BBL™ Selenite Cystine Broth

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QUALITY CONTROL PROCEDURES

R_x Only

I INTRODUCTION

BD BBL™ Selenite Cystine Broth is used as a selective enrichment medium for the isolation of *Salmonella* from feces, foods, pharmaceutical articles, water and other materials of sanitary importance.

II PERFORMANCE TEST PROCEDURE

1. Inoculate representative samples with 1.0 mL of organism suspension of *S. typhimurium* ATCC™ 14028 and *S. sonnei* ATCC 9290 diluted to yield 10^3 CFU/mL. To each tube previously inoculated add 0.1 mL of *E. coli* ATCC 11775 diluted to yield 10^2 CFU/0.1 mL.
2. Subculture the tubes to **BBL™** MacConkey II Agar at 18–24 h incubation at 35 ± 2 °C in an aerobic atmosphere. Plates are incubated at 35 ± 2 °C for 18–24 h in an aerobic atmosphere.
3. Expected Results

Organisms	ATCC®	Recovery Growth on MacConkey II Agar after subculture from BD BBL Selenite Cystine Broth at 18–24 h
**Salmonella enterica* subsp. *enterica* serotype *Typhimurium*	14028	Fair to heavy growth of colorless colonies
**Shigella sonnei*	9290	Fair to heavy growth of colorless colonies
**Escherichia coli*	11775	Partial to complete inhibition

*Recommended organism strain for User Quality Control.

III ADDITIONAL QUALITY CONTROL

1. Examine tubes for signs of deterioration as described under “Product Deterioration.”
2. Visually examine representative tubes to assure that any existing physical defects will not interfere with use.
3. Determine the pH potentiometrically at room temperature for adherence to the specification of 7.0 ± 0.2.
4. Incubate uninoculated representative samples at 20–25 °C and 30–35 °C and examine after 7 days for microbial contamination.

PRODUCT INFORMATION

IV INTENDED USE

BD BBL Selenite Cystine Broth is used as a selective enrichment medium for the isolation of *Salmonella* from feces, foods, pharmaceutical articles, water and other materials of sanitary importance.

V SUMMARY AND EXPLANATION

BD BBL Selenite Cystine Broth is the formulation by Leifson[1] with cystine added. Leifson determined that **BD BBL** Selenite Broth favored the growth of *Salmonella* while reducing growth of fecal coliforms and enterococci.[1] The growth and recovery of *Salmonella* in food samples can be hindered by non-*Salmonella* bacteria, substances indigenous to the food sample and, in dried processed food, the *Salmonella* may be present in low numbers and in an injured condition.[2] Using protocols that involve pre-enrichment, selective enrichment and selective plating increases the likelihood of recovering *Salmonella*. In most standard method procedures, **BD BBL** Selenite Cystine Broth is recommended in the selective enrichment step.[2-6] As a selective enrichment medium, **BD BBL** Selenite Cystine Broth is formulated to allow the proliferation of *Salmonella*, while inhibiting the growth of competing non-*Salmonella* bacteria.[2]

BD BBL Selenite Cystine Broth and similar enrichment media are also useful for detecting *Salmonella* in the non-acute stages of illness when the organisms occur in the feces in low numbers and for epidemiological studies to enhance the detection of low numbers of organisms from asymptomatic or convalescent patients.[7]

VI PRINCIPLES OF THE PROCEDURE

BD BBL Selenite Cystine Broth contains tryptone as a source of carbon, nitrogen, vitamins and minerals. Lactose is the carbohydrate. Sodium acid selenite inhibits gram-positive bacteria and most enteric gram-negative bacteria except *Salmonella*. L-cystine is a reducing agent.

VII REAGENTS

BD BBL Selenite Cystine Broth

Approximate Formula* Per Liter Purified Water

Pancreatic Digest of Casein	5.0 g	Sodium Acid Selenite	4.0 g
Lactose	4.0 g	L-Cystine	0.01 g
Sodium Phosphate	10.0 g		

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

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

Tubes with tight caps should be opened carefully to avoid injury due to breakage of glass.

Pathogenic microorganisms, including hepatitis viruses and Human Immunodeficiency Virus, may be present in clinical specimens. “Standard Precautions”[8-11] and institutional guidelines should be followed in handling all items contaminated with blood and other body fluids. Prior to discarding, sterilize prepared tubes, specimen containers and other contaminated materials by autoclaving.

Storage Instructions: On receipt, store tubes at 2–8 °C. Avoid freezing and overheating. Do not open until ready to use. Minimize exposure to light. Tubed media stored as labeled 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 tubes if they show evidence of microbial contamination, discoloration, drying or other signs of deterioration.

VIII SPECIMEN COLLECTION AND HANDLING

Refer to appropriate references for details of specimen collection and handling procedures.[12,13] Specimens should be obtained before antimicrobial agents have been administered. Provision must be made for prompt delivery to the laboratory.

IX PROCEDURE

Material Provided: BD BBL Selenite Cystine Broth

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

Test Procedure: Observe aseptic techniques.

For feces, food samples or other solid materials, suspend 1–2 g of the specimen in the broth (approximately 10–15% by volume) and emulsify with an inoculating needle, if necessary. Consult references for information about the processing and inoculation of other samples or specimens.[2,4-6,14]

Incubate the tubes at 35 °C and subculture onto selective and differential media (e.g., MacConkey Agar, XLD Agar, XLT4 Agar, **CHROMagar®** Salmonella) after 6–8 h of incubation and again after 12–24 h of incubation.

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

Results should be consistent with those of the quality control strains.

After incubation, the number of colonies of pathogens the medium is designed to select should increase. Subculture onto appropriate selective and differential media to isolate pathogens for identification.

XI LIMITATIONS OF THE PROCEDURE

Since nutritional requirements of organisms vary, some strains may be encountered that fail to grow or grow poorly in this medium.

Enrichment broths should not be used as the sole isolation medium. They are to be used in conjunction with selective and nonselective plating media to increase the probability of isolating pathogens, especially when they may be present in small numbers. Consult references for detailed information and recommended procedures.[2,4,6]

XII PERFORMANCE CHARACTERISTICS

Prior to release, all lots of **BD BBL** Selenite Cystine Broth are tested for specific product characteristics. Samples are tested with cell suspensions of *S. typhimurium* ATCC 14028 (1 mL of 10^3 CFU/mL dilution), *E. coli* ATCC 11775 (0.1 mL of 10^2 CFU/0.1 mL dilution) and *S. sonnei* ATCC 9290 (1 mL of 10^3 CFU/mL dilution). Inoculated tubes are subcultured to **BBL** MacConkey II Agar at 18–24 h incubation at 35 ± 2 °C in an aerobic atmosphere. Plates are incubated at 35 ± 2 °C for one day in an aerobic atmosphere. Fair to heavy growth is observed with *S. typhimurium* and *S. sonnei* at 24 h. *E. coli* is partially to completely inhibited at 18–24 h.

XIII AVAILABILITY

Cat. No.	Description
292525	**BD BBL™** Selenite Cystine Broth, 10 mL, Ctn. of 100 size A tubes
297711	**BD BBL™** Selenite Cystine Broth, 20 mL, Ctn. of 100 size A tubes

XIV REFERENCES

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