



# Milk quality testing procedures

The farmer milk quality payment system is based on test results for composition and quality. Integrity of sampling, proper transport and accurate and independent testing by suitably qualified analysts are essential in building confidence that credible and robust systems operate in the dairy industry.

This fact sheet provides information on the standards and procedures used for milk quality testing in Australia.

## Equipment

Having hygienic and well calibrated equipment underpins the Australian milk quality testing system. Responsibility is shared by the farm supplier, transport operator, dairy company and laboratory.

Farm suppliers ensure the vat and vat outlet are hygienic and the vat's thermometer and volume indicators are properly calibrated.

Tanker operators only use in-line samplers approved by the National Measurement Institute (NMI) and these are routinely calibrated at least annually. They also maintain the hygiene of the tanker, tanker hoses, sampling equipment (dip and drip) and sample containers.

Dairy companies either supply NMI approved sampling equipment directly or set the standards and procedures they require through service level agreements with contracted logistics providers.

Commercial milk testing laboratories in Australia source approved analytical equipment from multinational suppliers, who supply milk testing laboratories around the world. Independent accreditation agencies such as NATA assure the calibration and use of laboratory equipment.

## Sampling

Two sample collection methods – dip and drip – are routinely used by all dairy companies. Dip and drip samples are taken at milk collection by the tanker driver for both quality and compositional (fat and protein) testing.

Tanker drivers are trained to take both dip and drip samples, though the majority of tankers are equipped with automated samplers with flow meters ensuring that a representative sample is drawn.

The procedure for taking a representative sample of milk from the farm vat is critical to the accuracy of the results and so strict procedures are followed. Key steps include ensuring hygiene of the sampling equipment and process, agitating the milk prior to sampling, accurate labeling of sample containers and keeping the milk samples cool for transport back to the factory.

Companies have individual sample identification systems but each sample is uniquely identified. The most commonly used system is bar-coding which also allows the sample to be traced to an individual farm.

## Transport

As soon as the milk samples have been collected, they are cooled on ice and transported to a collection point, usually at the company where the milk is delivered.

Dairy companies frequently use external contractors to collect and transport milk from farm to factory. The procedures for milk sampling by tanker operators are generally set through service level agreements between the dairy company and the logistics provider. National guidelines for tanker operators are established through the Milk Tanker Operator Information Kit (2020).

Milk is kept refrigerated at the collection point whilst awaiting a courier for transport to the laboratory. Couriers are scheduled to minimise delay and cater for weekend samples and remote locations.

Maximum limits on the time between sampling and analysis are applied by laboratories to ensure only milk samples arriving in good condition are tested.

## Analysis

The BVAQ Australia Milk Testing Laboratory located in Melbourne is accredited to national (NATA) and international (IDF) standards and performs raw milk testing for a large proportion of the Australian Dairy Industry. Centralisation of raw milk testing offers many advantages including national consistency, standardisation of test methods, independence of testing and personnel, cost effectiveness for the acquisition and use of contemporary instruments, and streamlined laboratory information systems, reporting of results and data analyses.

All samples received must be transported and stored between 0°C and 4°C and tested for quality analyses within 24 hours of collection, unless authorisation to extend to 48 hours has been provided by the dairy company. If they fail to meet these standards then they cannot undergo tests for some quality parameters such as thermidurics, and bactoscan. Frozen samples can be tested for inhibitory substances up to one month from the date of collection. Composition testing, for example fat and protein, can be tested beyond 48 hours provided sample integrity is not compromised. In these cases, companies have internal policies and procedures for establishing the basis for farmer payments.

The laboratory has the latest equipment that is manufactured to international (IDF) standards. There are extensive internal and external quality assurance systems in place for the testing equipment and methods.

Instruments are calibrated using a set of Reference Milk Standards that are used to test for fat, protein (true), lactose and solids non fat (SNF). These reference standards are traceable to Australian Standard (AS) test methods.

A control sample is included with every batch of 45 milk samples during analysis. If this standard is not within specification, the system alerts the analyst so that corrective action and re-testing can occur.

Reference samples for Bulk Milk Cell Counts are prepared and supplied by the Victorian Government's Ellinbank laboratory on a quarterly basis.

BVAQ Australia also participates in independent and external inter-laboratory proficiency testing programs that involves testing and reporting the results of blind samples to another accredited and independent company.

Testing is only performed by trained and competent analysts with expertise in laboratory testing techniques.

## National herd improvement organisations

There are many herd improvement organisations across Australia, some of which operate testing facilities for fat, protein, lactose and Individual Cow Cell Counts (ICCC).

Although most milk testing laboratories use similar analytical equipment and can have similar procedures, herd improvement laboratories test milk samples taken from individual cows rather than bulk samples taken from farm vats.

Samples from individual cows tend to be more variable, with milk composition and quality varying daily according to weather conditions, feed sources, reproductive status and health. Therefore it is misleading to compare the results of bulk milk testing with aggregated ICCC results.

## Reporting of results

All laboratory results are reported back to client companies electronically.

The company then provides their suppliers with results using various communication media –short message service, facsimile, print-out of period data as well as access to secure web-enabled results are available to farmers.

Companies also undertake extensive and regular trend analyses and review of individual, site and company wide data.

## Clarifying results

Although Australia's milk quality testing systems are underpinned by comprehensive procedures at each step between farm and laboratory, occasionally the results reported seem unusual.

In the case of disputed results, all companies have vendor corrective action systems operating and dispute resolution mechanisms in place for farmers.

Short-term variability in results can also raise questions about the integrity of testing. However when investigated, the variability is generally found to be caused by changes impacting the herd (diet or environment) or a breakdown in dairy hygiene or milk cooling controls on the farm.

Farmers should contact company Field Services staff to discuss any concerns.

### FOR FURTHER INFORMATION

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or call 1800 004 377.

