

# Mastitis diagnostics: How to get started

Andrew Lefeld, DVM  
Maria Stein Animal Clinic  
Maria Stein, OH 45860

## Abstract

As new graduates, we are all trying to find our “place” in the veterinary world. I will discuss how I found my niche within the practice and have watched it grow over the last several years. For me, it started as a particular interest that expanded to be a good revenue generator for the practice, and a way for me to learn more about dairy practice and help clients with milk quality. I will also discuss considerations for starting your own in-clinic lab, as well as considerations for on-farm culture.

**Key words:** mastitis diagnostics, in-clinic lab, milk culture

## Introduction

During veterinary school, I had no particular interest in milk quality and parlor management. I certainly took courses, but it was not a major focus of my studies. After getting my feet wet in practice, feeling more confident, I started taking an interest in milking management and parlor management. I helped out on a few NMC parlor evaluations with another veterinarian at the practice, and wanted more. I attended the AABP Milk Quality preconference seminar in 2016. From there, I began offering more services to clients in this realm. As part of the workup, we usually include a bulk tank culture in reviewing farm practices. Sure enough, we began finding a fair bit of *Mycoplasma*. We started sending a couple hundred samples per week to other labs for testing.

Eventually, I decided we could probably try this in-house as both a service to our clients (no shipping) and revenue generation for the practice. We had been doing aerobic cultures even before I got started, but not anything close to the number we were sending out weekly. I came up with a partial budget with the closest numbers that I could, including labor, incubator and plate costs. The numbers I used for volume of samples was about what we had been sending out weekly at that point, plus some buffer for expansion. I attended training to become familiar with the organisms and come up with our diagnostic tree. For a while, we continued to send out samples plated in our lab for *Mycoplasma* culture – just as a confirmation to double-check our work. I did not feel 100% confident at that time our accuracy of finding *Mycoplasma*. I communicated with clients how we were going to handle this, and I had no pushback from them as to how we were handling it.

Mastitis/milk culture has a lot of applicability to dairy practice. If this is something you do not have a lot of experience with, I would not suggest trying to do bulk tank cultures from the start. We first started just doing individual cow cultures. As we became better at individual organism ID, we expanded to quantifications, and then began doing bulk tank cultures. Each step definitely gets more complicated, so be comfortable with the first before you try the next.

## Getting started on your own

If you have an interest in getting involved in mastitis diagnostics, there are some bigger decisions that you need to make first: what platform are you going to use? PCR? Culture? The diagnostic options all have their advantages and disadvantages. We ultimately

went with traditional culture for our lab. What secondary tests are you going to use? You can get to generic *Strep* spp. pretty easily; is that good enough? Do you want to get into the weeds (or under the hood) and break it down to *Strep uberis*, *Lactococcus* and *Enterococcus*? You'll need additional tests to get that far. You just need to decide if it matters or not and will it change where you look or what to do. *Staph aureus* diagnostics can be funny too, not all *S. aureus* is coagulase positive, and not all *S. aureus* is beta hemolytic.

Culture plate options are vast as well and consideration should be taken as to what type you'd like to use in your lab. Non-selective plates (most commonly used include blood plates) offer the advantage of non-specific growth of organisms for further workup with secondary tests, and will require a skilled reader. Selective agars have the advantage of inhibiting growth of non-target organisms (such as MacConkey), while allowing growth of specific organisms of interest. A further test that can be incorporated into agar to help distinguish organisms is the use of chromogenic tests that allow faster identification of organisms. These special plates come at a price, however. Chromogenic and selective agars are more expensive, but can allow for easier interpretation of initial culture. Use of these selective agars does commonly require the use of more space.

I really encourage that if you plan on doing consulting in milk quality and mastitis diagnostics, you should attend training in this area. I thought I understood the identification of common organisms in school, but it gets a lot different when you need to identify them on culture plates. If you incorporate a milk culture lab in your practice, you should send your lab technicians to training as well.

On-farm culture is still being used today, and can be a source of consultation for a new graduate as well. Similar to questions posed before, what questions is the farm trying to answer? Simple treat/no treat? Or do they want to break it down to *Strep/Staph/E.coli/Klebsiella*? Both are possible. Many different plate types exist to help easily differentiate organisms; simple systems also exist to make simple decisions. Each has a different cost. A key to helping systems like this work is setting them up with training from the start. Go through the entire process with them. Bring them unknowns and have them send pictures to you with their results. Most of our farms that do on-farm culture have weekly herd checks. Plates can be saved and checked by the veterinarian who is there. Questionable samples can be brought back to the clinic for further workup/culture. Continual coaching and evaluation is key to making systems like this work. Keys are figuring out what system can work for a particular farm, what skill sets they do have, what hiccups may happen. If a farm utilizes on-farm culture, the veterinarian should be aware of major pathogens on the farm. If a farm has a problem with “specialty” organisms (*Mycoplasma*, *Prototheca*) that can be difficult to identify, consideration needs to be taken as to if additional tests should be done with on-farm organisms, or samples used on the dairy should be submitted to an additional lab for testing.

---

## Conclusion

The dairy industry is very complex. Everyday veterinary practice is just a small part of it. As you get out into practice, you'll find that there are areas that you have a special interest in. Pursue these areas. It can be a springboard to be more involved on your clients' operations and be an even better resource for them. For me, it's a way to be more involved that just having your arm in a cow.

