Testing Small Ruminants for Mastitis using the California Mastitis Test (CMT)

Mastitis can become a costly health problem for small ruminant producers, thus proactive testing may help reduce treatment and management costs.

There are two types of mastitis, clinical and subclinical. Clinical can be visually recognized while subclinical is the most common but not as easy to identify. To determine if a small ruminant may have mastitis, a California Mastitis Test (CMT) can be conducted.

The CMT is a simple to use and relatively inexpensive test, allowing small ruminant producers to quickly know if their animal(s) have mastitis. When an infection occurs, white blood cells increase to help fight and stop the spread of infection. The CMT reagent reacts with milk containing high levels of white blood cells (i.e., somatic cells) to form a gel. The greater the number of white blood cells present, the thicker and more gel-like the final solution will be. It is important to keep in mind that the milk of fresh and late lactation small ruminants can react to the CMT and form a gel even in the absence of subclinical mastitis, thus the results during these specific phases of the lactation cycle may not always be reliable. In cases of a positive CMT, it is recommended that additional laboratory tests are done to determine which organisms are causing the infection. Below are the steps to follow using CMT on small ruminants.

**CMT Supplies**

- CMT Paddle
- CMT Solution
STEP 1.

Milk samples from each quarter are collected in a clean CMT paddle. Be sure to discard the first stream of milk, then fill each cup with milk. You can tilt the paddle to discard excess milk until equal volumes remain in each well.

STEP 2.

Slowly add an equal amount of CMT solution to each well in the paddle. One method is to tilt paddle back until milk is halfway between the inner and outer circles.

STEP 3.

Gently swirl the CMT paddle in a circular motion to homogenize the solution.
STEP 4.

Results can be observed within 10 seconds.

STEP 5.

Remember to always rinse the CMT paddle after each test.

Reading and Interpreting Results

Results can be interpreted differently based on the individual tester. Producers should familiarize themselves with what a negative or positive CMT result looks like. If somatic cells are present, the solution will thicken to form a gel. It is important to record the results and contact a veterinarian if CMT results are positive. Refer to the table below to interpret the results.
<table>
<thead>
<tr>
<th>Rating</th>
<th>Reaction</th>
<th>Description of Visible Reaction</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>Negative</td>
<td>Mixture remains liquid and smooth. Perfectly clean</td>
<td>0-200,000 cells/mL</td>
</tr>
<tr>
<td>T</td>
<td>Trace</td>
<td>A light slime forms and is seen most easily by tipping the paddle back and forth and observing the mixture as it flows over the bottom of the cup. There is a distorted reflection in the bottom of the paddle. Trace reaction tends to disappear quickly with continued movement of the fluid</td>
<td>150,000-500,000 cells/mL</td>
</tr>
<tr>
<td>1</td>
<td>Weak</td>
<td>Numerous distinct clumps appear but with no tendency toward a single gel mass. With some milk, the reaction is reversible and may disappear with continued movement of the paddle</td>
<td>400,000-1,500,000 cells/mL</td>
</tr>
<tr>
<td>2</td>
<td>Distinct Positive</td>
<td>The mixture thickens immediately with gel formation. As the mixture is swirled, it tends to move as a mass around the periphery of the cup forming a tail. When you tip the paddle, you can break the stream of liquid as it pours over the edge</td>
<td>800,000-5,000,000 cells/mL</td>
</tr>
<tr>
<td>3</td>
<td>Strong Positive</td>
<td>A gel is formed which causes the surface of the mixture to become convex. An egg like appearance. This central peak may adhere to the bottom of the cup. When you tip the paddle, you cannot break the stream of liquid as it pours over the edge of the cup; it all comes out as one mass.</td>
<td>Cell number greatly over 5,000,000 cells/mL</td>
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