



U S E R G U I D E



FERA

Diagnostics and Biologicals

ABOUT US:

FERA Diagnostics and Biologicals combines innovation and science to bring practical products to the animal health field that will enhance the health, productivity and welfare of pets and production animals.

We are a young and highly energetic research-driven company. Our growing, scientifically-proven product portfolio is designed to improve animal health, create value and contribute to the success of our customers.

FERA Animal Health, LLC was founded in 2014 by Dr. Rodrigo Bicalho, and named in honor of his two sons. The company's first product, an early version of AccuMast®, was developed in response to a large demand from Central New York dairy farms for a new mastitis testing methodology.

In February 2018, FERA Animal Health, LLC was restructured and rename FERA Diagnostics and Biologicals to reflect our growth and future plans.

AccuMast, is an on-farm mastitis culture system, that uses color to diagnose mastitis cases just 16 hours after detection. With AccuMast, the goals of selective therapy are finally achievable – saving you time and money, while improving the health of your cows and quality of the milk you ship.

LABORATORY SET UP

On-Farm Laboratory Area.

A counter or horizontal work surface that can be easily disinfected and kept free of clutter is needed to set up your incubator and culture plating space in a dedicated area for your on-farm laboratory. Avoid places that exhibit large fluctuations in room temperature and are not free of drafts. This area should always be kept clean in order to minimize the risk of contamination of the culture plates, which may result in false positive or influence the accuracy of your results.

Workers should always wear new, clean disposable gloves when working with mastitis samples or culture plates and wash their hands when the work is completed.

Incubator Setup and Operation.

The environment inside an incubator is controlled for warmth and moisture.

The goal is to provide a controlled environment that allows bacteria to grow and multiply, therefore your incubator must maintain its temperature at 37°C (98.6°F). Please keep an easy-to-read thermometer inside your incubator to allow you to monitor that your incubator is working properly. It is critical to verify if the door of the incubator is well closed and latched at all times.

The humidity inside the incubator should be about 50%. As a rule of thumb, keep 1/2 cup of water in the middle reservoir in the bottom of the incubator. Add water as needed to keep level 1/2 full. Add warm tap water. Without the proper temperature and humidity in your incubator, disease causing bacteria may fail to grow in your samples, leading to a false negative result of "No growth". Temperature and water level in the incubator should be checked daily.

Note: if you are not culturing plates everyday do not turn the incubator off. Leave the incubator on at all times so the temperature inside the incubator maintains fairly constant.

RECORD KEEPING:

Complete and accurate records are an essential component for any laboratory. We recommend a written log book be kept at the incubator. At a minimum you should record the Sample Date, Cow ID, Affected Quarter, and the final Culture Result. You may wish to capture additional information that will help you with quality control in your on-farm laboratory.

Culture results may also be entered in your computer records system (such as DairyComp 305) to help you monitor what organisms are causing mastitis on your dairy, and analyze treatment success or failure. Your veterinarian can help you design a consistent scheme for recording culture results.

SUPPLIES:

Disposable gloves. Sterile 2-ounces leakproof tube or vial for general collection and transportation of samples. Milk sample vials are sterile until opened, and should remain closed until the milk sample is collected.

Alcohol pads or cotton ball soaked in 70% alcohol. Racks for holding sample vials. Waterproof marking pen.

Disinfectant for cleaning teats. Paper or clean cloth towels. Surface disinfectant. Sterile disposable cotton tipped swabs. Sterile disposable cotton tipped swabs should be in a clean dry place. Their packing should not be opened until you are ready to plate a sample. Open the packaging at the wooden stick end so that when you remove a swab from the packing you do not touch the cotton-tipped end. Unused swabs should be kept in the original packaging.

Unused media plates should be stored upside down (lid side down) in the refrigerator. Media should not be used if the expiration date has passed. Do not freeze the media plates.

Used plates, swabs, milk samples and vials should be disposed of properly. Please watch our Demo video (Diagnosis of bovine mastitis- from laboratory to farm) at feraah.com for more details.

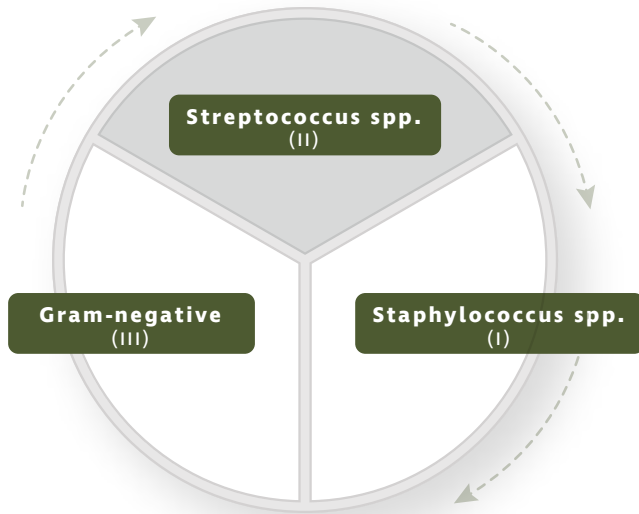
INSTRUCTIONS:

The unique and proprietary media formulated and manufacturing process are one of a kind. The media is formulated for rapid growth (fastest in the market) and also for high accuracy and easy interpretability.

Our proprietary chromogenic system is linked to both biochemical tests and to markers specific to the footprint of each organism to provide a multi-layered, high accuracy system. Accumast plus takes the subjectivity as well as the time out of interpreting microbiology, making it possible for the first time to bring these diagnostics back in-house without sacrificing accuracy or simplicity.

ACCUMAST MEDIA

The Accumast tests use a three-section plate system, enabling veterinarians, farmers and herd managers to accurately diagnose almost all commonly encountered infections faster.



Gram-negative:

E.coli; Klebsiella; Pseudomonas

Streptococcus spp:

Streptococcus spp. Enterococcus spp.
Lactococcus spp.

Staphylococcus spp:

Coagulase negative Staphylococcus;
Staphylococcus aureus

STORAGE:

Accumast may be shipped and stored for brief periods at room temperature.

Upon receipt store at 2-8°C. Away from direct light. Media should not be used if there are any signs of deterioration (shrinking, cracking, or discoloration), contamination, or if the expiration date has passed. Product is light and temperature sensitive; protect from light, excessive heat, moisture and freezing.

