

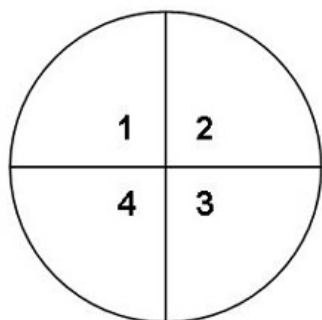
## Spectrum-MS™ Mastitis Culture System

### Product Information and Instructions

**Intended Use:** Spectrum-MS™ is a chromogenic culture system that can be used in conjunction with traditional methods to aid in the rapid identification of key bacterial organisms known to cause mastitis in cattle. The Spectrum-MS™ culture system is for veterinary use only.

**Product Features:** The Spectrum-MS™ culture system consists of a four chambered plate containing two selective chromogenic agars, VJ (Vogel and Johnson agar), and non-selective Tryptic Soy Agar with 5% sheep blood. This unique agar combination provides a comprehensive scheme for identifying the various infectious agents.

Spectrum™ chromogenic agars have been formulated to produce uniquely pigmented colonies when inoculated with those organisms for which the product has been validated. Each organism can then be visually differentiated on the basis of color and colony morphology. Depending upon the organism, color reactions may be either genus or species-specific. The Spectrum MS™ plate utilizes both Gram positive (Section 1) and Gram negative (Section 2) selective chromogenic agars.



VJ agar (Section 3) is a selective medium for the isolation of Staphylococci. Staphylococcus aureus typically produces a black colony surrounded by a yellow zone. Other Staphylococci may produce black colonies however the color of the media (red) will remain unchanged. Vogel-Johnson agar is markedly inhibitory to the growth of Gram positive organisms other than Staphylococci. Note: Partial inhibition may occur with some Gram negative organisms such as Proteus mirabilis and E. coli however the media will remain red.

Tryptic Soy agar with 5% Sheep blood (Section 4), commonly referred to as "blood agar", is a non-selective medium that supports the growth of a wide range of bacteria. When grown on blood agar, certain organisms will elaborate hemolysins that in turn will lyse the intact red blood cells within the medium creating a clear or green zone around each colony. While this reaction can aid in the identification of certain organisms, hemolysis by itself should not be used as a confirmatory test.

**Storage and Shelf Life:** Each Spectrum MS™ culture plate comes individually wrapped for extended shelf life. Plates should be stored at 2°-8° C (36°-46° F) inverted and protected from light.

**Precautions:** This product is for IN VITRO diagnostic use only. Specimens for culture may contain microorganisms that may be infectious to humans. Strict adherence to aseptic techniques and established precautions against biohazards should be followed throughout the procedure. Properly dispose of all inoculated plates and any implements that come into contact with patient specimens.

**Required Materials:** Spectrum MS™ quad plate, disposable alcohol wipes, 10 ul disposable calibrated inoculation loops, and sterile vials or containers for collecting milk sample. (A sterile urine specimen container is ideal.)

**Sample Collection:** \*\*\*\*For accurate results, samples must be collected aseptically. \*\*\*\*

1. Label the collection container with animal's ID.
2. Wash and dry the cow teats with soap and water.
3. Use a disposable alcohol wipe to sanitize the end of the teat.
4. Collect samples from all 4 teats. Strip each 2-3 times to flush out the teat canal before collecting the final sample for culture.
5. Carefully cap the collection container and take to lab.

**Procedure:** Spectrum MS™ plates should be removed from the refrigerator and allowed to warm to room temperature prior to inoculation. The surface of the agar should be inspected for moisture that could affect the growth of bacteria. If present, allow excess moisture to evaporate prior to use.

Carefully peel back the envelope containing the disposable inoculating loop using care not to touch the large loop end. Open the sample vial or cup and dip the loop into the milk sample. Transfer the sample to the first section of the Spectrum MS™ quad plate and streak using established plating techniques. Repeat for each quadrant of the plate. Place the inoculated plate with media inverted in a 37° C incubator.

At 16-24 hours post inoculation, inspect each section of the plate for bacterial growth and note the color and morphology of the resulting colonies in each of the four sections of the plate. For accurate results, **plates should be read no later than 24 hours** post inoculation. Prolonged incubation can alter the characteristic color reactions and may reduce the inhibitory properties of selective medias.

