SELENITE BROTH w/ and w/o CYSTINE

INTENDED USE
Remel Selenite Broth w/ and w/o Cystine are liquid media recommended for use in qualitative procedures for selective enrichment of *Salmonella*, and to a lesser degree *Shigella sonnei.*

SUMMARY AND EXPLANATION
Selenite Broth was developed by Leifson for enrichment of *Salmonella* from sources such as feces, urine, and food. Selenite was found to inhibit coliforms and fecal streptococci; however, breakthrough of inhibited strains would occur after 12-18 hours of incubation.[1] Cystine enhances the recovery of *Salmonella* and allows for incubation periods longer than 12-18 hours.[2] Selenite Broth w/ Cystine is recommended by the Food and Drug Administration for detection of *Salmonella* in food materials and in the *United States Pharmacopeia* for microbial limits testing.[3,4] Selenite Broth w/ and w/o Cystine are especially useful for recovery of *Salmonella* and *Shigella* occurring in low numbers in certain clinical specimens, and for epidemiological studies to detect organisms from asymptomatic or convalescent patients.[5]

PRINCIPLE
Casein peptone supplies nitrogenous substances and carbon compounds required for bacterial growth. L-Cystine is an enrichment agent, which improves the recovery of *Salmonella*. Sodium phosphate maintains a stable pH and lessens the toxicity of the selenite. Lactose also serves to maintain an optimal pH. Bacteria that reduce selenite produce alkali and increase the pH. In turn, acid produced by lactose fermentation causes a decrease in pH which helps to maintain the broth at a neutral or slightly decreased pH. Gram-positive organisms are inhibited by sodium selenite.

REAGENTS (CLASSICAL FORMULAE)*

Sodium Phosphate	10.0 g	Lactose	4.0 g
Casein Peptone	5.0 g	Sodium Selenite	4.0 g
		Demineralized Water	1000.0 ml

pH 7.0 ± 0.2 @ 25°C

The following optional ingredient is available per liter of medium:
L-Cystine ..... 0.01 g

*Adjusted as required to meet performance standards

PROCEDURE
1. Inoculate the tube with 1-2 g of stool specimen or other solid material (approximately 10-15% by volume) and emulsify in the broth.
2. Incubate in ambient air at 35-37°C for up to 24 hours.
3. Subculture Selenite Broth after 12-18 hours incubation to selective and differential enteric plated medium, such as XLD or HE Agar. Streak for isolation. (Coliforms may overgrow the pathogens if incubated for longer than 24 hours.)
4. Incubate plates in ambient air at 35-37°C for 18-24 hours.
5. Examine for typical colonial morphology.

QUALITY CONTROL
All lot numbers of Selenite Broth w/ and w/o Cystine have been tested using the following quality control organisms and have been found to be acceptable. This quality assurance testing conforms with or exceeds CLSI standards.[6] Testing of control organisms should be performed in accordance with established laboratory quality control procedures. If aberrant quality control results are noted, patient results should not be reported.

CONTROL	INCUBATION	RESULTS
Selenite Broth:		
**Salmonella enterica* serovar Typhimurium ATCC® 14028	Ambient, 18-24h @ 33-37°C	Growth recovered on subculture
**Shigella sonnei* ATCC® 9290	Ambient, 18-24h @ 33-37°C	Growth recovered on subculture
**Escherichia coli* ATCC® 25922	Ambient, 18-24h @ 33-37°C	Inhibition (partial to complete) on subculture
Selenite Broth w/ Cystine:		
**Salmonella enterica* serovar Typhimurium ATCC® 14028	Ambient, 18-24h @ 33-37°C	Growth recovered on subculture
**Escherichia coli* ATCC® 25922	Ambient, 18-24h @ 33-37°C	Inhibition (partial to complete) on subculture

*CLSI recommended organism

LIMITATIONS
1. The inhibitory effect of selenite diminishes after the first 6-12 hours of incubation.[7]
2. Because most *Salmonella* strains die rapidly after full growth in Selenite Broth allowing for heavier growth of competitors, especially *Proteus*, incubation over 24 hours is not recommended.[7]
3. Discard media if selenite oxidizes and forms large amounts of a red precipitate. A small amount of colored precipitate is not detrimental.[1,7]
4. Selenite enrichment broth should be used in conjunction with selective and nonselective plated media to increase the liklihood of recovering pathogens, especially when they are present in small numbers. Do not use selenite broth as the sole isolation medium. Refer to references for recommended procedures.[5]

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Refer to the front of Remel *Technical Manual of Microbiological Media* for **General Information** regarding precautions, product storage and deterioration, specimen collection, storage and transportation, materials required, quality control, and limitations.

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