It is recommended Accumast to be refrigerated once the pack is open. Expiration is 6 months from the date of manufacturer. It can last up to 8 months if kept protected from light, contamination and dehydration

MAKING THE CULTURE:

Dip a swab cotton tipped or loop into your milk sample. If needed, tap excess moisture/debris off on the side of your vial. Use a side to side motion to lightly streak onto the surface of first section of the plate, covering the entire media. Re-dip the swab into the sample and repeat for each of the next sections, dipping into your sample between each. Label the plates with the cow info on the bottom and place upside down (on lid) into incubator at 37°C.

All bacterial organisms will grow within 16 hours, although in many cases the causative organism can be identified in as little as 8-10 hours.

HOW TO READ

When reading the plate, always place the white media at the top.
Hold the plate facing the surface of the agar - lid side up.

IMPORTANT:

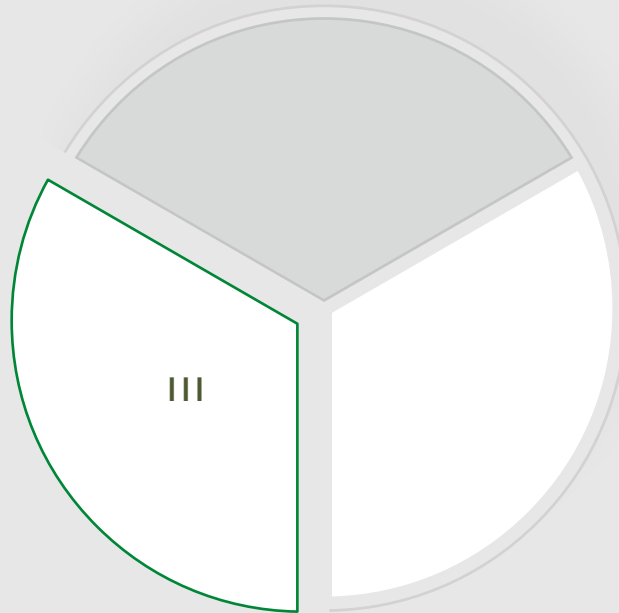
Remember that the Gram-negative medium is labeled # III on the underside of the plate.

A dark-colored cow with a yellow ear tag is shown in profile, looking down at the ground. The background is a blurred barn interior with other cows. The overall lighting is dim and moody.

INTERPRETING

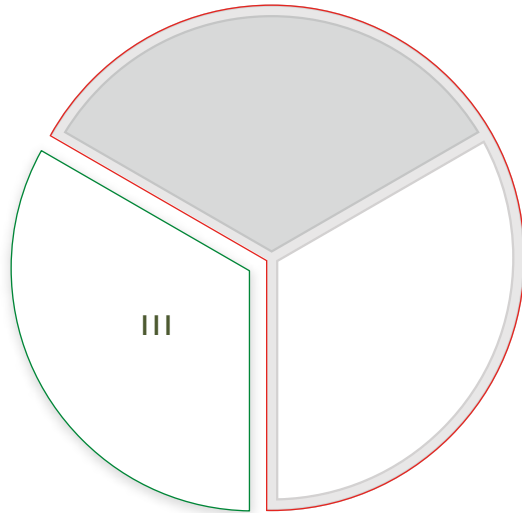
THE RESULTS

GRAM-NEGATIVE



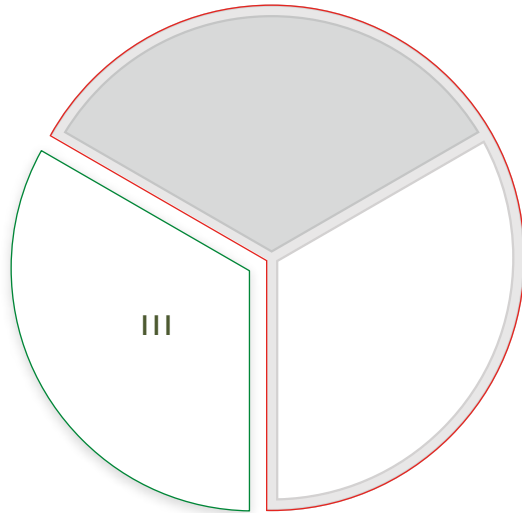
E. COLI

Pink



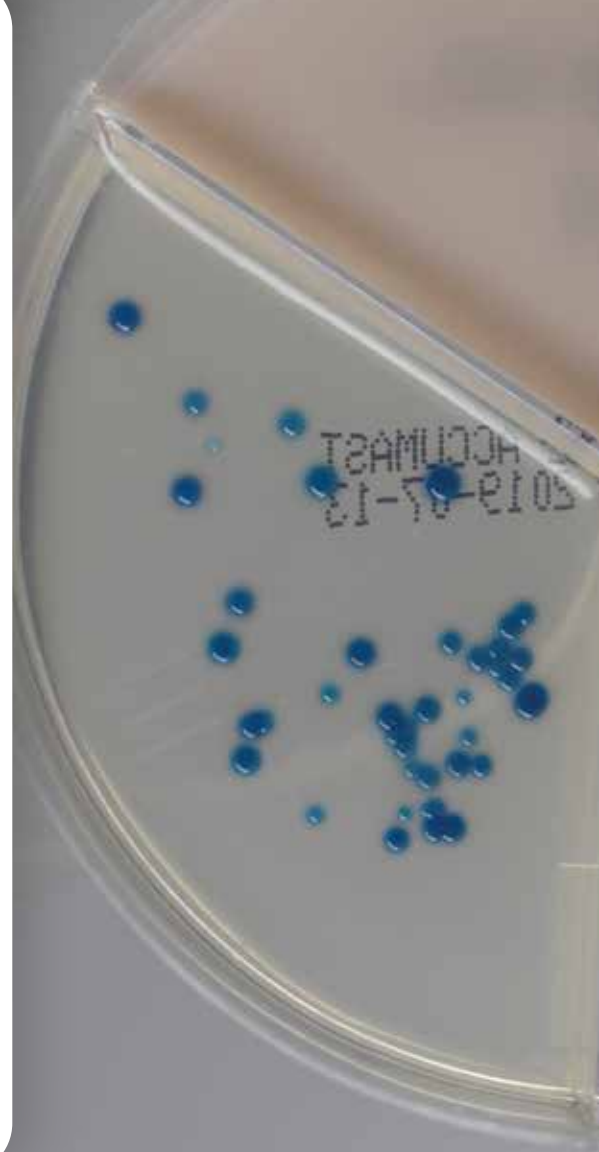
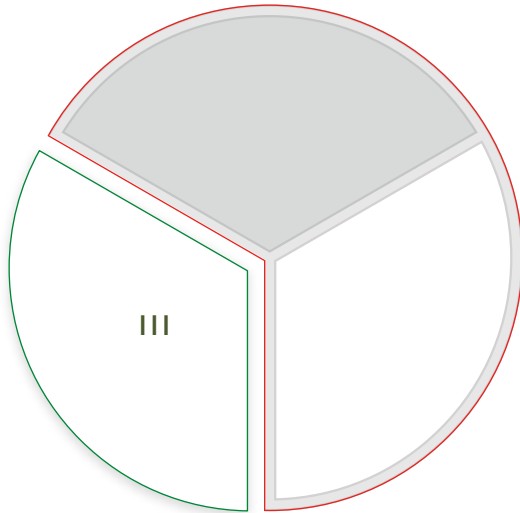
PSEUDOMONAS