**Interpretation:** See table below and color chart provided. The descriptions and images displayed were obtained using pure cultures of the most commonly isolated subspecies of each organism. Some less common subspecies may produce different color reactions. Mixed cultures should be carefully interpreted. See notes following table for suggested ancillary testing methods that may further aid in identification. Presumptive and/or questionable results should be verified using traditional culture methods and/or sent to a qualified reference laboratory.

Organism	(1) Spectrum Gram +	(2) Spectrum Gram -	(3) Vogel-Johnson (VJ)	(4) TSA w/5% Blood	Catalase <sup>1</sup>	Oxidase <sup>2</sup>
<i>Streptococcus agalactiae</i>	Light blue pinpoint colonies.	No Growth	No Growth	Pinpoint semi-transparent colonies with clear zone of beta hemolysis. Some species non-hemolytic. V <sup>3</sup>	Neg	NA
<i>Streptococcus uberis</i>	Dark blue small colonies.	No Growth	No Growth	Pinpoint grayish colonies with some adjacent "greening".	Neg	Neg
<i>Staphylococcus aureus</i>	White to slightly yellow colonies. Some species will form mauve colonies. V <sup>3</sup>	No Growth	Black colonies surrounded by yellow zone.	Medium-sized white to gray raised glistening colonies. Clear zone of (beta) hemolysis.	Pos	NA
<i>E. coli</i>	No Growth	Medium to large pink colonies.	Generally no growth. Some rare species may produce a few black colonies.	Medium size gray colonies with characteristic odor. Most species are non-hemolytic. V <sup>3</sup>	Pos	Neg
<i>Klebsiella pneumoniae</i>	No Growth	Medium size metallic blue mucoid colonies; may or may not be surrounded by pink zone. V <sup>3</sup>	May produce a few black pinpoint colonies with no color change to media.	Large mucoid gray colonies. Non-hemolytic.	Pos	Neg
<i>Proteus mirabilis</i>	No Growth	Clear to slightly orange colonies surrounded by brown pigment diffusing into media.	Some species may produce small black colonies with no color change to media.	Gray mucoid growth swarming over plate. Distinct colonies are rarely seen. Brown pigment diffusing into media.	Pos	Neg
<i>Enterobacter Spp.</i>	No Growth	Large metallic blue colonies surrounded by pink halo.	No Growth	Large mucoid gray colonies. Non-hemolytic.	Pos	Neg
<i>Candida albicans</i> <sup>4</sup>	Medium to large mauve colonies. Some species may produce white colonies. V <sup>3</sup>	Small to medium off-white colonies	Medium to large gray mucoid colonies. No color change to medium.	Moist, opaque white to gray medium to large colonies.	NA	NA

<sup>1</sup> The Catalase test using 3% hydrogen peroxide may aid in differentiating Staphylococcus from Streptococcus species.

<sup>2</sup> The Oxidase test can be helpful in differentiating Pseudomonas aeruginosa from other Gram negative bacteria and some Staphylococcus species. Oxyswab® (Prod. #MCR-GL60500) provides a simple method for performing this test.

<sup>3</sup> Indicates the potential for variability in color and growth characteristics of certain organisms.

<sup>4</sup> Candida albicans and other yeasts will generally grow in all quadrants. Use Gram stain to differentiate from bacteria. Yeasts will appear as large, Gram positive budding cells.

**Antibiotic Sensitivity:** Organisms may be harvested directly from the Spectrum agar plate for sensitivity testing using the Kirby-Bauer disk diffusion method. Do not perform sensitivity testing on organisms harvested from blood agar.

**Limitations of the Procedure:** The following factors may affect organism growth and colony color:

- Improper specimen collection, storage, and inoculation.
- Initiation of antimicrobial therapy prior to inoculation.
- Improper incubation temperature and duration.
- Improper handling and storage of media prior to inoculation.

**Packaging:** Spectrum MS<sup>tm</sup> is packaged as 10 individually wrapped plates per box. Reorder Product No. MCR-PLTSP400.

*Spectrum<sup>TM</sup>, Spectrum-Plus<sup>TM</sup> and Spectrum-MS<sup>TM</sup> culture systems are manufactured and distributed exclusively by:*

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