

MASTITIS EVALUATION

MASTITIS is defined as inflammation of the mammary gland. Mastitis may be caused by infection (bacterial, viral, fungal, or mixed) or by trauma. While possible in all mammalian species, mastitis affects dairy animals more commonly, with significant economic impact at the farm level based on wasted milk, wasted productive days, culled animals, and veterinary costs.

Mastitis is broadly categorised as:

1. Clinical mastitis
2. Subclinical mastitis

Clinical mastitis causes gross physical changes that are detectable on physical examination:

1. Changes in the milk:
 - a. Colour changes from white to yellow, brown, or blood-tinged.
 - b. Texture may become thick, with clumps and/or clots, or may be watery.
 - c. Smell may be foul.
2. Changes in the udder:
 - a. Cardinal signs of active inflammation (heat, pain, swelling, redness).
 - b. Udder may become cold and turn blue or black (gangrenous mastitis).
 - c. Mammary abscesses can occur with or without mastitis.
3. Changes in the animal (cow):
 - a. Clinical signs such as anorexia, pyrexia, lethargy, and/or depression.
 - b. Supramammary lymph nodes can become enlarged.
 - c. **Toxic mastitis can be fatal within 24 hours if untreated!**

Clinical mastitis is detected by assessment of the clinical history provided by the farmer, a thorough physical examination of the cow, and adequate evaluation of the milk. Milk from each quarter must be inspected, as each quarter is physically and functionally separate.



A **STRIP CUP** is used to perform appropriate organoleptic assessment of the milk. Milk is stripped from each quarter into the black mesh, which is used to evaluate the colour of the milk, and the presence of clumps or clots. The mesh is divided into four sections to ease in examining milk from each quarter. Odour is also evaluated at this time.

Strip cup. www.delaval.com

Subclinical mastitis must be considered if clinical mastitis has been ruled out. As the name suggests, the degree of inflammation is below a level that can be visually detected. Somatic cells are a normal component of milk from a healthy udder. In subclinical mastitis, there will be a considerable increase in the number of somatic cells released into the milk. Therefore an assessment of the amount of somatic cells will determine the presence or absence of subclinical mastitis.

The **CALIFORNIA MASTITIS TEST (CMT)** is a common cow-side evaluation of subclinical mastitis. The test kit comprises CMT reagent and a white CMT paddle with four compartments.

The CMT reagent has two major components:

1. A detergent (alkyl aryl sulphonate) which reacts with the DNA of the somatic cells to form a gel.
2. A pH indicator (bromo cresol purple). Acidic milk causes a yellow colour, and may be caused by bacterial fermentation. Alkaline milk is deep purple and is associated with depressed lactation.



California mastitis test kit.
<http://hoeggerfarmyard.com>

Milk from each quarter is mixed with equal amounts of CMT reagent in separate wells of the paddle. The paddle is then gently swirled horizontally to promote mixing and movement of the milk-reagent mixture. The mixture is examined both when in motion and when standing still for changes in colour and viscosity, and the degree of gel formation is used to interpret the test. A commonly used scale is provided in Table 1.

GEL FORMATION	SOMATIC CELL COUNT	RESULT
Mixture remains homogenous on standing and in motion	0 - 150,000 cells/ml	Negative
Homogenous on standing, slight gel formation when in motion	150,000 - 500,000 cells/ml	Trace
Distinct gel present when standing and when in motion	500,000 - 1,500,000 cells/ml	+
Thick gel when standing, gel begins to coalesce when in motion	1,500,000 - 5,000,000 cells/ml	++
Gel coalesces on standing, mixture will remain semi-solid in motion	Over 5,000,000 cells/ml	+++

Table 1. Interpretation of the California Mastitis Test.
 Adapted from University of Missouri Extension, 1993.

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