

## QUALITY CONTROL PROCEDURES

### I INTRODUCTION

Baird-Parker Agar is used for the selective isolation and enumeration of coagulase-positive staphylococci from food, skin, soil, air and other materials. It may also be used for identification of staphylococci on the basis of their ability to clear egg yolk.

### II PERFORMANCE TEST PROCEDURE

- Inoculate representative samples with the cultures listed below.
  - Streak inoculate the plates with  $10^3 - 10^4$  CFU using a 10  $\mu$ L (0.01 mL) loop.
  - Incubate at  $35 \pm 2$  °C for 18 – 48 h under appropriate atmospheric conditions.
  - Include plates of a previously tested lot of TSA with 5% Sheep Blood as controls for inhibited strains.
- Examine plates at time interval specified above for growth, colony color, zone of clearing and selectivity.
- Expected Results

Organisms	ATCC®	Recovery	Colony Color/Clear Zone
* <i>Escherichia coli</i>	25922	Inhibition (complete)	N/A
* <i>Staphylococcus aureus</i>	25923	Moderate to heavy growth	Blackening/Yes
<i>Staphylococcus aureus</i>	13150	Moderate to heavy growth	Blackening/Yes
* <i>Staphylococcus epidermidis</i>	12228	Inhibition (partial to complete)	May blacken/No

\*Recommended organism strain for User Quality Control.

### III ADDITIONAL QUALITY CONTROL

- Examine plates as described under "Product Deterioration."
- Visually examine representative plates to assure that any existing physical defects will not interfere with use.
- Determine the pH potentiometrically at room temperature for adherence to the specification of  $7.0 \pm 0.2$ .
- Note the firmness of the agar beds during the inoculation procedure.
- Incubate uninoculated representative plates at  $33 - 37$  °C for 72 h and examine for microbial contamination.

## PRODUCT INFORMATION

### IV INTENDED USE

Baird-Parker Agar is a selective and differential medium used for the isolation and presumptive identification of coagulase-positive staphylococci (*Staphylococcus aureus*) from clinical specimens, foods, air, water and other materials.

### V SUMMARY AND EXPLANATION

Baird-Parker developed this medium to facilitate the isolation and detection of coagulase-positive staphylococci (*S. aureus*).<sup>1-3</sup> The medium is a modification of tellurite glycine medium, with sodium pyruvate added to enhance the growth of staphylococci and egg yolk emulsion used as a differential agent.<sup>4</sup>

*S. aureus* typically produces shiny, black, convex colonies surrounded by clear zones.<sup>5</sup> Most other species produce irregular colonies that may have wide, opaque zones in the surrounding medium. Other organisms may also grow (*Bacillus*, some yeasts and micrococci), but can be easily differentiated based on colony morphology.

### VI PRINCIPLES OF THE PROCEDURE

Enzymatic digest of casein and beef extract provide amino acids and other complex nitrogenous substances. Yeast extract primarily supplies the B-complex vitamins. Potassium tellurite, lithium chloride and glycine suppress the growth of most organisms other than *S. aureus*. Egg yolk emulsion and pyruvate increase the recovery of heat-stressed cells, presumably by destroying peroxides.<sup>5,6</sup>

Colonies of *S. aureus* form a characteristic black pigmentation by reducing the potassium tellurite and form clear zones in the medium due to proteolysis of the egg yolk emulsion. Lecithinase or lipase production results in the formation of a smaller, opaque zone within the clear zone. There is a high correlation of the above reactions with the coagulase test.<sup>5</sup>

Coagulase-negative species are usually inhibited, but if they grow, generally produce an irregular colony that may be surrounded by a wide, opaque zone in the surrounding medium. Other organisms may grow occasionally, but can be differentiated from coagulase-positive staphylococci based on pigmentation and other morphological characteristics.

### VII REAGENTS

#### Baird-Parker Agar

Approximate Formula\* Per Liter Purified Water

Pancreatic Digest of Casein .....	10.0 g	Glycine .....	12.0 g
Beef Extract .....	5.0 g	Sodium Pyruvate .....	10.0 g
Yeast Extract .....	1.0 g	Potassium Tellurite Solution, 1% .....	10.0 mL
Lithium Chloride .....	5.0 g	Egg Yolk Emulsion, 50% .....	50.0 mL
Agar .....	17.0 g		

\*Adjusted and/or supplemented as required to meet performance criteria.

