

Frequently asked question about bTB and Alpacas in the UK

1. What is bTB

TB is the generic term for a complex bacterial infection (which exists in many countries). The bacteria, mycobacterium bovis is common in the environment and can infect any mammal. TB is a zoonotic disease which means it can be transferred between different mammals including humans. This is why it is a 'notifiable disease'. This means if you suspect bTB you must report it to APHA.

Bovine TB (bTB), the disease caused by mycobacterium bovis is most commonly found in cattle, but it can be carried and spread by a number of other animals including Camelids, Deer, Sheep, Pigs, Goats and Badgers.

2. Can alpacas contract bTB?

Yes, alpacas can contract bTB. They can contract the disease from their herd mates, wildlife, or neighbouring cattle. The most common way of contracting bTB in an alpaca herd is by buying infected alpacas.

3. How is bTB transmitted

Spread of the disease can be via air (in aerosol form e.g. coughing, sneezing) or through ingestion of contaminated water, feed or grazing areas. Animals kept in close contact in areas with poor ventilation are at a greater risk of infecting others.

4. When are alpacas tested for bTB?

Alpacas are tested for bTB in several different scenarios.

- a. Voluntarily, usually when owners are buying or selling alpacas and also annual surveillance.

- b. Compulsorily when there is suspicion of disease or possibility of contact with infected animals.

A full explanation of when, and what, testing should be done can be found on the [BAS website](#).



5. What are my responsibilities as an owner?

You have a duty to inform APHA of suspicion of bTB

6. What responsibilities does my vet have?

Your vet has a duty to inform APHA of suspicion of bTB

7. What action can I take as an owner if I suspect bTB

You should isolate and quarantine any suspect animals following biosecurity recommendations (you can find on the BAS website).

Remember to maintain animal welfare and if there is only one animal under suspicion or ill consult your vet immediately.

Isolate as above with a companion animal until such time as appropriate testing can be carried out.

Contact anyone you have sold animals to since the introduction of the suspect animal, or if that animal has been on farm for

some time contact your buyers from the previous 6 months (minimum) to alert them to the situation.

If you have used, or provided, stud services where there could possibly be a risk of cross infection also contact the owners of those animals.

Contact BAS for help and guidance.

Place yourself into a voluntary shutdown until such time as the suspicion is dismissed or you are cleared.

Speak to your neighbours – make sure they understand the situation and the steps you are proactively taking; they may be contacted by APHA at some point as part of a risk assessment or contiguous tracing so be proactive.

You can voluntarily test all (or some of) your animals at any time before you are put under restriction by APHA and in with APHA permission you may be allowed to do so after if you make a request to test voluntarily.

Make sure you understand your options and rights for when you do get contacted by the authorities.

8. What bTB tests are used on alpacas?

There are four tests that can be used to test for bTB in alpacas in the UK.

- a. Comparative, or bovine only, skin test
- b. Enferplex blood test
- c. IDEXX blood test
- d. DPP Vet tTB

Depending on which scenario is active (outlined in Q2) certain tests can be used, or not.

9. What are sensitivity and specificity

Sensitivity – The probability that the test will detect the disease in an infected animal.

Specificity – The probability that a positive result for bTB is accurate and not another similar disease (and not a false positive).

10. How do the bTB tests work

Comparative, or bovine only, skin test

The TB skin test is the common name for the Single Intradermal Comparative Cervical Tuberculin (SICCT) test.

On **Day 1** of the test, two sites behind the elbow of the alpaca. The skin thicknesses at both sites are measured and recorded. Two types of tuberculin, one made from killed *M. bovis* and the other from killed *Mycobacterium avium*, are injected under the outer layer of the skin (i.e. into the dermis) at the 'bovine site' and the 'avian site' respectively. On **Day 4** of the test, the skin reactions to the two types of tuberculin are measured and compared. When the bovine site reaction exceeds the avian site reaction by more than 2 mm, the animal is declared a reactor under standard interpretation.

The advantage of this test lies in its excellent specificity (generally considered around 99.5%) which makes it very suitable for herd level testing. However, in camelids in particular, it suffers from very poor sensitivity, estimated at around 10-15%.

Enferplex

The test detects the presence of antibodies to bTB by use of individual antigens – antigens are parts of the Mycobacterium which generate antibodies which then bind to the antigen. There are seven different TB antigens in the Enferplex test and these are placed separately as individual spots on the surface of the test well.

A test where only a single antigen spot reacts to the presence of antibody does not mean that the animal is definitely infected. A positive reaction which indicates that the animal may be infected (inconclusive) is considered to have occurred if two individual antigen spots react to the presence of antibody.

As animals respond to more antigens the test becomes more specific until when four antigens are positive the test highly specific. If 4 or more antigens are found this is a positive test.

