Selenite Broth • Selenite-F Broth

Intended Use

Selenite Broth (Selenite-F Broth) is used as an enrichment medium for the isolation of *Salmonella* from feces, urine, water, foods and other materials of sanitary importance.

Summary and Explanation

Selenite Broth was devised by Leifson,[1] who demonstrated that selenite was inhibitory for coliforms and certain other microbial species, such as fecal streptococci, present in fecal specimens and, thus, was beneficial in the recovery of *Salmonella* species. He found that the inhibited strains would eventually break through, but if subcultures were made from the enrichment broth after 8-12 hours of incubation, the isolation of *Salmonella* was possible without overwhelming growth of many members of the intestinal flora.

Enrichment media are routinely employed for detection of pathogens in fecal specimens since the pathogens usually represent only a small percentage of the intestinal flora. Selenite Broth and the related medium, Selenite Cystine Broth, are recommended for use in the recovery of *Salmonella* with subcultures being made after 12-18 hours of incubation. For detection of *Shigella*, GN Broth is a satisfactory enrichment medium.[2] Campylobacter Thioglycollate Medium with 5 Antimicrobics is recommended for specimens suspected to contain *Campylobacter jejuni*.[3]

Principles of the Procedure

The peptone provides essential nitrogenous and carbon compounds. The lactose in the medium serves to maintain a uniform pH. When selenite is reduced by the growth of bacteria, alkali is produced, and such increase in pH would lessen the toxicity of the selenite and result in overgrowth of extraneous bacteria. The acid produced by lactose fermentation serves to maintain a neutral or slightly decreased pH. The function of the phosphate is two-fold; it serves to maintain a stable pH and lessens the toxicity of the selenite, thus increasing the capacity of the medium. Sodium selenite inhibits many species of gram-positive and gram-negative bacteria including enterococci and coliforms.

User Quality Control

Identity Specifications

Difco™ Selenite Broth

Dehydrated Appearance:	Off-white, free-flowing, homogeneous.
Solution:	2.3% solution, soluble in purified water upon boiling. Solution is very light amber, clear to very slightly opalescent, may have a slight precipitate.
Prepared Appearance:	Very light amber, clear to very slightly opalescent, may have a slight precipitate.
Reaction of 2.3% Solution at 25°C:	pH 7.0 ± 0.2

Cultural Response

Difco™ Selenite Broth

Prepare the medium per label directions. Inoculate and incubate at 35 ± 2°C for 18-24 hours. After incubation, subculture onto MacConkey Agar plates and incubate plated media at 35 ± 2°C for 18-24 hours.

ORGANISM	ATCC™	INOCULUM CFU	RECOVERY	COLONIES ON MACCONKEY AGAR
Escherichia coli	25922	10^2-10^3	Partial inhibition	Pink with bile precipitate
Salmonella enterica subsp. *enterica* serotype Typhimurium	14028	10^2-10^3	Good	Colorless

Formula

Difco™ Selenite Broth

Approximate Formula* Per Liter

Pancreatic Digest of Casein	5.0	g
Lactose	4.0	g
Sodium Selenite	4.0	g
Sodium Phosphate	10.0	g

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

Directions for Preparation from Dehydrated Product

1. Suspend 23 g of the powder in 1 L of purified water.
2. Heat to boiling. Avoid overheating. DO NOT AUTOCLAVE.
3. Test samples of the finished product for performance using stable, typical control cultures.

Procedure

For feces and 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.

Incubate tubes with loosened caps at 35 ± 2°C for up to 24 hours. Subcultures should be made after 12-18 hours of incubation, if possible. Coliforms will tend to overgrow the pathogens if incubated longer than 24 hours.

Expected Results

After incubation, there should be an increase in the number of pathogens that the medium is designed to select for and enrich. Subculture onto appropriate selective and differential media (e.g., MacConkey Agar, Hektoen Enteric Agar, XLD Agar, XLT4 Agar, **CHROMagar**™ Salmonella) to isolate pathogens for identification.

Limitation of the Procedure

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.[3]

References

1. Leifson. 1936. Am. J. Hyg. *24*:423.
2. Taylor and Harris. 1965. Am. J. Clin. Pathol. *44*:476.
3. Murray, Baron, Jorgensen, Landry and Pfaller (ed.). 2007. Manual of clinical microbiology, 9th ed. American Society for Microbiology, Washington, D.C.

Availability

Difco™ Selenite Broth

BS12 MCM9 SMWW

Cat. No. 227540 Dehydrated – 500 g

BBL™ Selenite-F Broth

BS12 MCM9 SMWW

Cat. No. 221020 Prepared Tubes (K Tubes), 8 mL – Pkg. of 10*
221021 Prepared Tubes (K Tubes), 8 mL – Ctn. of 100*

**Store at 2-8°C.*