PRODUCT SPECIFICATION SHEET

Selenite Cystine Broth Base w/o Selenite(DM485)

Intended Use

Selenite Cystine Broth w/o Selenite (DM485) is recommended for enrichment and isolation of *Salmonella* from feces, urine, water, foods and other materials of sanitary importance.

Product Summary and Explanation

Selective inhibitory effects of selenite were first demonstrated by Klett.[1] Guth[2] used it to isolate *Salmonella typhi*. Leifson[3] found that selenite inhibited fecal streptococci and coliforms during the first 8-12 hours of incubation, thereby permitting salmonellae to replicate without overwhelming interference from other members of the intestinal flora. North and Bartram[4] modified Leifson's Selenite-F Enrichment broth by adding cystine, which stimulated growth of *Salmonella*. The cystine-containing formulation is recommended by the Food and Drug Administration, AOAC International and American Public Health Association for detecting *Salmonella* in foods, particularly egg products and waters.[5-8] It is also recommended by APHA and USP.[9, 10] Selenite Cystine Broth is useful for detecting *Salmonella* in the non-acute stages of illness when organisms occur in the faeces in low numbers and for epidemiological studies to enhance the detection of low numbers of organisms from asymptomatic or convalescent patients.[11] *Salmonella* are also injured during various food processing procedures, including exposure to low temperatures, submarginal heat, drying, radiation, preservatives or sanitizers.[12] Since, *Salmonella* may be present in low numbers in food sample in an injured condition; recovery of *Salmonella* involves pre-enrichment, selective enrichment and selective plating. Fluid Selenite Cystine Medium is used as selective enrichment medium for the cultivation of *Salmonella* species. This medium is formulated to allow the proliferation of *Salmonella* while inhibiting the growth of competing non-*Salmonella* organisms.

Principles of the Procedure

Selenite Cystine Broth contains casein enzymic hydrolysate provides nitrogenous substances. Lactose is the fermentable carbohydrate and maintains the pH in medium as selenite is reduced by bacterial growth and alkali is produced. An increase in pH lowers the toxicity of the selenite and results in overgrowth of other bacteria. The acid produced by bacteria due to lactose fermentation serves to maintain a neutral pH. Phosphate maintains a stable pH and also lessens the toxicity of selenite. L-cystine is the reducing agent, improving the recovery of *Salmonella*. Enriched broth is subcultured on solid medium. Do not incubate the broth longer than 24 hours as inhibitory effect of selenite reduces after 6 - 12 hours of incubation.[13]

Formula / Liter

Ingredients	Gms / Liter
Casein enzymic hydrolysate	5.00
Lactose	4.00
Sodium phosphate	10.00
L-Cystine	0.01
Final pH: 7.0 ± 0.2 at 25°C	
Formula may be adjusted and/or supplemented as required to meet performance specifications	

Precautions

1. For Laboratory Use only.
2. IRRITANT. Irritating to eyes, respiratory system, and skin.
3. Sodium hydrogen selenite (Sodium bi-selenite) is very toxic, corrosive agent and causes teratogenicity. Handle with great care. Upon contact with skin, wash immediately with a lot of water.

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Directions

1. Suspend 19 grams in one liter of distilled water.
2. Add 4 grams of sodium hydrogen selenite. Mix well.
3. Warm to dissolve the medium completely.
4. Distribute in sterile test tubes.
5. Sterilize in a boiling water bath or free flowing steam for 10 minutes.
6. DO NOT AUTOCLAVE.
7. Excessive heating is detrimental. Discard the prepared medium if large amount of selenite is reduced (indicated by red precipitate at the bottom of tube / bottle).

Caution: Sodium hydrogen selenite (Sodium biselenite) is very toxic and corrosive agent and causes teratogenicity. Handle with great care. If there is contact with skin, wash immediately with lot of water.

Quality Control Specifications

Dehydrated Appearance	Cream to yellow homogeneous free flowing powder
Prepared Medium	Light yellow coloured, clear to slightly opalescent solution of complete medium
Reaction of (1.9% w/v of medium along with 0.4% w/v Selenite solution	pH : 7.0 ± 0.2 at 25°C
Gel Strength	Not Applicable

Expected Cultural Response: Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours when sub cultured on MacConkey Agar.

Sr. No.	Organisms	Results to be achieved		
		Inoculum (CFU)	Growth	Colour of the medium
1.	*Escherichia coli ATCC 25922*	50-100	little-none (no increase in numbers)	pink with bile precipitate
2.	*Salmonella choleraesuis ATCC 12011*	50-100	good-luxuriant	colourless
3.	*Salmonella typhimurium ATCC 14028*	50-100	good-luxuriant	colourless
4.	*Salmonella typhi ATCC 6539*	50-100	good-luxuriant	colourless

The organisms listed are the minimum that should be used for quality control testing.

Test Procedure

1. Prepare food sample following the recommended procedure.
2. Inoculate into recommended pre-enrichment broth.
3. Transfer 1 mL of mixture to 10 mL Selenite Cystine Broth and to 10 mL Tetrathionate Broth.
4. Incubate at 35°C for 24 ± 2 hours.
5. Mix and streak 3 mm loopful (10 µL) of sample from both broths onto Bismuth Sulfite Agar, Xylose Lysine Desoxycholate Agar, Hektoen Enteric Agar or MacConkey Agar.
6. Examine plates for the presence of colonies that are typical for *Salmonella* spp.
7. Refer appropriate references for standard test procedures.

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Results
Refer appropriate references and procedures for interpretation of results.

Storage
Store the sealed bottle containing the dehydrated medium at 10 - 30°C. Once opened and recapped, place container in a low humidity environment at the same storage temperature. Protect from moisture and light.

Expiration
Refer to the expiration date stamped on the container. The dehydrated medium should be discarded if not free flowing, or if the appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure
1. For identification, organisms must be in pure culture. Morphological, biochemical and/or serological tests should be performed for final identification.
2. Consult appropriate texts for detailed information and recommended procedures.

Packaging
Product Name : Selenite Cystine Broth w/o selenite
Product Code : DM485
Available Pack sizes : 100gm / 500gm

References

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11. Murray P. R., Baron E. J., Jorgensen J. H., Pfaller M. A., Yolken R. H., (Eds.), 8th Ed., 2003, Manual of Clinical Microbiology, ASM, Washington, D.C.
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Further Information
For further information please contact your local MICROMASTER Representative.

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DM485PSS,QAD/FR/024,Rev.00/01.01.2018

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