

TECHNICAL SUMMARY

Microbiological testing of honey explained

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Microbiological testing can be performed on your honey for many reasons, but the main reason is to ensure the honey has been handled hygienically from the hive to the finished product.

GB METHOD OF MICROBIOLOGICAL TESTING

The GB method of testing is the method that is performed through our sister lab CAIQTest Pacific. These tests are similar to their standard counterparts, but these methods are specifically used for Chinese market requirements, known as Guobiao Standards (GB).

This table shows the levels your honey must meet in order to get product into China:

Item	Requirements	Test methods ^a
Colony count/ (CFU/g) ≤	1000	GB 4789.2
Coliform/ (MPN/g) ≤	0.3	GB 4789.2
Mold count/ (CFU/g) ≤	200	GB 4789.15
Osmophilic yeast count/ (CFU/g) ≤	200	Annex A
Salmonella	0/25g	GB 4789.4
Shigella	0/25g	GB 4789.5
<i>Staphylococcus aureus</i>	0/25g	GB 4789.10

NB: Ensure you check the current GB Standards for China as this table may become out of date.

HYGIENE TESTING

Aerobic Plate Count (APC)

Also known as Total Plate Count (TPC) or Total Viable Count (TVC), the APC test will let you know the total number of microorganisms there are in your sample. Microorganisms are found everywhere—in the air, on the hive, on extraction/processing equipment, etc. It is good practice to test samples for APC every now and then to ensure your process is not introducing unwanted bacteria!

Yeast and mould

Yeast and mould testing is performed on honey to evaluate its risk of fermentation. Osmophilic yeasts are

yeasts that grow well in high sugar environments, so they are a higher-risk yeast to have in your honey. Mānuka honey is at a higher risk of fermentation because it is often harvested before the bees have been able to cap the honey. For those who don't know, bees cap cells when the honey reaches a low level of moisture. The lower the moisture level, the lower the risk of fermentation. What fermentation will do to your honey is change the flavour profiles and cause mould to grow. In most cases, careful consideration of your honey's moisture content will prevent yeast and mould from becoming an issue for your honey.

Total Coliforms, *E. coli* and Faecal Coliforms

TC, EC and FC are all bacterial microbes that come from the environment and can cause food poisoning. One way that these types of microbes can enter the honey is from something as simple as dropping a frame in the grass or having contaminated water in your packing/ extraction room.

Shigella, *Staphylococcus aureus*, Salmonella, Enterobacteriaceae, Listeria and *C. perfringens*

The above tests are all also bacteria that can cause food poisoning but are less likely to be in honey. Studies have shown that honey inhibits and kills these bacteria to some extent (Ibrahim, 1985). These tests are often only tested to "tick a box" when exporting honey, but you could imagine how detrimental it would be to a brand if their honey was found to have these bacteria in them.

ACTIVITY TESTING

Total Activity and Non-peroxide Activity

The total activity test is a test that will let you know the total peroxide activity

in your honey. Most fresh honey will have some level of peroxide activity. We often provide this testing on non-mānuka honey that is known to have high peroxide activity, like New Zealand's kānuka honey or Australia's jarrah honey.

The non-peroxide activity test is performed on mānuka honey as mānuka honey is the only honey to show non-peroxide activity. This test is performed by deactivating the peroxide activity so that we only see the non-peroxide activity's effects. Nowadays we work our non-peroxide activity via a calculation using dihydroxyacetone (DHA) and methylglyoxal (MG), but this test is still available and was used before the 3-in-1 test was created.

RESOLVING HIGH BACTERIA COUNTS IN YOUR HONEY

As an IANZ-accredited laboratory, ALS Analytica is not allowed to interpret or provide advice for how to use your results. What we can do is provide resources/contacts for you to use to make an informed decision.

Now that being said, there are some common ways that people have been known to treat honey with high APC, yeasts, and/or moulds. It is best to check with a local processing facility



Micro-testing. Photos supplied. continued...

as they often have their own opinion on what works best. One option is to pasteurise your honey (expose the honey to high heat). You must be careful here because heat-treating honey can cause HMF (an organic

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compound formed when certain sugars dehydrate) to rise and diastase to drop rapidly! Another option is to remove the moisture in and oxygen to the honey as both of these factors allow the microbes to continue to grow.

Different processing facilities will have different ways of treating their honey. Prevention is always the best way to keep microbes out of your honey, so remember to keep your processing and extraction facilities clean and your moisture levels low.

REFERENCE

Ibrahim, A. S. (1985). Antibacterial action of honey. *Bulletin of Islamic Medicine*, 1, 363–365.



Fermenting honey drum.



HEALTH AND SAFETY

Beekeeping in dry conditions

Although the beginning of this year has been characterised by greater than usual rainfall in much of the country, some areas are experiencing the opposite problem. If dry conditions have hit your part of the country, it is worth going over your beekeeping plan to manage fire risks.

If you haven't already, be sure to visit the Fire and Emergency New Zealand (FENZ) website to see if you require a fire permit: <https://www.firepermit.nz/fenz/Default.aspx>

It is also worth considering using alternatives to smokers in dry conditions, such as liquid smoke or bee escape boards. These basic tips from both the New Zealand and Australian fire services are a good reference:

- ensure you take a good look around apiary sites for any possible sources of ignition before you leave (FENZ recommends waiting for 15–20 minutes after finishing checks, before leaving the site)
- try to work in times of higher humidity or as cool conditions as possible, such as early morning
- ensure your smoker is in good condition and that fire or hot cinders cannot escape through the base air inlet
- light the smoker in a fireproof container. The container will contain any burning fuel that falls out of the smoker
- light the smoker in an area without flammable vegetation
- use 'cool' smoke: hot smoke is accompanied by sparks and flames and is a fire risk, add more fuel
- extinguish the smoker with one of the following methods:
 - » fill the smoker with water before emptying it, ensuring that it is completely out
 - » block the nozzle and place the smoker into an airtight fireproof container.
- emptying the smoker into water or a hole is not recommended due to the risk of embers escaping
- ensure you have a phone or other means of contacting emergency services
- carry a fire extinguisher and/or water in all vehicles
- sit the smoker on the lid of another hive rather than on the ground when not in use.

If you need to burn hives due to American foulbrood (AFB), check if you require a fire permit. If your region is under a closed fire season and you cannot be issued a permit, then contact The Management Agency to discuss your options: <https://afb.org.nz/>