White colonies with yellow media



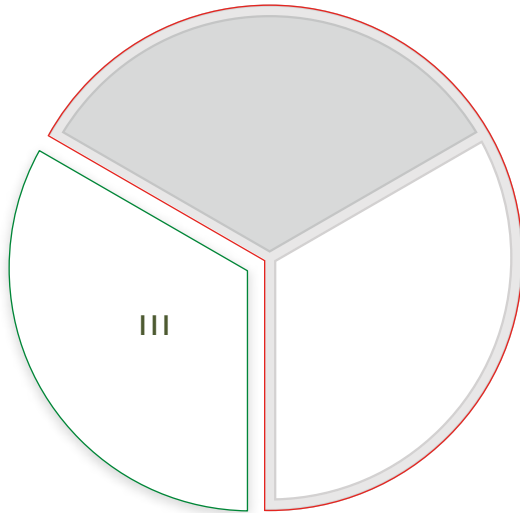
KLEBSIELLA SPP.

Blue

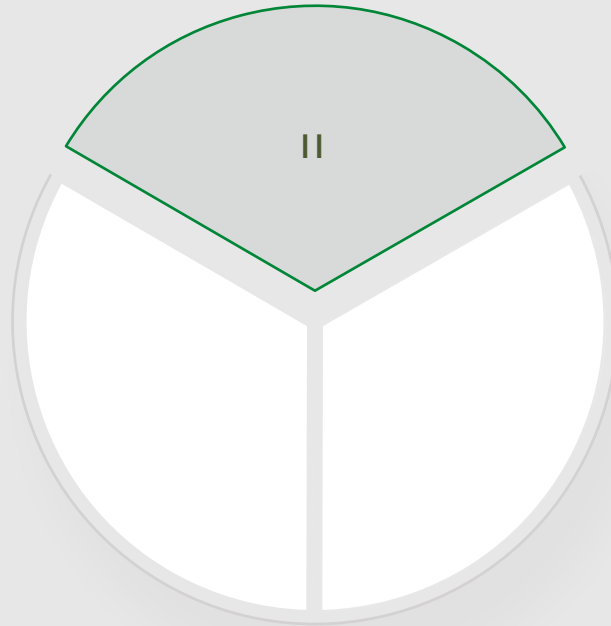


ENTEROBACTER

Purple

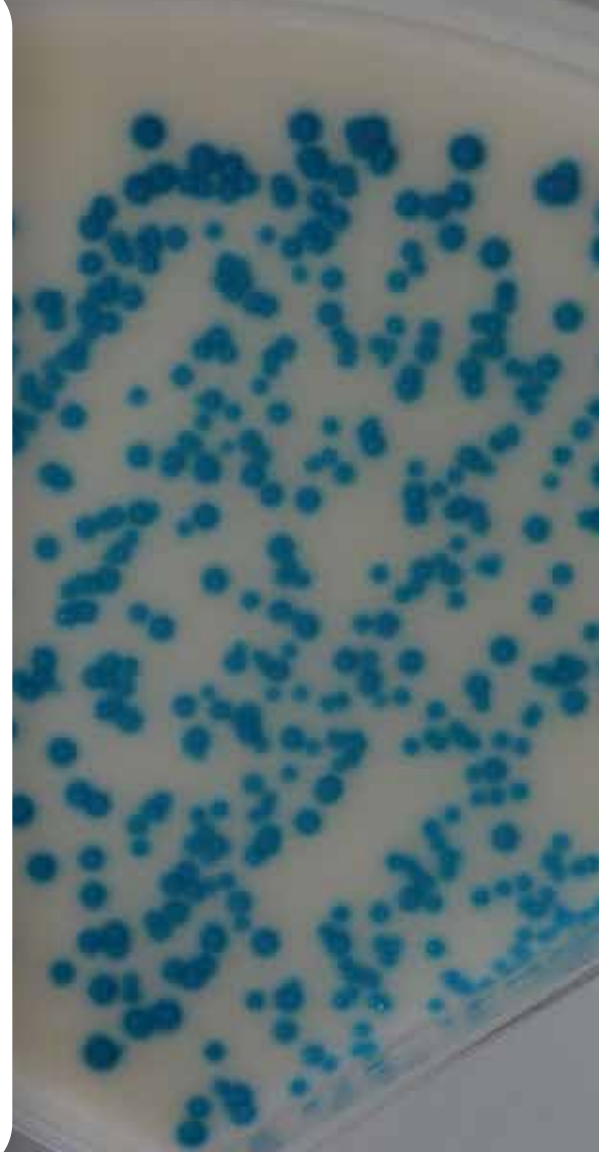
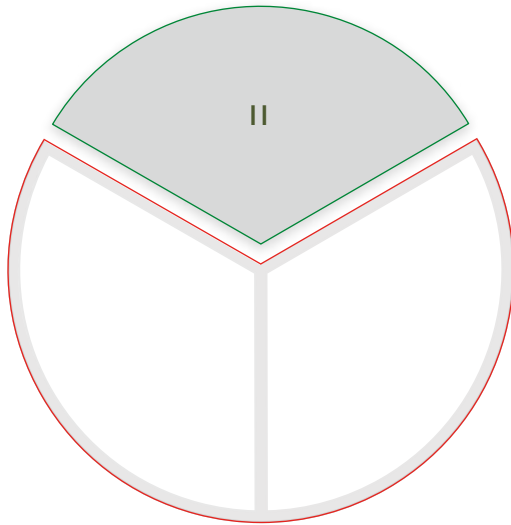


STREPTOCOCCUS SPP.



