Selenite F Broth (Twin Pack)

M025S

Recommended is used as an enrichment medium for isolation of *Shigella* from food samples. It is recommended by BIS Committee under the specifications IS 5887 (Part III) -1999.

Composition**

Ingredients	Gms / Litre
Part A	-
Peptone	5.000
Lactose	4.000
Sodium dihydrogen phosphate	0.500
Disodium hydrogen phosphate	9.500
Part B	-
Sodium acid selenite(Sodium hydrogen selenite)	4.000
Final pH (at 25°C)	7.1±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 4.0 grams of Part B in 1000 ml distilled water. Add 19.0 grams of Part A. Mix well. Warm to dissolve the medium completely. Distribute in sterile test tubes. Sterilize in a boiling water bath or free flowing steam for 30 minutes. DO NOT AUTOCLAVE. 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 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.

Principle And Interpretation

Selective inhibitory effects of selenite were first demonstrated by Klett (1). Guth (2) used it to isolate *Salmonella* Typhi. Leifson studied selenite and formulated a medium using selenite. Fluid Selenite Cystine Medium is a modification of Leifsons (3) formula with added cystine (4). The formulation corresponds to that recommended by AOAC (5) for the detection of Salmonella in foodstuff, particularly egg products. It is also recommended by APHA (6, 7) and USP (8).This medium is recommended by ISO Committee (11) and BIS (12). 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 (9). *Salmonella* are also injured during various food processing procedures, including exposure to low temperatures, sub-marginal heat, drying, radiation, preservatives or sanitizers. Recovery of *Salmonella* involves pre-enrichment, selective enrichment and selective plating since *Salmonella* may be present in low numbers in food sample in a injured conditions. 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.

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 lessens 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 (10).

Inoculate the food sample into recommended pre-enrichment broth, and then transfer 1 ml of mixture to 10 ml of Fluid Selenite Cystine Medium and also to 10 ml Tetrathionate Broth (M032). Incubate and subsequently subculture on to Bismuth Sulphite Agar (M027), Xylose-Lysine-Deoxycholate Agar (M031), Hektoen Enteric Agar (M467) or MacConkey Agar (M081).

Quality Control

Appearance of Part A
Part A : Cream to yellow homogeneous free flowing powder

Appearance of Part B
Part B : White to cream homogeneous free flowing powder

Colour and Clarity of prepared medium
Light yellow coloured, clear to slightly opalescent solution of complete medium

Reaction
Reaction of medium [(1.9% w/v) Part A and (0.4% w/v) Part B] at 25°C. pH : 7.1±0.2

pH
6.90-7.30

Cultural Response
Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours when sub cultured on MacConkey Agar (M081).

Cultural Response

Organism	Inoculum (CFU)	Recovery	Colour of Colony
Cultural Response			
Escherichia coli ATCC 25922	50-100	little-none(no increase in numbers)	pink with bile precipitate
Salmonella Choleraesuis ATCC 12011	50-100	luxuriant	colourless
Salmonella Typhimurium ATCC 14028	50-100	luxuriant	colourless
Salmonella Typhi ATCC 6539	50-100	luxuriant	colourless
Escherichia coli NCTC 9002	50-100	little-none (no increase in numbers)	pink with bile precipitate
Escherichia coli ATCC 8739	50-100	little-none (no increase in numbers)	pink with bile precipitate
Shigella flexneri ATCC 12022	50-100	Good	colourless
Shigella sonneii ATCC 29930	50-100	Good	colourless

Storage and Shelf Life
Store below 30°C in a tightly closed container and the prepared medium at 2 - 8°C. Use before expiry date on the label.

Reference
1. Klett A., 1900, Zeitsch Fer Hyg. Und. Infekt., 33: 137.
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7. Wehr H. M. and Frank J. H., 2004, Standard Methods for the Microbiological Examination of Dairy Products, 17th Ed., APHA Inc., Washington, D.C.
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10. Chattopadhyay W. and Pilford J. N., 1976, Med. Lab. Sci., 33:191.11. Hartman P. A. and S. A., Munich, 1981, J. Food Pract., 44: 385-386
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