IDEXX blood test

The IDEXX ELISA for bovine TB (IDEXX Laboratories, Inc., Westbrook, ME) has been modified to detect camelid (not bovine) antibodies. Serum samples are diluted in kit sample diluent and then added to the ELISA plate together with plate positive and negative controls. This will result in colour formation in those wells containing specific antibodies to *M. bovis*. The reaction is stopped and the plates are read at 450 nm on an ELISA reader.

DPP VetTB

DPP VetTB lateral flow rapid antibody test to detect antibodies to *Mycobacterium bovis* in camelid serum (Chembio Diagnostic Systems, Inc., Medford, NY, USA). This test uses mycobacterial

antigens immobilised onto 2 separate lines/bands; T1 (MPB83) and T2 (ESAT6 and CFP10) on a nitrocellulose strip and a Protein A/G colloidal gold signal detection system.

For a valid test a complete line/band must appear across the “Control” window of the cassette. Test results are obtained by inserting the cassette into the Chembio Optricon Reader which measures each antigen band as reflective light units (RLU). A readout for either of the T1 or T2 antigen bands above its threshold (specificity determined by Validation) results in a positive DPPVetTB test readout.

The readouts of the two antibody tests (IDEXX and DPP VetTB) are then combined in a Serial Test interpretation for the antibody test package.

11. What is priming?

The term priming relates to the use of a tuberculin injection prior to a serological test (e.g. Enferplex) 10 to 30 days before the blood sample is taken to increase the test sensitivity.

12. Do my alpacas have to be primed for voluntary testing before sales or for herd surveillance?

In short, no. You can if you want to, but you don't have to, it is your choice. (Scenarios 1 and 2 in the document noted in Q4 above).

13. Do my alpacas have to be prime for contiguous testing?

In short, yes. Blood samples must be taken between 10 and 30 days after priming. (Scenarios 4b in the document noted in Q4 above).

14. If your herd is under suspicion of bTB what happens?

APHA will use a skin test and may offer a blood test. The blood test can be chosen by the owner (Scenarios 4a in the document noted in Q4 above).

15. What tests are required for exports?

The receiving country sets the rules so you must check with where the alpacas are going.

The EU requires an annual herd bTB test. It does not at present require an individual or group to be tested before export if the whole herd test from the previous year is clear. There are other requirements including

- a) post-mortem inspection of all slaughtered camelid animals from the establishment;
- b) post-mortem examination of fallen stock of camelid animals older than 9 months, unless impossible for logistical reasons or not necessary for scientific reasons;
- c) an annual animal health visit carried out by a veterinarian;
- d) annual testing of all camelid animals kept on the establishment for breeding purposes, with negative results using one of the EU approved testing methods shown below.

The EU does not approve the IDEXX and ENFERPLEX serology tests used in the UK. (The testing requirements are more onerous if the exporting farm has had a bTB breakdown in the past 12 months)

THE ONLY APPROVED METHODS ARE:

Tuberculin skin tests:

- (a) the single intradermal tuberculin test (SITT);
- (b) the comparative intradermal tuberculin test (CITT).

16. If my alpaca has a 2 spot enferplex test through voluntary testing what happens?

The first 2 spot result is considered inconclusive and is not reported to APHA.

You should then test again within 30 days (ideally 25 to 30 days) after the first test. If your alpaca has a second 2 spot result, then it will be reported to APHA and the individual will be under movement restriction.

The next test will be a primed Enferplex test. If the result is 4 spot or more then it is a positive, 3 or less is negative. You should request the detailed results for each antigen result so you can see how close to threshold for pass/ fail each antigen is scoring.

17. Vaccination

It has recently become legal to vaccinate alpacas (previously it was not) but procedures and processes have not yet been published.

One requirement may be a bTB test which distinguishes between a vaccinated animal and an infected animal, and this is technically possible but not yet available. It remains illegal to treat an alpaca for bTB in the UK.

There is currently no vaccine approved for use in alpacas in the UK.

18. How many herds in the UK have TB in a year?

Obviously, it varies from year to year but from the Defra statistics it averages 9 new herds per year over the last 10 years.

BAS have 1600 herds on the registry and there will be a further 800 plus that are not registered.

	New laboratory-confirmed TB incidents (breakdowns)
2011	6
2012	13
2013	8
2014	7
2015	13
2016	8
2017	11
2018	8
2019	10
2020	3

19. How many alpacas are tested for TB in a year

There are two ways of looking at this which are shown below. The number of herds tested will include all the herds that tested negative so it is NOT a guide to disease incidence.

The total tests carried out will include repeat tests on the same individual and again is not a good guide to disease incidence.

	Total herd tests (Some will be repeats of the same herd)	Total tests carried out on (some will be repeats of the same animal)
2011	36	960
2012	141	1,261
2013	79	1,275
2014	114	1,632
2015	341	4,806
2016	311	4,271
2017	393	5,873
2018	455	4,314
2019	636	10,058
2020	469	5,517