On-Farm Culture: The Smart Approach to Clinical Mastitis Treatment

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Does every cow with mastitis need treated? Have you ever wondered if the treatment you are giving is effectively curing the case of clinical mastitis? What if her immune system has already cleared the infection? On-farm culturing allows for more informed decisions to be made regarding treatment and can help answer questions about whether to treat a quarter or not.

Mastitis is associated with the most frequent antibiotic use in dairy cows. One study found that the cost of treatment and discarded milk associated with clinical mastitis could exceed $350 per cow per year. Antibiotics are frequently used to treat clinical mastitis, however often antibiotics are either ineffective or not needed to treat the

disease. Producers that use unnecessary antibiotics will lose profit and run the risk of developing antibiotic resistance on their farm.

Identifying the species of bacteria responsible for causing a mastitis infection can be beneficial in determining treatment options and reducing unnecessary antibiotic use. Management strategies can be changed to help prevent specific pathogen types in a herd. *Staphylococcus aureus* is an example of a pathogen that is transmitted through the parlor during milking. Wearing gloves, teat dipping, and milking infected cows last are some of the ways this pathogen can be prevented and controlled. Identifying the pathogen on a farm can help producers change management strategies to prevent additional cows from being infected. On-farm culture may also help a producer decide not to treat a cow. Results in one study found 10 to 40% of cultures from clinical mastitis showed no growth following culturing. Cultures that show no bacterial growth usually require no treatment because the immune system has already cleared the bacterial infection.
Traditionally, producers send milk samples into local laboratories for culture results. One downfall of laboratory testing is the time from milk submission until results are in a producers' hands can take several days. This time lag associated with laboratory results contributes to producers making uneducated treatment decisions. Implementation of an on-farm culture program can help producers make proactive treatment decisions in a timelier manner. Submitting a sample for bacteriological culture can also be costly for a producer. On-farm culturing is often more cost-effective than obtaining laboratory results.

So how do you get started with an on-farm culture program? Penn State University has created a quad plate culturing system for dairy producers. Each quadrant of the plate can selectively grow different species of bacteria. Quadrant I MacConkey's Agar (MAC) detects Gram-negative bacteria such as coliforms and non-coliforms. Quadrant II is Edwards Modified Agar (EMCO) and detects Streptococci bacteria. Quadrant III is Baird Parker Agar (BPA) which detects Staphylococci bacteria. Finally, quadrant IIII is Blood Agar (BA) capable of growing most types of bacteria and is used to confirm the results of other quadrants.

In order for a producer to get started culturing they will need the following supplies: sterile test tubes to collect aseptic milk samples, sterile swabs to plate milk onto agar plates, agar plates to grow bacteria, and an incubator that remains at a constant temperature to grow bacteria. Once a milk sample is aseptically taken it should be plated onto a quad plate. Plates should be incubated for 24 hours and then observed for preliminary bacterial growth, an additional 24 hours of incubation may be needed to collect final results. Penn State has also created a free user guide which can help producers identify bacterial growth on their plates. Farm personnel handling on-farm culture responsibilities should consult with their herd veterinarian in order to make appropriate treatment decisions for their herd based on culture results.

On-farm culture cannot identify every mastitis-causing bacterium on your farm. For example, *Mycoplasma bovis* is a microorganism that requires special media and conditions to grow, which can only be done in laboratories. On-farm culture is

designed to help producers make more proactive treatment decisions regarding mastitis. Producers will be able to identify cows with no bacterial growth; these cows have self-cured the bacterial infection. Producers will also be able to identify Gram-negative pathogens which are often self-limiting or unresponsive to treatment, or Gram-positive pathogens which generally respond more effectively to antibiotic treatment, although some are not susceptible to antibiotics. To make a treatment decision udder health history of the cow should be examined and a consultation with a veterinarian should be set up to implement a treatment protocol.

The Penn State Extension Dairy Team recently released an online course titled "On-Farm Milk Culturing for Mastitis Control" for more information about milk culturing or the online course please contact Amber Yutzy at anl113@psu.edu.

References

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