Koser Citrate Medium

**Intended Use:**
Recommended to differentiate *Escherichia coli* and *Enterobacter aerogenes* on the basis of citrate utilization.

**Composition**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Gms / Litre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium ammonium phosphate</td>
<td>1.500</td>
</tr>
<tr>
<td>Potassium dihydrogen phosphate</td>
<td>1.000</td>
</tr>
<tr>
<td>Magnesium sulphate</td>
<td>0.200</td>
</tr>
<tr>
<td>Sodium citrate</td>
<td>3.000</td>
</tr>
<tr>
<td>Final pH (at 25°C)</td>
<td>6.7±0.2</td>
</tr>
</tbody>
</table>

**Formula adjusted, standardized to suit performance parameters**

**Directions**
Suspend 5.7 grams in 1000 ml purified / distilled water. Dispense into tubes and sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 45-50°C.

**Principle And Interpretation**
Coliform bacteria serve as bacterial indicators of sanitary quality of food and water. These bacteria are normally found in the intestinal tract of humans and many warm-blooded animals (1). Coliforms encompasses mostly of *Enterobacteriaceae* from the genera *Enterobacter, Klebsiella, Escherichia, and Citrobacter*. The characteristics of the members of *Enterobacteriaceae* are that they are gram-negative rods and ferment glucose to form acid along with gas production (7). Two important members of the *Enterobacteriaceae* family are *Escherichia coli* and *Enterobacter aerogenes*. Both can be differentiated on the basis of IMViC test. *Enterobacter* species are able to utilize sodium citrate as the sole carbon source while *E. coli* fail to do so. This property is used to differentiate the coli-aerogenes group (6). Koser Citrate Medium is used as a base for studying citrate utilization tests. This medium is recommended by APHA, and others, to presumptively identify coliforms encountered in the food and dairy industry (6,8,9,10,11).

The various salts used serve as source of carbon and nitrogen to the organisms. Citric acid or its sodium salt is utilized as a sole source of carbon and ammonium salt as the sole source of nitrogen by *E. aerogenes* while *E. coli* does not utilize these salts and hence fail to grow. Koser Citrate Medium may be used in place of Simmon Citrate Agar (M099). Inoculating into Koser Citrate Medium further identifies coli-like colonies from Endo or EMB Agar plates. After 24-48 hours incubation, tubes showing marked turbidity may be assumed to contain organisms from aerogenes group and if the medium remains clear it may be considered as coli. Presumptive positive organisms identified on this medium should be further confirmed by performing the biochemical tests.

**Type of specimen**
Clinical samples - Faeces; Food and dairy samples; Water samples

**Specimen Collection and Handling:**
For clinical samples follow appropriate techniques for handling specimens as per established guidelines (4,5).
For food and dairy samples, follow appropriate techniques for sample collection and processing as per guidelines (2,8,10).
For water samples, follow appropriate techniques for sample collection, processing as per guidelines and local standards (3).
After use, contaminated materials must be sterilized by autoclaving before discarding.

**Warning and Precautions:**
In vitro diagnostic Use. Read the label before opening the container. Wear protective gloves/protective clothing/eye protection/ face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling clinical specimens. Safety guidelines may be referred in individual safety data sheets.

Please refer disclaimer Overleaf.
Limitations:
1. The pH affects the performance of the medium and must be correctly monitored.

Performance and Evaluation
Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature.

Quality Control
Appearance
White to cream homogeneous free flowing powder

Colour and Clarity of prepared medium
Colourless, clear solution without any precipitate

Reaction
Reaction of 0.57 w/v aqueous solution at 25°C. pH : 6.7±0.2

pH
6.50-6.90

Cultural Response
Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours.

<table>
<thead>
<tr>
<th>Organism</th>
<th>Inoculum (CFU)</th>
<th>Growth</th>
<th>Citrate Utilisation</th>
</tr>
</thead>
<tbody>
<tr>
<td># Klebsiella aerogenes</td>
<td>50-100</td>
<td>luxuriantpositive reaction, turbidity</td>
<td></td>
</tr>
<tr>
<td>ATCC 13048 (00175*)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Enterobacter cloacae ATCC 23355</td>
<td>50-100</td>
<td>luxuriantpositive reaction, turbidity</td>
<td></td>
</tr>
<tr>
<td>Escherichia coli ATCC 25922 (00013*)</td>
<td>50-100</td>
<td>none-poornegative reaction, no turbidity</td>
<td></td>
</tr>
<tr>
<td>Klebsiella pneumoniae ATCC 13883 (00097*)</td>
<td>50-100</td>
<td>luxuriantpositive reaction, turbidity</td>
<td></td>
</tr>
</tbody>
</table>

Key : * Corresponding WDCM numbers.
# Formerly known as Enterobacter aerogenes

Storage and Shelf Life
Store between 10-30°C in a tightly closed container and the prepared medium at 20-30°C. Use before expiry date on the label. On opening, product should be properly stored dry, after tightly capping the bottle in order to prevent lump formation due to the hygroscopic nature of the product. Improper storage of the product may lead to lump formation. Store in dry ventilated area protected from extremes of temperature and sources of ignition. Seal the container tightly after use. Product performance is best if used within stated expiry period.

Disposal
User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with clinical sample must be decontaminated and disposed of in accordance with current laboratory techniques (4,5).

Reference


Revision: 02/2019

In vitro diagnostic medical device

CE Marking

Storage temperature

10°C – 30°C

Do not use if package is damaged

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Disclaimer:

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