California Mastitis Test (CMT)

Background

Identification of cows subclinically infected with mastitis is an important part of mastitis control programs. Cows with subclinical mastitis infections do not have a swollen udders or abnormal looking milk. However because an infection is present the somatic cell count in the milk will be elevated. The California Mastitis Test (CMT) is a simple, inexpensive way of detecting unseen infections. Unlike other tests that require laboratories to interpret the results, the CMT is a cowside test that gives valuable, rapid results.

Equipment

Milk collected for CMT should be collected in a hygienic manner. Samples of milk from each quarter should be collected in a clean CMT Paddle free of any milk residue. The CMT paddle has four shallow cups marked A,B,C, and D for easy identification of the individual quarter from which the milk was obtained. The CMT solution should be properly reconstituted according to package instructions

Procedure

- About ½ teaspoon (2 cc) of milk is taken from each quarter. The is the amount that would be left in the cups when the paddle is held nearly vertical, or in an upright position.
- An equal amount of CMT reagent is added to each cup in the paddle.
- The paddle is then rotated in a circular motion to thoroughly mix the contents. The mixing should not last more than 10 seconds.
- The test must be "read" quickly because the visible reaction tends to disintegrate after about 20 seconds. The reaction is visually scored depending on the amount of gel that forms. The more gel, the higher the score.

Reading a CMT Test

- N = negative. There is no evidence of thickening in the mixture.
- T = trace. There is a slight thickening of the mixture. Trace reactions seem to disappear with a continued rotation of the paddle.
- 1= weak positive. There is a distinct thickening of the mixture, but there is no tendency to form a gel. If the paddle is rotated 20 seconds or more, the thickening may disappear.
- 2 = distinct positive. There is immediate thickening of the mixture with a slight gel formation. As the mixture is swirled, it moves toward the center of the cup, exposing the bottom of the outer edge. If the motion stops, the mixture levels out and covers the bottom of the cup.
- 3 = strong positive. A gel is formed and the surface of the mixture becomes elevated (like a fried egg). A central peak remains projected even after the paddle rotation is stopped.

Interpretation of CMT Scores

CMT scores are directly related to average somatic cell counts. The following table shows how they are related. As indicated, the somatic cell range can vary from 0 to over 5 million cells per milliliter of milk. **Any reaction of trace or above indicates that the quarter has subclinical mastitis.**

CMT Score	Somatic Cell Range	Interpretation
N (Negative)	0 – 200,000	Healthy Quarter
T (Trace)	200,000 – 400,000	Subclinical Mastitis
1	400,000 – 1,200,000	Subclinical Mastitis
2	1,200,000 – 5,000,000	Serious Mastitis Infection
3	Over 5,000,000	Serious Mastitis Infection

* Table: Jasper, D.E. 1967. Proc. Of National Mastitis Council (adapted)

Advantages of the CMT

- The CMT is fairly accurate in measuring the somatic cell concentration in milk and correlates well with other tests.
- It is sensitive.
- It is inexpensive.
- The test is simple and requires little equipment.
- The paddle is easy to clean up – simply rinse with water.

Disadvantages of the CMT

- Test scores may vary between individuals performing the test.
- Scores represent a range of somatic cells present rather than an exact count.
- Cows fresh less than 10 days or cows that are nearly dry may produce a false positive reaction. Cows should be tested closer to the middle of their lactation.
- Occasionally, acute clinical mastitis milk will not score positive if the somatic cells have been destroyed by toxins from the infecting organism.