

# American Foulbrood (AFB) Testing



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ALS offers a test for American Foul Brood disease (AFB) using a modern DNA testing technique called PCR. It is not the same as conventional microbiological plating techniques, and is more sensitive allowing detection of sub-clinical levels of AFB in samples.

If the test detects AFB in a sample, then it is clear that there were AFB bacteria or spores in the sample without risk of confusion with other types of microorganisms.

The test can be used on samples such as honey, bees, brood, and even honeycomb containing honey residues. Beekeepers and honey processors can use this PCR test as a very specific and sensitive way of detecting AFB for hive management as well as market access reasons.

### AFB National Pest Management Plan

We encourage beekeepers to be familiar with their obligations under the national pest management plan, and to

consider how results received from PCR testing are to be used in accordance with it. There is a lot of valuable information about AFB and the pest management plan at [www.afb.org.nz](http://www.afb.org.nz).

### Background to AFB

(AFB) is a bacterial disease that can affect beehives with serious consequences. In New Zealand it is a notifiable disease, and is governed by a national pest management plan. Identification of hives with AFB has traditionally been carried out in two ways:

- Visual inspection of brood in hives by people who have been trained and are experienced in recognising symptoms.

- Sending samples of infected or suspicious brood, bees, or honey to a laboratory for analysis. This test involves culturing for AFB on microbiological plates, with results usually reported as negative (no AFB detected on the plate) or positive (AFB bacteria grew on the plate when cultured).

At this stage it is not possible to draw a direct comparison between results arising from a PCR test, and the results you would see from the same sample using the conventional microbiological plating technique. Nor is there data that tells us what levels of AFB bacteria or spores need to be present in samples tested by PCR for there to be clinical signs present in a hive.





### How Can the Test Be Used

**Screen honey samples for evidence of AFB**—the test can be used with honey samples collected from individual hives, or from batches of extracted honey, to confirm there is no evidence of AFB in the hives that the honey was collected from. If AFB is detected, then further investigation of the hive(s) can be carried out, and movement control of hives and beekeeping equipment can be implemented to control spread of disease.

**Testing bees, brood, and honeycomb for AFB**—if there are no visual symptoms of AFB in a hive, but the beekeeper has concern about its health, samples can be tested to check whether there are any AFB bacteria present.

**Meeting international trading requirements**—the new Overseas Market Access Requirement (OMAR) document related to honey exported from NZ to China refers to the possibility that honey imported in to China may be tested for AFB. The PCR test will provide fast and

sensitive results to processors, confirming whether there are any detectable AFB bacteria or spores in honey that may create a risk if tested in China.

### How Do I Submit a Sample?

Only 10-15 grams of sample is needed, as long as it is a good representation of the honey or hive it has been taken from. Samples should be placed in sterile, screw cap sample containers, kept cool, and sent to Analytica soon after collection.

When collecting samples, take care to avoid cross-contamination between the samples. PCR is a very sensitive testing technique, and even small amounts of cross contamination can result a ‘false

positive’ result if there are bacteria or spores present in some samples. Methylated Spirits can be used to sterilise sampling equipment to prevent spread of bacteria or spores between hives.

If you have questions about how to collect samples, please call us on +64 7 974 4740.

### Guideline for Understanding Results

Results for PCR testing are reported as a Cq value, which in itself is not very helpful for people trying to understand what they mean. The following table provides a guide as to what different Cq values mean in terms of numbers of AFB spores or bacteria in a sample:

Cq	Copies of DNA in Lab Sample Tested	Number of Bacteria or Spores per Gram of Honey
22.47	10000	178,600
26.08	1000	17,900
29.70	100	1,800
33.31	10	180
35.20	3	54