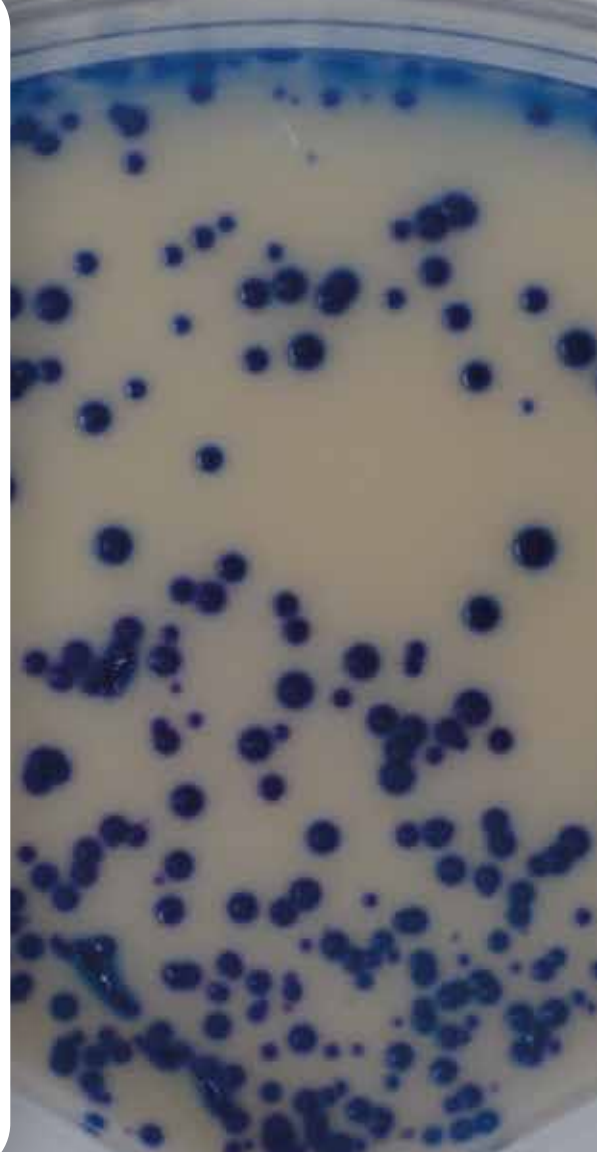
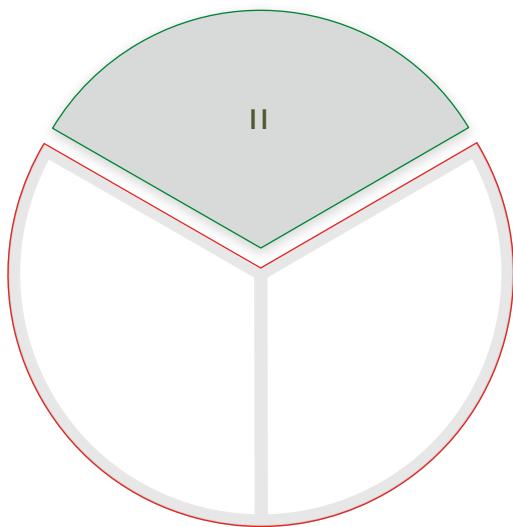
STREPTOCOCCUS SPP.

Light blue



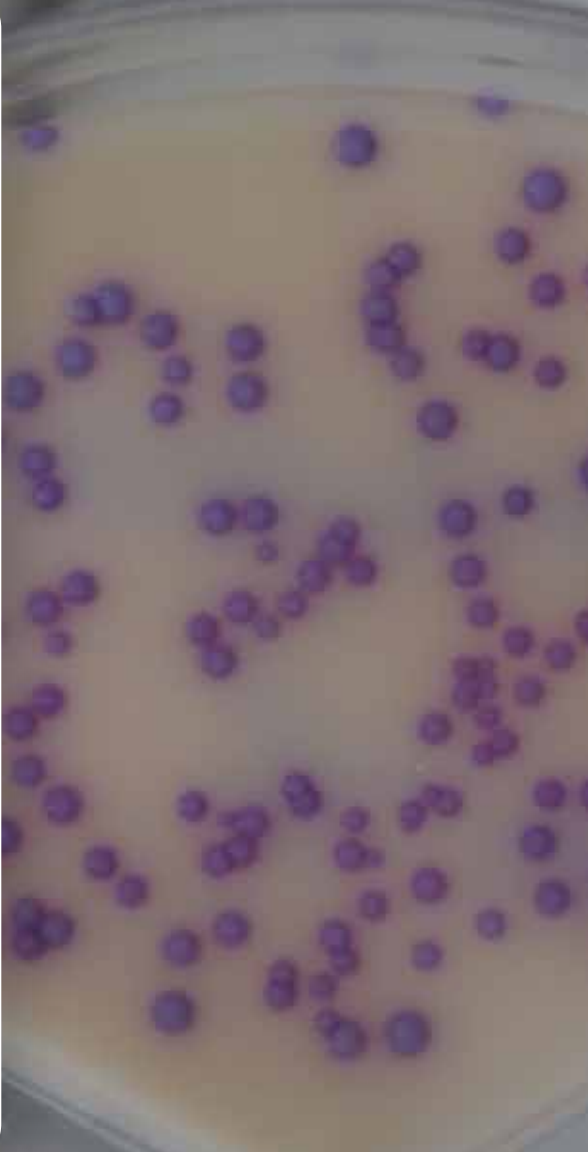
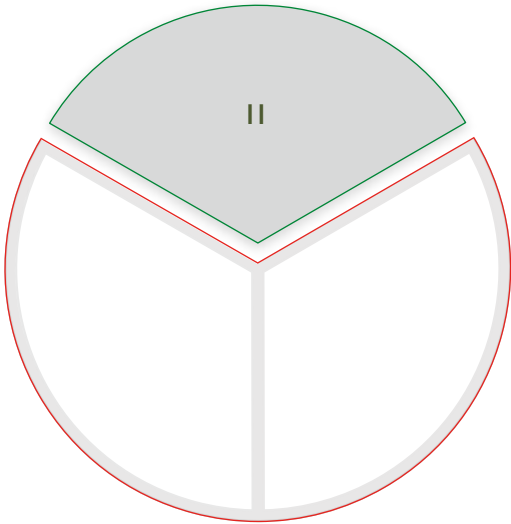
STREPTOCOCCUS UBERIS

