A-1 MEDIUM (7601)

**Intended Use**
A-1 Medium is used for the detection of coliform organisms in water and food in a laboratory setting. A-1 Medium is not intended for use in the diagnosis of disease or other conditions in humans.

**Product Summary and Explanation**
Since the early 1900’s enumeration of coliform organisms, specifically *E. coli*, have been used to determine water purity. Elevated temperature and most-probable-number (MPN) methods are routinely used for analysis of water and food samples for presence of fecal coliforms. A-1 Medium was formulated to hasten *E. coli* recovery and reduce the incidence of false positive cultures.

In 1972 Andrews and Presnell developed A-1 Medium. This medium recovers *E. coli* from estuarine water in 24 hours instead of 72 hours, and in greater numbers without the pre-enrichment step. A-1 Medium can be used in a single step procedure for the detection of fecal coliforms in source water, seawater, treated wastewater, and foods. A-1 Medium conforms to standard methods for the isolation of fecal coliforms in water and foods.

**Principles of the Procedure**
Enzymatic Digest of Casein provides sources of nitrogen, amino acids, and vitamins in A-1 Medium. Lactose is the carbon source, and in combination with Salicin, provides energy for organism growth. Sodium Chloride maintains the osmotic balance of the medium. Triton X-100 is a surfactant.

**Formula / Liter**
<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enzymatic Digest of Casein</td>
<td>20 g</td>
</tr>
<tr>
<td>Lactose</td>
<td>5 g</td>
</tr>
<tr>
<td>Sodium Chloride</td>
<td>5 g</td>
</tr>
<tr>
<td>Salicin</td>
<td>0.5 g</td>
</tr>
<tr>
<td>Triton X-100</td>
<td>1 g</td>
</tr>
</tbody>
</table>

Final pH: 6.9 ± 0.2 at 25°C
Formula may be adjusted and/or supplemented as required to meet performance specifications.

**Precautions**
1. For Laboratory Use Only.
2. IRRITANT. Irritating to eyes, skin, and respiratory system.

**Directions**
1. Dissolve 31.5 g of the medium in one liter of purified water.
2. Heat with frequent agitation to completely dissolve the medium.
3. Distribute into test tubes containing Durham tubes and autoclave at 121°C for 10 minutes.
4. Autoclave at 121°C for 10 minutes.

**Quality Control Specifications**
Dehydrated Appearance: Powder is homogeneous, free-flowing, forms soft lumps, and light beige to beige.

Prepared Appearance: Prepared medium is clear, may have a light precipitate, and light yellow to amber.
Expected Cultural Response: Cultural response in A-1 Medium were incubated aerobically at 35 ± 2°C for 3 hours and then examined for growth following transfer to a 44.5°C waterbath for 19 – 22 hours.

<table>
<thead>
<tr>
<th>Microorganism</th>
<th>Approx. Inoculum (CFU)</th>
<th>Expected Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Escherichia coli</em> ATCC® 25922</td>
<td>10 - 300</td>
<td>Growth +</td>
</tr>
<tr>
<td><em>Escherichia coli</em> ATCC® 35218</td>
<td>10 - 300</td>
<td>Growth +</td>
</tr>
<tr>
<td><em>Proteus mirabilis</em> ATCC® 12453</td>
<td>10 - 300</td>
<td>Growth -</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em> ATCC® 27853</td>
<td>~ 1000</td>
<td>Partial to complete inhibition -</td>
</tr>
</tbody>
</table>

The organisms listed are the minimum that should be used for quality control testing.

Test Procedure
1. Inoculate tubes of A-1 Medium as directed in standard methods.\(^3\)^\(^5\)
2. Incubate at 35 ± 0.5°C for 3 hours.
3. Transfer tubes to a water bath at 44.5 ± 0.2°C and incubate for an additional 21 ± 2 hours.
4. Maintain water level in bath above level of liquid in inoculated tubes.

Results
Gas production in the inverted vial, or dissolved gas that forms fine bubbles when slightly agitated, is a positive reaction indicating the presence of fecal coliforms. For MPN, calculate fecal coliform densities using tables from standard methods.

Storage
Store sealed bottle containing the dehydrated medium at 2 - 30°C. Once opened and recapped, place container in a low humidity environment at the same storage temperature. Protect from moisture and light by keeping container tightly closed.

Expiration
Refer to expiration date stamped on the container. The dehydrated medium should be discarded if appearance has changed from the original color and texture. Expiry applies to medium in its intact container.

Limitations of the Procedure
1. Due to nutritional variation, some strains may grow poorly or fail to grow on this medium.
2. Fecal coliform counts are usually greater than *E. coli* counts.\(^8\)
3. Interpretation of tests using A-1 Medium requires understanding of the microflora of the specimen.\(^4\)

Packaging
<table>
<thead>
<tr>
<th>A-1 Medium</th>
<th>Code No.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7601A</td>
<td>500 g</td>
</tr>
<tr>
<td></td>
<td>7601B</td>
<td>2 kg</td>
</tr>
<tr>
<td></td>
<td>7601C</td>
<td>10 kg</td>
</tr>
</tbody>
</table>

References

Technical Information
Contact Acumedia Manufacturers, Inc. for Technical Service or questions involving dehydrated culture media preparation or performance at (517)372-9200 or fax us at (517)372-2006.