Tetrathionate Broth, Base

For the selective enrichment of salmonellae from various materials.

This broth complies with the specifications given in the United States Pharmacopeia XXVI (2003) and the recommendations of the APHA (1992).

Mode of Action

Tetrathionate and excess thiosulfate (PALUMBO and ALFORD 1970) suppress coliform microorganisms and other accompanying bacteria, whereas all tetrathionate-reducing bacteria (e.g. salmonellae and Proteus) can multiply more or less normally in this medium. Acidic tetrathionate decomposition products are formed, which are neutralized by calcium carbonate

Bile salts largely inhibit all microorganisms, which do not normally live in the intestine. The United States Pharmacopeia recommends the addition of brilliant green, which suppresses, above all, the Gram-positive microbial flora. The resulting culture medium has a very strong inhibitory effect; it is therefore sometimes better to omit the brilliant green in order to obtain satisfactory yields of salmonellae. According to JEFFRIES (1959), Proteus can be suppressed by adding 0.04 g novobiocin/litre.

Typical Composition (g/litre)

Peptone from casein 2.5; peptone from meat 2.5; bile salt mixture 1.0; calcium carbonate 10.0; sodium thiosulfate 30.0.

Also to be added:

Potassium iodide 5.0; iodine 6.0; if required brilliant green 0.01.

Preparation

Suspend 46 g/litre, heat briefly to the boil and cool rapidly.

- **Do not autoclave.**

Prior to use, add 20 ml iodine/potassium iodide solution/litre, if desired 10 ml of a 0.1 % brilliant green solution/litre and if required 0.04 g novobiocin/litre. Avoid any further heating. When dispensing the prepared medium, make sure that any precipitate formed is evenly suspended.

Preparation of the iodine/potassium iodide solution: Iodine 6 g; potassium iodide 5 g; distilled water 20 ml.

- **The ready-to-use broth should be prepared and used the same day.**

The medium is turbid and green with white sediment (calcium carbonate).

Experimental Procedure and Evaluation

Inoculate the culture medium massively with the sample material.

Incubation: 18-24 hours at 35-37 °C or 43 °C respectively (BÄNFFER 1971).

The resulting cultures are then subjected to further tests.

Literature

American Public Health Association: Compendium of methods for the microbiological examination of foods. – 3rd ed. (1992).

BÄNFFER, J.R.: Comparison of the isolation of Salmonellae from human faeces by enrichment at 37 °C and 43 °C. - **Zbl. Bakt. I. Orig., 217**; 35-40 (1971).

JEFFRIES, L.: Novobiocin - tetrathionate broth: A medium of improved selectivity for the isolation of salmonellae from faeces. - **J. Clin. Path., 12**; 568-571 (1959).

KNOX, R., POLLOCK, M.R., a. GELL, F.G.H.: The selective action of tetrathionate in bacteriological media. - **J. Hyg., 43**; 147-158 (1943).

PALUMBO, S., a. ALFORD, J.: Inhibitory action of tetrathionate enrichment broth. - **Appl. Microbiol., 20**; 970-976 (1970).

United States Pharmacopeia XXIII, Chapter "Microbiol Limit Tests", 1995.

Ordering Information

Product	Merck Cat. No.	Pack size
Tetrathionate Broth, Base	1.05285.0500	500 g
Brilliant green (C.I. 42040)	1.01310.0050	50 g
Iodine resublimed	1.04761.0100	100 g
Potassium iodide	1.05043.0250	250 g
Novobiocin monosodium salt	CN Biosciences	

Quality control

Test strains	Inoculum	Growth after 24 hours
Escherichia coli ATCC 25922	approx. 99 %	≤ 5 %
Salmonella typhimurium ATCC 14028	approx. 1 %	≥ 95 %