Cellobiose Arginine Lysine Broth (CAL Broth)  

**Intended Use:**
Recommended for isolation and biochemical characterization of *Yersinia enterocolitica*.

**Composition**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Gms / Litre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yeast extract</td>
<td>3.000</td>
</tr>
<tr>
<td>Sodium chloride</td>
<td>5.000</td>
</tr>
<tr>
<td>Cellobiose</td>
<td>3.500</td>
</tr>
<tr>
<td>L-Arginine</td>
<td>6.500</td>
</tr>
<tr>
<td>L-Lysine hydrochloride</td>
<td>6.500</td>
</tr>
<tr>
<td>Sodium deoxycholate</td>
<td>1.500</td>
</tr>
<tr>
<td>Neutral red</td>
<td>0.030</td>
</tr>
<tr>
<td>Final pH ( at 25°C)</td>
<td>7.1±0.2</td>
</tr>
</tbody>
</table>

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

**Directions**
Suspend 26.03 grams in 1000 ml purified / distilled water. Heat if necessary to dissolve the medium completely. DO NOT OVERHEAT OR AUTOCLAVE. Cool to 45-50°C. Mix well and dispense into sterile test tubes.

**Principle And Interpretation**

*Yersinia enterocolitica* is a significant invasive enteric pathogen belonging to the family *Enterobacteriaceae*, which causes several well-recognized diseases especially in younger persons and several uncommon post-infection syndrome.

Enterocolitis caused by *Y. enterocolitica* is characterized by diarrhea, low fever and abdominal pain. CAL Broth used for selective isolation of *Y. enterocolitica* was originally formulated by Dudley and Shotts (2).

CAL Broth is a differential medium as it differentiates *Yersinia* on the basis of cellobiose fermentation and lysine or arginine decarboxylation. As the organism is biochemically similar to other *Enterobacteriaceae*. CAL Broth is used for the enumeration of *Y. enterocolitica* from water and other liquid specimens (5).

Yeast extract provides essential nutrients to the organisms. Cellobiose is the fermentable carbohydrate. Sodium chloride maintains the osmotic equilibrium. Sodium deoxycholate makes the medium selective by inhibiting the accompanying gram-positive bacteria, which may cause contamination during cultivation. L-arginine and L-lysine are the amino acids, decarboxylation of which makes the medium differential. Neutral red is the indicator, which turns red under acidic conditions (1).

**Type of specimen**
Clinical samples - faeces; Food and dairy samples

**Specimen Collection and Handling:**
For clinical samples follow appropriate techniques for handling specimens as per established guidelines (3,4).

For food and dairy samples, follow appropriate techniques for sample collection and processing as per guidelines (6,7).

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.

**Limitations:**
1. Individual organisms differ in their growth requirement and may show variable growth patterns on the medium.
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
Light yellow to pink homogeneous free flowing powder

Colour and Clarity of prepared medium
Red coloured, clear solution in tubes

Reaction
Reaction of 2.6% w/v aqueous solution at 25°C. pH : 7.1±0.2

pH
6.90-7.30

Cultural Response
Cultural characteristics observed after an incubation at 35-37°C for 18-48 hours.

<table>
<thead>
<tr>
<th>Organism</th>
<th>Inoculum (CFU)</th>
<th>Growth</th>
<th>Cellobiose</th>
<th>Arginine decarboxylation</th>
<th>Lysine decarboxylation</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Escherichia coli</em> ATCC 25922</td>
<td>50-100</td>
<td>good</td>
<td>negative</td>
<td>variable reaction</td>
<td>variable reaction</td>
</tr>
<tr>
<td><em>Proteus mirabilis</em> ATCC 25933</td>
<td>50-100</td>
<td>good</td>
<td>negative</td>
<td>variable reaction</td>
<td>variable reaction</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em> ATCC 27853 (00025*)</td>
<td>50-100</td>
<td>good</td>
<td>negative</td>
<td>negative reaction</td>
<td>positive reaction</td>
</tr>
<tr>
<td><em>Yersinia enterocolitica</em> ATCC 27729</td>
<td>50-100</td>
<td>good-luxuriant</td>
<td>positive reaction</td>
<td>negative reaction</td>
<td>reaction</td>
</tr>
</tbody>
</table>

Key : *Corresponding WDCM numbers.

Storage and Shelf Life
Store between 10-30°C in a tightly closed container and the prepared medium at 15-25°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 (3,4).

Reference

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In vitro diagnostic medical device

CE Marking

Storage temperature

10°C-30°C

Do not use if package is damaged

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