Fluid Selenite Cystine- Medium (Twin Pack)

MU025

Fluid Selenite Cystine Medium is used as an enrichment medium for isolation of Salmonellae in foods, dairy products and materials of sanitary importance and clinical specimens in accordance to United States Pharmacopoeia.

Composition**

Ingredients	Gms / Litre
Part A	-
Pancreatic digest of casein	5.000
Lactose	4.000
Sodium phosphate	10.000
L-Cystine	0.010
Part B	-
Sodium acid selenite	4.000
Final pH (at 25°C)	7.0±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 4.0 grams of Part B in 1000 ml purified/distilled water. Add 19.01 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 10 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 acid 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. Fluid Selenite Cystine Medium is a modification of Leifsons (3) formula with added cystine by North and Bartram(4). The formulation corresponds to that of recommended by the AOAC (5) for the detection of Salmonellae in foodstuff particularly egg products. It is included by APHA (6,7), USP (8). Recently ISO Committee also recommends this medium for the detection of Salmonellae (9). Selenite Cystine Broth is useful for detecting *Salmonella* in the nonacute stages of illness when organisms occur in low numbers in test samples and for epidemiological studies to enhance the detection of low numbers of organisms from asymptomatic or convalescent patients (10).

Pancreatic digest of casein provide nitrogenous substances. Lactose is the fermentable source of carbohydrate and also 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 that maintain a neutral pH counters this. Phosphate too maintains a stable pH and is a good buffering agent. L-cystine imparts ambient redox potential, which enhances and improves recovery of Salmonellae and few *Shigella* sp which may be in small numbers in products to be tested. This medium to some extent prevents the growth of coliforms.

Enriched broth is sub cultured on solid medium. Do not incubate the broth longer than 24 hours as inhibitory effect of selenite reduces after 6 - 12 hours of incubation (11).

Quality Control

Appearance

Cream to light yellow homogeneous free flowing powder Part B : Offwhite - white homogeneous free flowing powder

Colour and Clarity of prepared medium

Light yellow clear to slightly opalescent solution

Reaction

Reaction of medium [(1.9% w/v) Part A and (0.4% w/v) Part B]. pH : 7.0±0.2

pH
6.80-7.20

Growth Promotion Test
As per United States Pharmacopoeia

Cultural Response
Cultural characteristics observed after enrichment in MU025 for 18-24 hours, and then subcultured on Xylose Lysine Deoxycholate Agar(MU031) and Brilliant Green, Phenol red, lactose monohydrate Sucrose Agar(MU016) and incubated at 35-37°C for 18-48hours.

Cultural Response

Organism	Inoculum (CFU)	Growth	Observed Lot value (CFU)	Recovery	Colour of Colony	Incubation period
Growth on Agar Medium L						
Salmonella Typhimurium ATCC 14028	50 -100	luxuriant	25 -100	>=50 %	pinkish white	24 -48 hrs
Salmonella Abony NCTC 6017	50 -100	luxuriant	25 -100	>=50 %	pinkish white	24 -48 hrs
Growth on Agar Medium K						
Salmonella Enteritidis ATCC 13076	50 -100	luxuriant	25 -100	>=50 %	red with black centres	18 -24 hrs
Salmonella Typhimurium ATCC 14028	50 -100	luxuriant	25 -100	>=50 %	red with black centres	18 -24 hrs
Salmonella Abony NCTC 6017	50 -100	good-luxuriant	25 -100	>=50 %	red with black centres	18 -24 hrs
Salmonella Typhi ATCC 6539	50 -100	good-luxuriant	25 -100	>=50 %	red w/ black centres	18 -24 hrs
Escherichia coli ATCC 8739	50 -100	fair	10 -30	20 -30 %	yellow	18 -24 hrs
Escherichia coli ATCC 25922	50 -100	fair	10 -30	20 -30 %	yellowish green	18 -24 hrs
Escherichia coli NCTC 9002	50 -100	fair	10 -30	20 -30 %	yellowish green	24 -48 hrs
Growth on Agar Medium L						
Salmonella Enteritidis ATCC 13076	50 -100	luxuriant	25 -100	>=50 %	pinkish white	24 -48 hrs
Salmonella Typhi ATCC 6539	50 -100	fair-good	15 -40	30-40 %	reddish	24 -48 hrs
Escherichia coli ATCC 8739	50 -100	fair	10 -30	20 -30 %	yellowish green	24 -48 hrs

Storage and Shelf Life
Store below 30°C 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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5. AOAC, 2005, Bacteriological Analytical Manual, 18th ed., AOAC, Washington, DC.
6. Downes F P and Ito K(Eds.), 2001, Compendium of Methods For The Microbiological Examination of Foods, 4th ed., APHA, Washington, D.C.
7. Wehr H M and Frank J H., 2004, Standard Methods for the Examination of Dairy Products, 17th ed., APHA Inc., Washington, D.C.
8. United States Pharmacopoeia, 2009 U.S. Pharmacopoeial Convention, Inc., Rockville, MD.
9. International Organization for Standardization (ISO), 1993, Draft ISO/DIS 6579
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11. Chattopadhyay W. and Pilford J. N., 1976, Med. Lab. Sci., 33:191.

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