Kauffman Muller's Tetrathionate Broth Base

Kauffman Muller's Tetrathionate Broth Base is recommended as selective enrichment medium for isolation of *Shigella* species from food samples. It is recommended by BIS committee under the specifications IS:5887(Part I)-1999.

**Composition**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Gms / Litre</th>
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<tbody>
<tr>
<td>Peptone</td>
<td>9.000</td>
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<tr>
<td>Meat extract</td>
<td>9.000</td>
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<tr>
<td>Sodium chloride</td>
<td>4.500</td>
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<tr>
<td>Calcium carbonate</td>
<td>50.000</td>
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<tr>
<td>Sodium thiosulphate</td>
<td>50.000</td>
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<tr>
<td>Oxbile</td>
<td>10.000</td>
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**Formula adjusted, standardized to suit performance parameters**

**Directions**

Suspend 132.5 grams in 1000 ml distilled water. Heat just to boiling to dissolve the medium. **DO NOT AUTOCLAVE.**

Cool and just before use aseptically add 20 ml of iodine solution (4 gram iodine and 5 gram Potassium iodide in 20 ml sterile distilled water) and 10 ml of 0.1 % Brilliant green solution. Mix well before dispensing in the sterile tubes to disperse Calcium carbonate uniformly.

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

**Principle And Interpretation**

*Salmonella* species cause many types of infections, from mild self-limiting gastroenteritis to life-threatening typhoid fever (1). *Salmonella* present in food samples may also be injured in food-processing procedures, which include exposure to low temperatures, sub-marginal heat, drying, radiation, preservative, and sanitizers (2). This medium is hence used as a selective enrichment for the cultivation of *Salmonella* species that may be present in small numbers and have been injured through various procedures.

Muller recommended Tetrathionate Broth as a selective medium for the recovery of *Salmonella* and demonstrated the effectiveness of Tetrathionate Broth(3) for enriching typhoid and paratyphoid bacilli while inhibiting coliform organisms. Kauffmann modified this formula to include Oxbile (4,5) for its selective properties, which suppresses coliform bacteria and inhibits Gram-positive organisms. Using modified Muller's broth, Kauffmann increased the number of rapid screening of *Salmonella* in food(6,7). Meat Peptone provides nitrogen, carbon, vitamins, and amino acids. Sodium Chloride maintains the osmotic balance of the medium. Calcium Carbonate neutralizes and absorbs toxic metabolites. Selectivity is accomplished by the combination of Sodium Thiosulfate and tetrathionate, which suppresses commensal intestinal organisms (8). The British Standard Specification specifies Brilliant Green Tetrathionate Broth for isolating *Salmonella* from meat and meat products and from poultry and poultry products. Muller Kauffmann Tetrathionate Broth Base conforms with ISO Standards (9).

**Quality Control**

**Appearance**

Cream to yellow homogeneous free flowing powder

**Colour and Clarity of prepared medium**

With added brilliant green and iodine solution - Light green coloured opalescent solution forms with heavy white precipitate

**Cultural Response**

Cultural characteristics observed, when subcultured on Soyabean Casein digest Agar, after an incubation at 43°C for 18-24 hours with added iodine and brilliant green solution.
Organism | Inoculum (CFU) | Recovery
--- | --- | ---
**Cultural Response**
Salmonella Typhimurium ATCC 14028 | 50-100 | excellent
Salmonella Enteritidis ATCC 13076 | 50-100 | excellent
Salmonella Paratyphi A | 50-100 | excellent
Salmonella Paratyphi B | 50-100 | excellent
Salmonella Typhi ATCC 6539 | >=10³ | inhibited
Escherichia coli ATCC 25922 | 50-100 | none-poor
Proteus vulgaris ATCC 13315 | 50-100 | none-poor
Shigella flexneri ATCC 12022 | 50-100 | Good

**Storage and Shelf Life**
Store below 30°C in tightly closed container and use the freshly prepared medium. Use before expiry date on the label.

**Reference**

Revision: 2 / 2015

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