



## Antibiotic residue screening programs using commercial test kits

**Antibiotic residues are a potential food safety risk that must be managed appropriately at farm and manufacturer level.**

Antibiotic management must be incorporated into Victorian dairy farm and dairy manufacturers' food safety programs. One way to verify the effectiveness of the program is through an antibiotic residue screening program.

This Dairy Food Safety Note provides an overview of the minimum requirements for accurate and reliable detection of antibiotic residues in milk and dairy products using commercial test kits.

The following elements are required to be included in an antibiotic residue screening program.

### Antibiotic Broad Spectrum Screening Test

An antibiotic residue screening program must use a broad spectrum test that is approved or validated.

A broad spectrum test is one that detects a range of antibiotic classes. These antibiotic classes include: beta-lactams (also known as penicillins), cephalosporins, aminoglycosides, macrolides, tetracyclines and sulfonamides.

### Approved or Validated Test Method

Commercial test kits or methods that are approved by a recognised national or international body are acceptable. Examples of such bodies include: New South Wales Food Authority (NSWFA), AOAC International (AOAC), Association française de normalisation (AFNOR), New Zealand Food Safety Authority (NZFSA) and the United States Food and Drug Administration (FDA).

Alternatively, test methods may be validated to "AS/NZS 4659.4 – 1999: Guide to determining the equivalence of food microbiology test methods – antibiotic test methods."<sup>1</sup>

### Good Laboratory Practices

The testing procedure must be conducted according to Good Laboratory Practices. This includes the following elements:

- **Documented sampling and test method**

The sampling plan and test method must outline the procedure for how the sampling and testing is conducted. The storage conditions for the test kit and expiry dates must also be adhered to.

- **Testing at the level of greatest sensitivity**

The reading of test results must be conducted at the point in time that yields the best sensitivity of the test. For example, with the Delvotest® SP-NT the test should be read at the 'control time'.

- **Suitable test matrices**

Test kits are generally designed for use on particular types of matrices. For example, most of the commercial antibiotic residue screening test kits have been designed for use in cow's milk. Some matrices, such as goat's milk, ewe's milk, buffalo's milk, highly viscous products (eg: cream) or high fat products (eg: butter) may not be suitable to test with some kits or may require variations to the standard kit instructions in order to achieve a valid result.

Prior to using a test kit on a different matrix to that specified in the kit instructions always check with the test kit manufacturer/distributor that the kit is suitable to use on that matrix, and whether or not variations in the standard test kit instructions are necessary.



- **Record keeping**

Records must be kept of those parameters that have a critical impact on the accuracy and validity of the test result, as well as traceability. Examples of many of these important parameters include sample identification, sampling date, sample temperature, test date, test kit batch identification number, incubation time, incubation temperature, test results and details of control samples.

- **Inclusion of positive and negative controls**

A negative control is a sample that is known to be free of antibiotics and inhibitory substances. A positive control is a sample that has been spiked with a known antibiotic and a known concentration of that antibiotic. It is important that control samples are of the same type as the test sample. For example, if the test sample is cow's milk then the

## Antibiotic residue screening programs using commercial test kits

control samples need to be prepared from cow's milk. Many of the test kit distributors can now supply positive controls with the kits rather than the test kit user having to prepare them.

- **Proficiency testing**

Laboratories must participate in either a proficiency testing program or an inter-laboratory comparison program.

- **Corrective and preventative actions**

Corrective and preventative actions resulting from incorrect test results and/or poor performance must be documented and implemented.

---

### Management of positive test results

Documented procedures must be in place for the management of positive test results.

---

### Alternative Arrangements

A licensee may wish to develop and implement an alternative antibiotic residue screening program.

Alternative screening programs must be approved by Dairy Food Safety Victoria.

---

### References

1. Standards Australia (1999) 'AS/NZS 4659.4 - Guide to determining the equivalence of food microbiology test methods – antibiotic test methods.'

---

### Further information

Other Dairy Food Safety Notes on dairy food safety topics are available.

For further food safety information, please contact:

Dairy Food Safety Victoria  
[info@dairysafe.vic.gov.au](mailto:info@dairysafe.vic.gov.au)  
Tel (03) 9810 5900  
PO Box 840  
Hawthorn 3122  
[www.dairysafe.vic.gov.au](http://www.dairysafe.vic.gov.au)

This Dairy Food Safety Note has been produced in good faith by Dairy Food Safety Victoria. However Dairy Food Safety Victoria does not warrant the accuracy of the information or accept the responsibility of any loss due to reliance upon the information.