

## PRODUCT DESCRIPTION

Mastatest is a quick and easy milk-based test to identify bacteria causing mastitis in dairy cows, and for the determination of antibiotic sensitivities. Mastatest runs 24 simultaneous tests from a single milk sample. The results are determined automatically in the Mastatest Lapbox which also incubates the milk sample.

Mastatest is the easier way to test clinical mastitis milk samples on farm and reliably get mastitis test results.

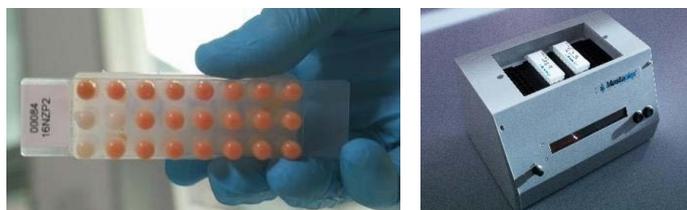
**1. Add milk sample into Mastatest cartridge, then replace lid. Firmly tap cartridge to dislodge any air bubbles.**



Mastatest cartridge with lid      Cartridge loaded with milk

**2. Place Mastatest cartridge into the Lapbox, enter cow number then start the test.**

Once the cartridge loaded with milk is placed in the Lapbox, sample incubation and analysis begins. An electronic capture device collects data for the automated colorimetric analysis. The data is continuously uploaded to the cloud. Ensure the test cartridge QR label code face down at back of Lapbox. Four tests can operate concurrently, with independent test start times.



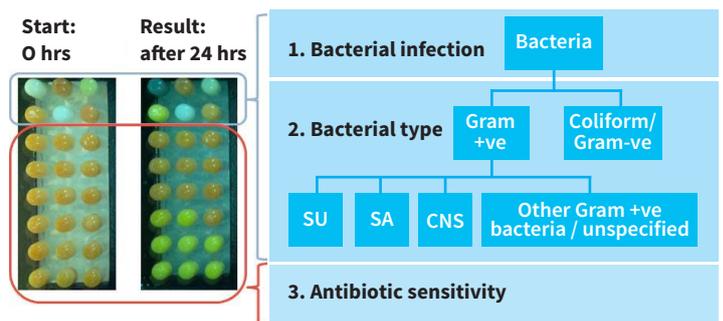
Mastatest filled with milk – ready for colourmetric analysis      Lapbox loaded with two cartridges

**3. Mastitis test results delivered by email within 24 hours.**

Once the test cycle is completed, the test results are emailed to the farmer and vet. Antibiotic treatment recommendation can be included.

The emailed test report answers three key questions that are useful to determine the best treatment for each mastitis case:

- a. Is a bacterial infection present?
- b. What bacteria type is causing the infection?
- c. Is this bacteria strain susceptible to the selected antibiotic to treat mastitis? (This is also known as antibiotic sensitivity testing).



Identifying the pathogen enables recommendation of the best antibiotic and treatment duration, and best chance of cure, in each clinical mastitis case.

Mastatest determines the antibiotic sensitivity of the mastitis causing bacteria to three commonly used antibiotic treatments for mastitis in New Zealand dairy cows:

1. Benzylpenicillin
2. Cloxacillin
3. Lincomycin + Neomycin (or Tylosin)

The data generated through the use of Mastatest is useful for monitoring and analysis of mastitis prevalence, bacterial types and antibiotic susceptibility regionally, nationally and globally.

## Product packaging

Shelf life is one year when stored in a fridge. The test is freeze dried (and therefore hygroscopic) so once the inner test bag is opened it should be used within a week.

Product	Pack size
Mastaplex Lapbox G1	each
Mastatest NZP2 (Benzylpenicillin, Cloxacillin, Lincomycin + Neomycin)	ten tests
Mastatest NZP4 (Benzylpenicillin, Cloxacillin, Tylosin)	ten tests

## MASTATEST ADVANTAGES

### FAST

results automatically arrive within 24 hours



### USE ON-FARM

samples collected and tested by farmers



### SIMPLE TO USE

set and forget the test, no interpretation required



### COMPREHENSIVE

reports bacteria type and antibiotic sensitivity



### PROVEN

clinically validated in New Zealand herds



### ELECTRONIC RECORDS

results and recommendations automatically reported to farmer and vet



## PRODUCT VALIDATION

A comprehensive clinical validation trial was undertaken by Dr Andrew Bates<sup>1</sup>. The objective was to compare the sensitivity and specificity of Mastatest with bacteria culture testing performed in an independent professional diagnostic laboratory (Cognosco, Morrinsville, Waikato, NZ). The statistical evaluation was undertaken by Massey University. The study design and protocols were approved by the Massey University Animal Ethics Committee, 16/75. The validation trial was carried out in Canterbury and Otago and included seven farms each with approximately 1,000 dairy cows.

