Dehydrated Culture Media
Bases / Media Supplements

Technical Information

Fluid Selenite Cystine Medium (Selenite Cystine Medium) (Twin Pack)

Product Code: DM 1025

Application: - Fluid Selenite Cystine Medium is used as an enrichment medium for isolation of Salmonellae from foods, dairy products, materials of sanitary importance and clinical specimens.

Composition**

Ingredients	Gms / Litre
Part A	-
Casein enzymic hydrolysate	5.000
Lactose	4.000
Sodium phosphate	10.000
L-Cystine	0.010
Part B	-
Sodium hydrogen selenite	4.000
Final pH (at 25°C)	7.0±0.2

**Formula adjusted, standardized to suit performance parameters

Principle & 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 is similar 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]. Selenite Cystine Broth is useful for detecting Salmonella in the non-acute stages of illness when organisms in the faeces are present 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, such as exposure to low temperatures, sub-marginal heat, drying, radiation, preservatives or sanitizers, [11]. Recovery of Salmonella involves pre-enrichment, selective enrichment and selective plating since when present in low numbers in food sample and 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 make ten fold dilution dilution of mixture using Fluid Selenite Cystine Medium and also to 10 ml Tetrathionate Broth (DM1032). Incubate and subsequently subculture on to Bismuth Sulphite Agar (DM1027), Xylose-Lysine-Deoxycholate Agar (DM1031), Hektoen Enteric Agar (DM1467) or MacConkey Agar (DM1081).

Methodology

Suspend 4 grams of Part B media in 1000 ml distilled water. Add 19.01 grams of Part A. media 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 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.

Quality Control

Physical Appearance
Part A :Cream to yellow homogeneous free flowing powder 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 : 7.0±0.2

pH range 6.80-7.20

Cultural Response/ characteristices
DM 1025: Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours when sub cultured on MacConkey Agar (DM1081).

Organism	Inoculum (CFU)	Recovery	Colour of colony
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
Enterococcus faecalis ATCC	>=10^4	Inhibited	-

Storage and Shelf Life

Dried Media: Store below 30°C in tightly closed container and use before expiry date as mentioned on the label.
Prepared Media: 2-8° in sealable plastic bags for 2-5 days.

Further Reading

1. Klett A., 1900, Zeitsch Fer Hyg. Und. Infekt., 33: 137.
2. Guth F., 1916, Zbl. Bakt. I. Orig., 77:487.
3. Leifson E., 1936, Am. J. Hyg., 24(2): 423.
4. North W. R. and Bartram M. T., 1953, Appl. Microbiol., 1:130.
5. FDA Bacteriological Analytical Manual, 2005, 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 Microbiological Examination of Dairy Products, 17th Ed., APHA Inc., Washington, D.C.
8. The United States Pharmacopeia, 2006, USP29/NF24, The United States Pharmacopeial Convention, Rockville, M. D.
9. 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.
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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