using the table below which is taken from the Validation of ante-mortem tests in Camelids conducted by the AHVLA:

The Stat-pak test (usually referred to as the Rapid Stat-Pak) will find 68.8% of infected camelids in your herd but will leave behind a possible 31.2% of infected camelids. However with 97.7% specificity 2.3% may be false positives animals.

As you can see by the table the use of combination tests detects more infected camelids but the number of false positives increases.

TABLE 5: Antibody test combinations - sensitivity and specificity

	n/48 % Sensitivity [95%CI]	n/257 % Specificity [95%CI]
SINGLE TESTS		
STAT-PAK	33/48 68.8% [56.6-81]	6/257 97.7% [95.9-99.9]
DPP	29/48 60.4% [47.5-73.3]	8/257 96.9% [94.8-99]
IDEXX	34/48 70.8% [58.8-82.8]	6/257 97.7% [95.9-99.5]
ENFERplex	32/48 66.7% [53.4-80.0]	8/257 96.9% [94.8-99.0]
TEST COMBINATIONS		
STAT-PAK/IDEXX	39/48 81.3% [71-91.6]	11/257 95.8% [93.3-98.2]
STAT-PAK/ENFERplex	37/48 77.1% [65.2-89.0]	14/257 94.6% [91.8-97.4]
STAT-PAK/DPP	36/48 75.0% [63.6-86.4]	14/257 94.6% [91.8-97.4]
IDEXX/DPP	35/48 72.9% [61.1-84.6]	13/257 94.9% [92.2-97.6]
IDEXX/ENFERplex	37/48 77.1% [65.2-89.0]	12/257 95.3% [92.7-97.9]
ENFERplex/DPP	35/48 72.9% [61.1-84.6]	15/257 94.2% [91.3-97.1]
STAT-PAK/IDEXX /DPP/ENFERplex	40/48 83.3% [73.4-94.2]	25/257 90.3% [86.7-93.9]

The full blood test validation report can be found here:

http://www.alpacatb.com/120528_Updated_FINAL_REPORT_28th_MAY_2012.pdf