



Fluid Tetrathionate Medium

MU032

Fluid Tetrathionate Medium in combination with added iodine and brilliant green is recommended as an enrichment broth for isolation of Salmonellae from specimens suspected to be contaminated with Salmonellae in accordance with United States Pharmacopoeia.

Composition**

Ingredients	Gms / Litre
Pancreatic digest of casein	2.500
Peptic digest of animal tissue	2.500
Bile salts	1.000
Calcium carbonate	10.000
Sodium thiosulphate	30.000

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 46 grams in 970 ml purified/ distilled water and heat just to boiling. DO NOT AUTOCLAVE. Cool to 45-50°C. On the day of use add 20 ml iodine solution (iodine - 6 grams and potassium iodide - 5 grams in 20 ml distilled water) and 10 ml of 0.1% brilliant green solution. Mix well and dispense in 10 ml quantities.

Do not heat after the addition of iodine solution. Use the medium immediately after addition of iodine.

Note : Due to presence of calcium carbonate, the prepared medium forms opalescent solution with a white precipitate .

Principle And Interpretation

Fluid Tetrathionate Medium was originally described by Mueller (1) and found that the medium selectively inhibit coliforms and permit unrestricted growth of enteric pathogens. The medium is now formulated according to FDA (2), United States Pharmacopoeia, 2009 (3), Compendium of Microbiological Examination of Foods (4) and Standard Methods for the Examination of Water and Wastewater (5) which specify this medium as enrichment medium for *Salmonella* species. *Salmonella* is the common causative agent of mild gastroenteritis to typhoid. It is common contaminant in food and other biological products. This medium supports the rejuvenation of *Salmonella* cells injured by food processing which are incapable of forming colonies on plate, but on injection can cause infection. This medium is recommended by USP for microbial limit tests for pharmaceutical preparations

Bile salts inhibit gram-positive microorganisms. The selectivity depends on the ability of thiosulphate and tetrathionate(formed by addition of Iodine and Potassium iodide) in combination to suppress commensal coliform organisms (6,7). The microorganism harbouring tetrathionate reductase flourish in this broth. Sodium thiosulphate forms the substrate for enzyme thiosulphate reductase. Sodium thiosulphates are also inactivators of halogens and can minimize its toxicity in the testing sample, if any during microbial limit tests. Pancreatic digest of casein and peptic digest of animal tissues supplies essential nutrients and vitamins in this medium. Calcium carbonate neutralizes the acidic tetrathionate decomposition products. Sodium chloride maintains osmotic balance.

For further confirmation, streak the enriched cultures after incubation, on the plates of Brilliant Green Agar (MU016), MacConkey Agar (MU081), Bismuth Sulphite Agar (MU027).

Quality Control

Appearance

White to cream homogeneous free flowing powder

Colour and Clarity of prepared medium

Complete medium with added brilliant green and iodine solution - Light green coloured opalescent solution with white precipitate, on standing the precipitate settles down.

Growth Promotion Test

As per United States Pharmacopoeia.

Cultural Response

Cultural characteristics observed with added brilliant green and iodine solution, after an incubation at 35-37°C for 18-24 hours, when sub cultured on MacConkey Agar (MU081) after enrichment in Tetrathionate medium.

Cultural Response

Organism	Inoculum (CFU)	Recovery	Colour of colony
Cultural Response			
<i>Salmonella Abony</i> NCTC 6017	50-100	good-luxuriant	colourless
<i>Salmonella Typhimurium</i> ATCC 14028	50-100	good-luxuriant	colourless
<i>Salmonella Typhi</i> ATCC 6539	50-100	good-luxuriant	colourless
<i>Escherichia coli</i> ATCC 8739	50-100	little or no increase in numbers	white to pink with bile precipitate

Storage and Shelf Life

Store below 30°C and the base broth at 2 - 8°C. Use before expiry date on the label.

Reference

- Mueller, 1923, Compt. Rend. Sco. Biol., 89:434.
- Bacteriological Analytical Manual, 8th Edition, Revision A, 1998. AOAC, Washington D.C.
- The United States Pharmacopoeia, 2009, US Pharmacopoeial Convention, Inc., Rockville, MD.
- Downes F P and Ito K(Eds.), 2001, Compendium of Methods For The Microbiological Examination of Foods, 4th ed., APHA, Washington, D.C. .
- Eaton A. D., Clesceri L. S. and Greenberg A W.,(Eds.), 2005, Standard Methods for the Examination of Water and Wastewater, 21st ed., APHA, Washington, D.C.
- Pollock M.R. and Knor R., 1943, Biochem J., 37:476.
- MacFaddin J., 1985, Media for Isolation-Cultivation-Identification-Maintenance of Medical Bacteria., Vol. 1, Williams and Wilkins, Baltimore.

Revision : 2 / 2014

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