The bacteria identification outcome from this validation study is summarised in Table 1.

n = 292 (mastitis isolates)	All pathogens		Strep uberis		Staph aureus		CNS		Coliform/gram-	
	Mean/%	SD/%	Mean/%	SD/%	Mean/%	SD/%	Mean/%	SD/%	Mean/%	SD/%
Se1 - NMC Culture	90.5	2.0	89.0	6.0	84.0	6.3	80.5	8.2	53.6	7.9
Se2 - Mastatest	94.6	1.7	87.6	6.5	85.3	5.3	80.4	8.3	76.8	7.2
Sp1 - NMC Culture	73.9	6.5	78.0	10.8	98.3	1.1	93.6	1.3	99.9	0.1
Sp2 - Mastatest	72.1	7.0	79.5	10.2	96.2	1.6	94.4	1.2	99.9	0.1

**Table 1:** Sensitivity and specificity of Mastatest compared to standard bacteria culture test (National Mastitis Council (NMC) culture).

In summary, there is no significant difference in comparative sensitivity and specificities between Mastatest and bacteria culture tests performed at accredited laboratory.

An example of antibiotic sensitivity testing results is shown in Table 2. This table summarises the antibiotic sensitivity of *Streptococcus uberis* against benzylpenicillin and cloxacillin of 65 isolates.

Strep uberis / Antibiotic (n=65)	MIC <sub>50</sub> / mg/L	MIC <sub>90</sub> / mg/L
Penicillin	<=0.05	0.1
Cloxacillin	0.5	2

**Table 2:** Antibiotic sensitivity testing through Mastatest expressed as minimum inhibitory substance concentrations: MIC<sub>50</sub> and MIC<sub>90</sub>

Overall, the clinical validation study showed that there is no statistical difference between the accredited laboratory test and the Mastatest when used on farm. Comparative antibiotic sensitivity results were also consistent with results reported in the current academic and industry literature.

<sup>1</sup>. Dairy Science Director at the Centre for Dairy Excellence and Senior Veterinarian, VetLife

## TESTIMONIALS

**Dr Andrew Bates, Dairy Science Director at the Centre for Dairy Excellence and Senior Veterinarian, VetLife**

***What is the importance, to you, of antibiotic sensitivity testing?***

As a production animal vet, antibiotic sensitivity testing is primarily of value to me when used to indicate trends in antibiotic microbial resistance and to confirm the most appropriate class of antibiotic to use. The Mastatest system allows the collection of this data from multiple clinics, regionally and nationally. This increases my ability to prescribe antimicrobials prudently and appropriately.

***What would you tell another vet considering using the Mastatest system?***

It's a rapid and simple system. Within 24 hours it can confirm whether the mastitis is due to a Staph aureus, Strep uberis, CNS staph, coliform or other strep species. The result includes the antibiotic with the lowest MIC value.

Ease of use and speed of turn-around time within the clinic means that sampling becomes a more attractive option for clients and easier for veterinary staff. Client engagement, veterinary understanding of the etiology and epidemiology of mastitis on farms and prudent stewardship of antimicrobials are all demonstrably increased.

**Josh Wheeler QCONZ - Consultant**

***What feature sold you on the Mastatest system?***

Easy to use.

No interpretation required.

Once test loaded you don't need to remember to check result at a certain time as result emailed to you.

Data kept of all results for each farmer so now better information for farmer to review their previous season performances with veterinarian.

**Ian Hodge, Veterinarian and PureMilk Consultant, Ashburton**

***What is the importance, to you, of antibiotic sensitivity testing?***

The rational and responsible use of antibiotics in food animal practice requires more knowledge of the sensitivity of bacteria to the antibiotics we have. Achieving better clinical outcomes when treating animals improves animal welfare.

***What would you tell another vet considering using the Mastatest system?***

The Mastatest system is easy to use with a quick result turnaround. The reporting system always goes through the veterinarian. The system is designed also to be used on farm where it will probably be most useful in enhancing the success of mastitis management.

**Gordon McFetridge - Farmer, Tauranga**

***How has the Mastatest system made your job easier/more efficient?***

Better understanding of what bacteria are causing our mastitis infections and the antibiotics that will work best on the infections.

Previously have tried the sending samples in for culturing and culturing myself. But Mastatest is faster, simpler and cheaper solution and provides more information.

***What feature sold you on the Mastatest system?***

Emailing of the results once completed means you don't have to remember to check that the test is finished. You put the test on and wait for the email.

***What would you tell another farmer considering using the Mastatest system?***

Very easy to use. By targeting the right treatment for each mastitis case you will get better cure rates and this has been the most benefit on our farm. We have had less cows we have treated two or three times.