#### Warnings and Precautions: For *in vitro* Diagnostic Use.

If excessive moisture is observed, invert the bottom over an off-set lid and allow to air dry in order to prevent formation of a seal between the top and bottom of the plate during incubation.

Pathogenic microorganisms, including hepatitis viruses and Human Immunodeficiency Virus, may be present in clinical specimens. "Standard Precautions"<sup>7-10</sup> and institutional guidelines should be followed in handling all items contaminated with blood and other body fluids. After use, prepared plates, specimen containers and other contaminated materials must be sterilized by autoclaving before discarding.

**Storage Instructions:** On receipt, store plates in the dark at 2 – 8 °C. Avoid freezing and overheating. Do not open until ready to use. Minimize exposure to light. Prepared plates stored in their original sleeve wrapping at 2 – 8 °C until just prior to use may be inoculated up to the expiration date and incubated for recommended incubation times. Allow the medium to warm to room temperature before inoculation.

**Product Deterioration:** Do not use plates if they show evidence of microbial contamination, discoloration, drying, cracking, or other signs of deterioration.

## VIII SPECIMEN COLLECTION AND HANDLING

Refer to appropriate texts for details of specimen collection and handling procedures.<sup>11–14</sup>

Specimens should be obtained before antimicrobial agents have been administered. Provision must be made for prompt delivery to the laboratory.

For isolation of *S. aureus* from foods, consult an appropriate reference.<sup>15</sup>

## IX PROCEDURE

**Material Provided:** Baird-Parker Agar

**Materials Required But Not Provided:** Ancillary culture media, reagents, quality control organisms and laboratory equipment as required.

**Test Procedure:** Observe aseptic techniques.

The agar surface should be smooth and moist, but without excessive moisture.

Inoculate the medium as soon as possible after the specimen arrives at the laboratory. To culture a specimen from a swab, inoculate the medium by rolling the swab over a third of the agar surface, and streak the remainder of the plate to obtain isolated colonies. Material not being cultured from swabs should be streaked onto the medium with a sterile inoculating loop. The streak plate technique is used primarily to obtain isolated colonies from specimens containing mixed flora.

For food samples, maserate the sample with a sterile needle or glass spatula and dilute as desired. Distribute 1 mL of the diluted specimen equally among three plates, and spread the inocula over the agar surface with a sterile, bent, glass rod.

Incubate the plates in an inverted position (agar side up) at 35 °C for 24 – 48 h.

**User Quality Control:** See “Quality Control Procedures.”

Quality control requirements must be performed in accordance with applicable local, state and/or federal regulations or accreditation requirements and your laboratory’s standard Quality Control procedures. It is recommended that the user refer to pertinent CLSI guidance and CLIA regulations for appropriate Quality Control practices.

## X RESULTS

After sufficient incubation, the plates should show isolated colonies in streaked areas and confluent growth in areas of heavy inoculation.

Coagulase positive staphylococci produce shiny, black colonies surrounded by clear zones. Opaque zones may form within the clear zones. If coagulase-negative species grow, they generally produce colonies with wide, opaque zones in the surrounding medium. Colonies of coagulase-negative species may exhibit some blackening.

Gram staining, biochemical tests and other identification procedures should be performed to confirm findings.

## XI LIMITATIONS OF THE PROCEDURE

This prepared plated medium is intended for primary isolation. Some diagnostic tests may be performed with the primary plate. However, a pure culture is recommended for biochemical tests and serological procedures. Consult appropriate references for further information.<sup>13–16</sup>

A single medium is rarely adequate for detecting all organisms of potential significance in a specimen. The agents in selective media may inhibit some strains of the desired species or permit growth of a species they were designed to inhibit, especially if the species is present in large numbers in the specimen. Specimens cultured on selective media should also be cultured on nonselective media to obtain additional information and help ensure recovery of potential pathogens.

## XII AVAILABILITY

Cat. No.	Description
297214	BD BBL™ Baird-Parker Agar
297725	BD BBL™ Baird-Parker Agar

## XIII REFERENCES

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