Dark blue



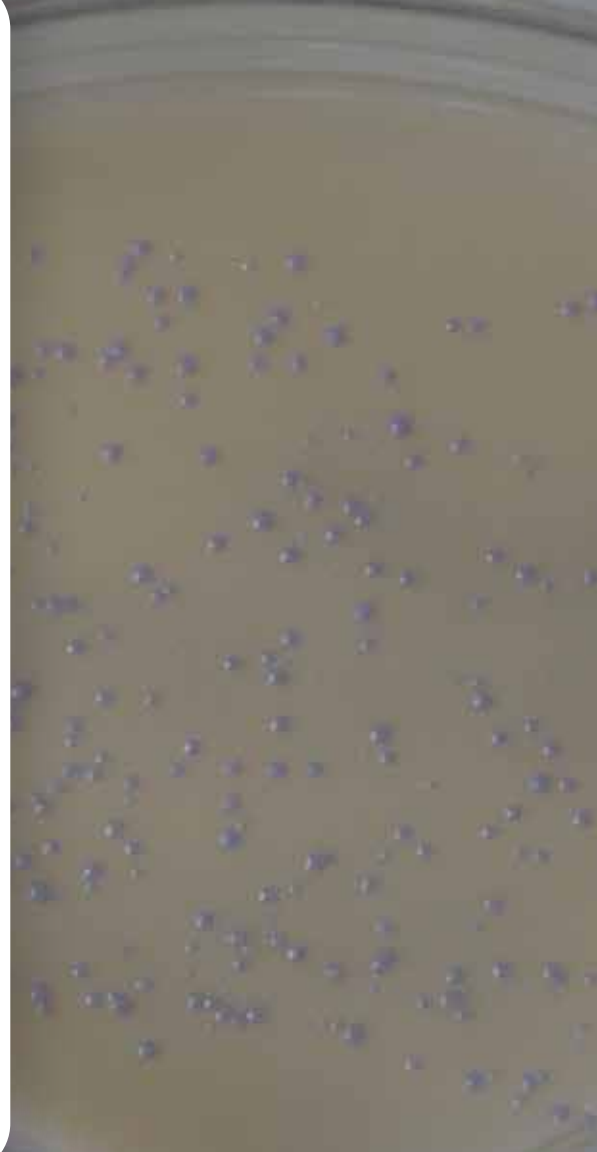
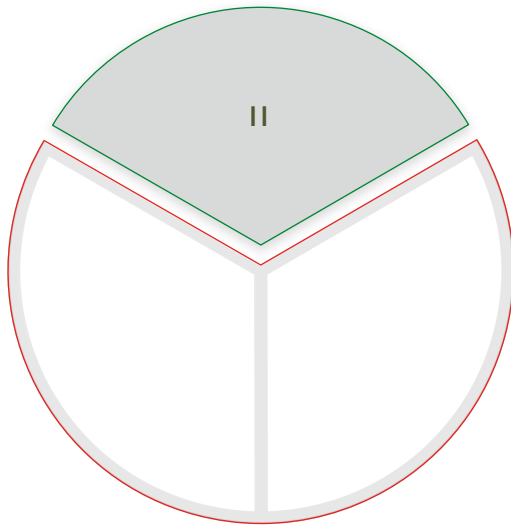
ENTEROCOCCUS SPP.

Large purple colonies

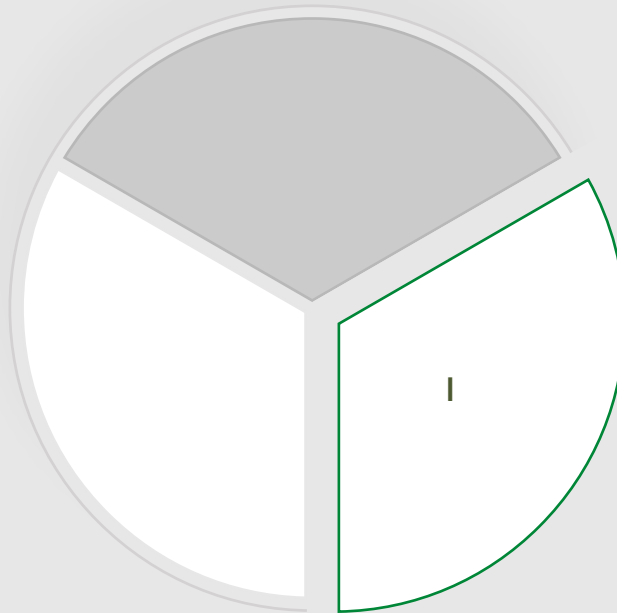


LACTOCOCCUS SPP.

