**Major Mastitis Pathogen Isolation and Treatment Guidelines**

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Over the years, many methods of milk culturing have been employed to provide information on mastitis prevention, treatment and control. In general, these efforts have centered on culturing in a laboratory located at a university, milk processor, or veterinary clinic. By the time culture results of clinical infections are reported back from laboratories to the dairy, too much time has elapsed to be of value for treatment decisions. The attached slide presentation was designed to help personnel in small laboratories in veterinary hospitals or on farms make appropriate diagnosis of mastitis causing bacteria that can help direct mastitis treatment decisions.

I would like to re-emphasize a couple points made in this presentation and provide you with an on-farm protocol to use in this type of treatment/control program. The person(s) responsible for on-farm culturing must be interested and have enough of a background for training. It is most useful if it is the same person who is responsible for treating clinical cases of mastitis. On-farm culture is often perceived as the way to treat and clinical cases, however once the procedure has been established, subclinical mastitis cases can be managed in a similar fashion. Culturing cows with high somatic cell counts or infections at calving can utilize the same diagnostic information for making treatment and control decisions. Knowing when not to treat can be as valuable as knowing who to treat.

On-farm milk culturing can be a viable and useful tool for improving treatment protocols and overall milk quality. The success or failure of these programs is highly dependent upon the motivations, training and support of the personnel involved in this activity. The materials necessary are easily obtained, economical, and reasonably straightforward to use with proper training. Information derived from culturing is valuable for its timeliness in identification and treatment of mastitis pathogens, as well as its usefulness in the development of control strategies. Overall success is a function of the commitment and motivation of the personnel in charge of culturing.

I have included excerpts from our Mastitis Pathogen Isolation and Treatment Guidelines that shows some of the procedures discussed in this presentation. A complete guideline, protocol for on-farm milk culturing with color photos and sources of supplies can be found in the “Major Mastitis Pathogen Isolation and Treatment Guideline” (brochure) or at [www.cvm.msu.edu/~sears/isolation.htm](http://www.cvm.msu.edu/~sears/isolation.htm) .

# On-farm milk sampling and culture procedures

Milk samples must be taken using aseptic technique and placed on ice or refrigerated immediately. Contaminated samples or mishandling of the sample can lead to misdiagnosis and confusion.

**Sample consideration:**

Individual: Composite samples used to screen herd for infected cows.

Quarter samples when evaluating individual or clinical cows.

Bulk Tank: Screen herds for contagious mastitis (*Strep ag, Staph aureus, Mycoplasma*)

Sampling:Clean teats (predip and dry) before sampling.

Clean teat end with 70% alcohol using cotton balls, pledgets or wipes.

Teats must be dry before collection sample. Use a tight sealing vial or tube.

Discard first milk and collect (45o angle) into a sterile vial or tube (5 to 10 ml).

Store sample on ice or refrigerate until plating. (Freeze, if greater than 48 hours).

**Plating Selective Agar:**

Plate milk sample as soon after collecting as possible. Fresh is best.

Single plate media (blood agar plates) can be quartered for a cow or half for composites.

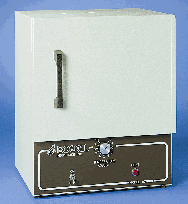
Selective agar bi-plate (Blood agar and MacConkey agar): plate clinical quarter per plate.

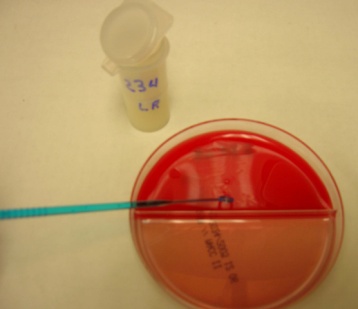
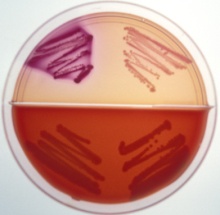
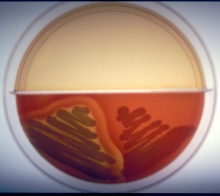
Read selective media first:

• MacConkey agar selective for coliforms

• Blood agar will grow all organisms

Gram Stain and other tests are helpful in identifying organisms.





**Laboratory**

**Supplies**

**Milk Culture Procedures**

Gram-positive

infection

Gram-negative

infection

37o C

Incubator

Loops

Bi-plate

Identify the

infection

Incubate plate

for 18-24 hours

Streak milk onto

agar bi-plate

Collect mastitis

milk sample

\* Spectramast is available and may prevent chronic IMI \*NSAID - **Non-steroidal anti-inflammatory drugs**

**Monitor**

**Fever**

**NSAID, if**

**No Antibiotics**

**No Growth**

**Monitor**

**Fever**

**NSAID, if**

**No Antibiotics**

**Coliform**

**antibiotic**

**therapy**

**Intramammary**

**Envir Strep**

**Evaluate Cow**

**1. Return to milk**

**2. Eliminate quarter**

**3. Cull cow**

**2. Monitor**

**1. Await Culture**

**Mastitis Pen**

**3. Monitor**

**2. Oral Fluids**

**1. NSAID**

**Boxstall**

**CNS**

**Staph**

**Intramammary**

**antibiotics**

**Flag records**

**Fever**

***Strep***

***Ag***

**Intramammary**

**antibiotic**

**Treat all 4**

**qrts**

**Flag records**

***Staph aureus***

**Intramammary**

**antibiotics**

**Flag records**

**Cull?**

**No Fever**

**Physical**

**Exam**

**Culture**

**Cow**

**Mastitis**

**Clinical**

**Strep spp: Susceptibility testing**

Identify new cases:

Intramammary antibiotics

(Systemic antibiotic - IM)

**Sick:**

No antibiotic IMM (low cfu)

IMM antibiotic\* (high cfu)

NSAID & fluids as needed

**Sick: (fever, dehydrated)**

NSAID – Banamine, etc

(Non-steroidal anti-inflammatory drugs)

fluids (IV or Oral)

**Staph aureus: Susceptibility testing**

**New cases:** heifers and early infections

Intramammary antibiotics → **Segregrate**

Extended therapy (3 to 8 days treatment)

Systemic antibiotic (IM)

**Chronic IMI:** non-responsive to antibiotics → **Cull**

**Staph spp: Susceptibility testing**

**New cases:** heifers and early infections

**Intramammary antibiotics**

Extended therapy (3 to 8 days treatment)

Systemic antibiotic (IM)

**Clinical Mastitis**

**Pathogen**

**Treatment based on symptom and culture isolation**

**Not Sick:**

No antibiotics (IMM)

**Not Sick:**

No antibiotic IMM (low cfu)

IMM antibiotic\* (high cfu)

**Strep agalactiae**

Strep ag is a herd problem and should be eliminated from the herd. Culture & treat all positive cows.

**therapy**

**antibiotic**

**Intramammary**

**Strep spp**

**No Growth**

**Monitor**

**Fever**

**NSAID, if**

**No Antibiotics**

**Clinical Mastitis Therapy - Guidelines**

**Staph spp**

**Intramammary**

**antibiotics**

**Flag records**

**Coliform**

**No Antibiotics**

**NSAID, if**

**Fever**

**Monitor**