Small lavender or White colonies

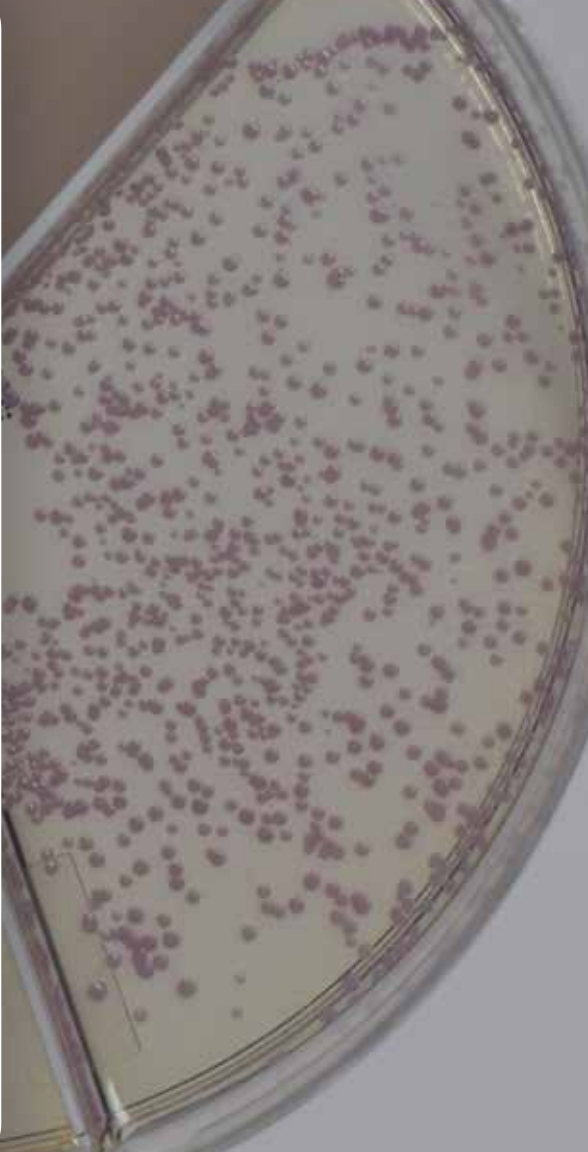
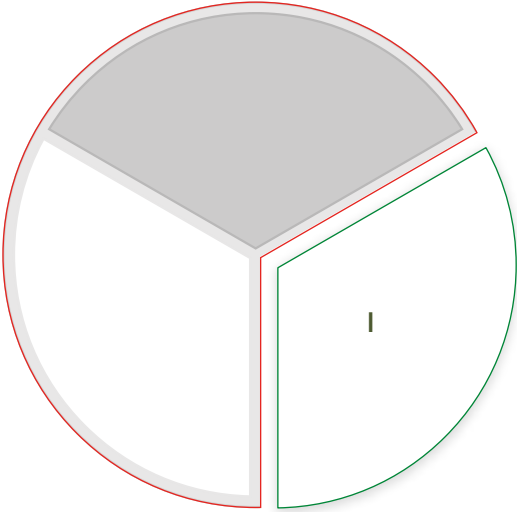


STAPHYLOCOCCUS SPP.



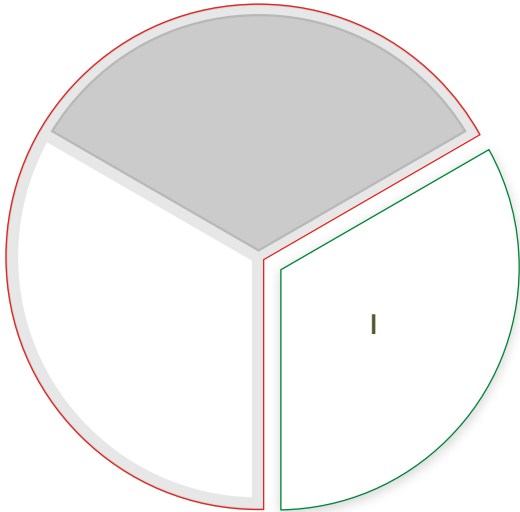
STAPHYLOCOCCUS AUREUS

Pink



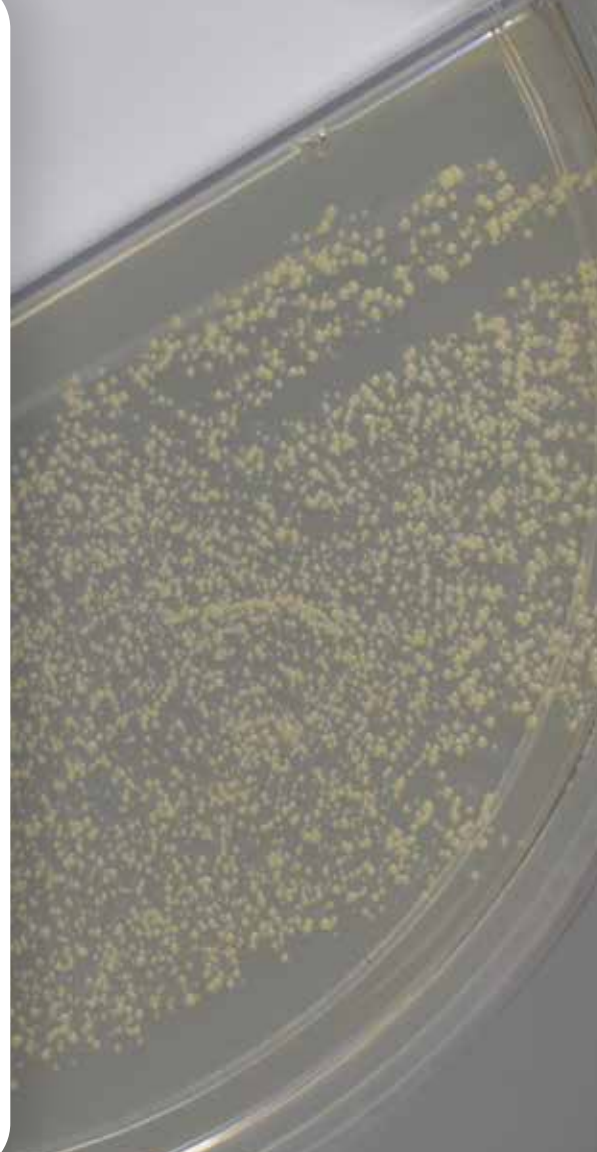
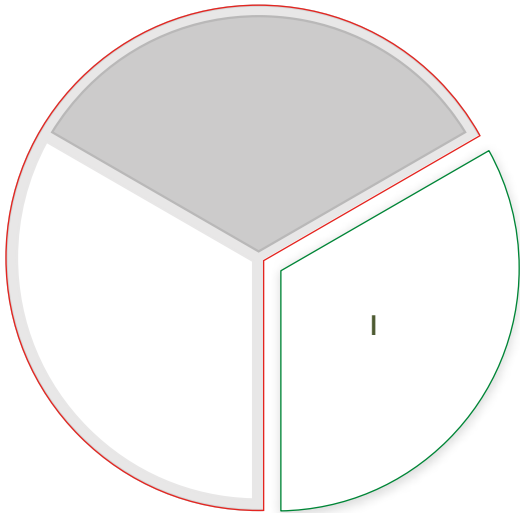
STAPHYLOCOCCUS HAEMOLYTICUS

Blue or green colonies



STAPHYLOCOCCUS CHROMOGENES

White/beige colonies





FERA

Diagnostics and Biologicals

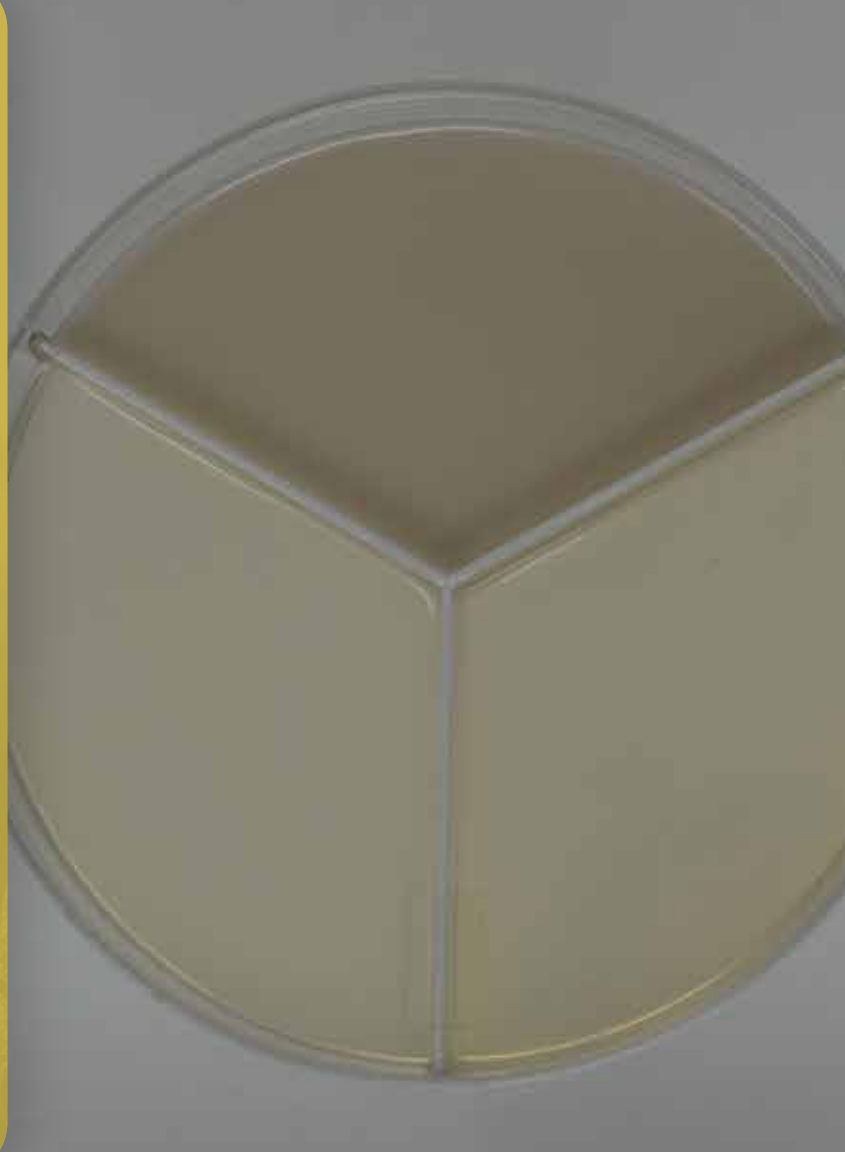
COLOR MATCHING AND
BACTERIAL IDENTIFICATION

 **ACCUMAST**[®]
THE POWER OF COLOR



A photograph of a cow in a field, overlaid with a semi-transparent yellow filter. The cow is facing left, and the background shows a field of flowers under a bright sky.

CULTURE
NEGATIVE



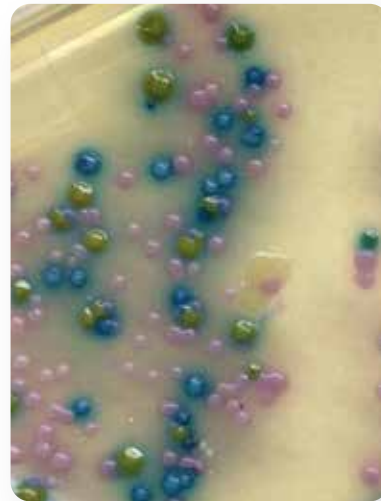
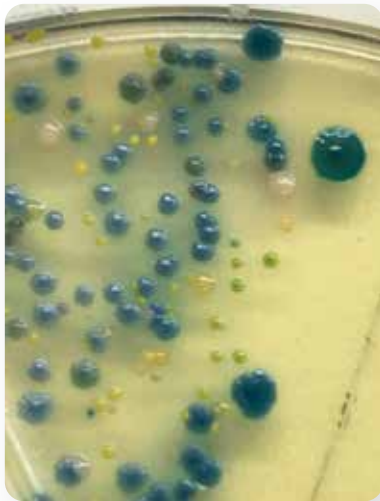
Culture negative is characterized by the absence of bacterial growth in the selective plates. A No Growth result may indicate that the bacterial is no longer present, most cases are due to spontaneous cure of the infection and antibiotic therapy is not likely to be beneficial.

Some plates may result in no bacterial growth, even if a cow has obvious signs of mastitis. This occurs for several reasons. We recommend to consult your veterinarian and investigate for the presence of Anaerobic bacteria, *Mycoplasma bovis*, and other unknown pathogens. Low bacteria load at the time that the sample is taken is also an obstacle to overcome, therefore we recommend to continuous sampling to catch the pathogen when it is in a shedding state.

Keep in mind that the clots, flakes, and abnormal milk secretions are a result of udder damage from the bacterial assault, not from the bacteria themselves. The artifact caused by blurring and milk clots are not bacterial colonies and are considered a negative result.

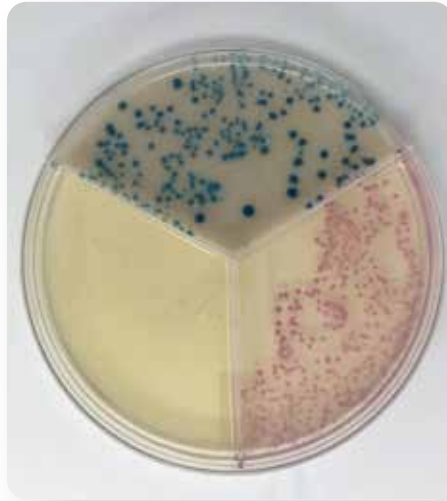
CONTAMINATED SAMPLE

Appears as multiple colored colonies in multiple sections



MIXED INFECTIONS

Pure colonies in multiple sections



A dark horse with a yellow ear tag is shown in profile, resting its head on a wooden surface. The background is a blurred stable environment with other horses and wooden beams. The overall lighting is dim and moody.

TREATMENT

ACCORDING TO
EACH DIAGNOSTIC

HOW TO TREAT MASTITIS CAUSED BY E. COLI?

Severe cases must be treated!

Systemic antibiotics treatment is recommended to reduce the risk of bacteremia

Supportive therapy

- 2 L of hypertonic saline (7.2%)
- 500 mL of Calcium borogluconate
- 500 mL of dextrose 50%
- Anti-inflammatory

HOW TO TREAT MASTITIS CAUSED BY KLEBSIELLA?

Severe cases must be treated with systemic broad-spectrum antibiotics and supportive therapy

- 2 L of hypertonic saline (7.2%)
- 500 mL of calcium borogluconate
- 500 mL of dextrose 50%
- Anti-inflammatory

Extended IM therapy with broad-spectrum antibiotics

Probability of cure of ~60-70%

Milk production is normally impaired throughout the productive life

PSEUDOMONAS SPP.

- **Sporadic occurrence**
- **It can occur in cases of outbreaks where a single source of contamination is detected**
 - Cloth towels used in the milking routine
- **Infections become chronic and do NOT respond to antimicrobials**
- **Permanent dry off the chronic mastitic quarters or culling**
- **Severe cases must be treated with systemic broad-spectrum antibiotics and fluid therapy**
 - 2 L of hypertonic saline (7.2%)
 - 500 mL of calcium borogluconate
 - 500 mL of dextrose 50%
 - Anti-inflammatory

OTHER GRAM-NEGATIVES PATHOGENS

Pasteurella, Pseudomonas, Serratia and Enterobacter

- Supportive therapy
- Do not use intramammary antibiotics

Severe cases must be treated with systemic broad-spectrum antibiotics and fluid therapy

- 2 L of hypertonic saline (7.2%)
- 500 mL of calcium borogluconate
- 500 mL of dextrose 50%
- Anti-inflammatory

HOW TO TREAT MASTITIS CAUSED BY STREP. UBERIS?

Severe cases must be treated with systemic broad-spectrum antibiotics and fluid therapy

- 2 L of hypertonic saline (7.2%)
- 500 mL of calcium borogluconate
- 500 mL of dextrose 50%
- Anti-inflammatory

Extended intra-mammary antibiotic therapy (5-8 days)

Systemic Antibiotics are NOT necessary

HOW TO TREAT MASTITIS CAUSED BY OTHER STREPTOCOCCUS SPP.?

**USE OF INTRA-MAMMARY ANTIBIOTIC
PROTOCOLS OF SHORT DURATION**

HOW TO TREAT MASTITIS CAUSED BY ENTEROCOCCUS?

**USE OF INTRA-MAMMARY ANTIBIOTIC
PROTOCOLS OF SHORT DURATION**

HOW TO TREAT MASTITIS CAUSED BY LACTOCOCCUS SPP.?

Extended intra-mammary antibiotic (5-8 days)

Systemic antibiotics are **NOT** necessary

HOW TO TREAT MASTITIS CAUSED BY STAPHYLOCOCCUS NON-AUREUS?

**USE OF INTRA-MAMMARY ANTIBIOTIC
PROTOCOLS OF SHORT DURATION**

HOW TO TREAT MASTITIS CAUSED BY STAPHYLOCOCCUS AUREUS?

Primiparous cows → USE OF INTRA-MAMMARY ANTIBIOTIC (5 – 8 days)

Multiparous cows → CULL

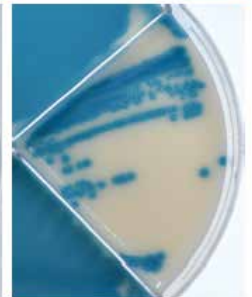
A dark-colored cow with a yellow ear tag is shown in profile, looking down at the ground. The background is a blurred barn interior with other cows. The text "DISCOVER OUR OTHER PRODUCTS" is overlaid in white, bold, sans-serif font, with a thin yellow horizontal line underneath the second line of text.

DISCOVER OUR
OTHER PRODUCTS

ACCUTREAT

FOR RAPID DETECTION OF MASTITIS PATHOGENS
THAT REQUIRE ANTIBIOTIC THERAPY.

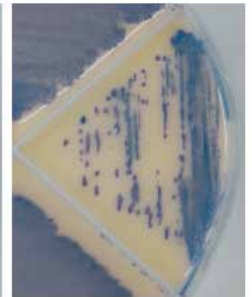
BLUE = *Streptococcus* spp.; *Lactococcus* spp. & *Enterococcus* spp.



PINK: *Staph. aureus*

ORANGE: *Staph. chromogenes*

PURPLE: *Staph. haemolyticus*



**Entire herd
management for identification
of Gram-positive pathogens**

ACCUSTAPH®

DESIGNED TO KEEP STAPH AUREUS AT BAY

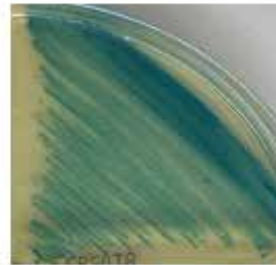
FOR USE WITH THE ACCUMAST® MASTITIS CULTURE SYSTEM;
SCREEN FOUR COWS FOR STAPHYLOCOCCUS AUREUS AT ONCE.

**Entire herd
control management for
Staphylococcus aureus**

PINK: Staphylococcus aureus



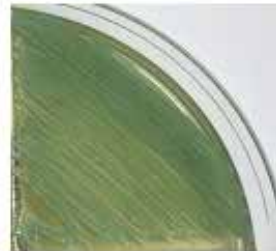
*BLUE: Staphylococcus
equorum*



*YELLOW: Staphylococcus
warneri*



*GREEN: Staphylococcus
haemolyticus*



*WHITE: Staphylococcus
chromogenes*



RESOURCES

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