



A-1 MEDIUM (7601)

Intended Use

A-1 Medium is used for the detection of coliform organisms in water and food.

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.¹ This medium recovers *E. coli* from estuarine water in 24 hours instead of 72 hours, and in greater numbers without the pre-enrichment step.² 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.³⁻⁵

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

Enzymatic Digest of Casein.....	20 g
Lactose	5 g
Sodium Chloride	5 g
Salicin	0.5 g
Triton X-100	1 g

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.
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 and boil for one minute to completely dissolve the medium.
3. Distribute into test tubes containing Durham tubes and 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 after 3 hours at 35 - 37°C and examined for growth following transfer to subsequent incubation at 44.5°C for 19 – 22 hours.

Microorganism	Response	Reactions, (Gas)
<i>Escherichia coli</i> ATCC® 25922	growth	positive (+)
<i>Escherichia coli</i> ATCC® 35218	growth	positive (+)
<i>Proteus mirabilis</i> ATCC® 12453	growth	negative (-)
<i>Pseudomonas aeruginosa</i> ATCC® 27853	inhibited	negative (-)

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 when stored as directed.

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.⁴
3. Interpretation of test procedure using A-1 Medium requires understanding of the microflora of the specimen.⁴

Packaging

A-1 Medium	Code No.	7601A	500 g
		7601B	2 kg
		7601C	10 kg

References

1. **Andrews, W. H., and M. W. Presnell.** 1972. Rapid recovery of *Escherichia coli* from estuarine water. Appl. Microbiol. **23**:521-523.
2. **Andrews, W. H., C. D. Diggs, and C. R. Wilson.** 1975. Evaluation of a medium for the rapid recovery of *Escherichia coli* from shellfish. Appl. Microbiol. **29**:130-131.
3. **Eaton, A. D., L. S. Clesceri, and A. E. Greenberg (eds.).** 1995. Standard methods for the examination of water and wastewater, 19th ed. American Public Health Association, Washington, D.C.
4. **Vanderzant, C., and D. F. Splittstoesser (eds.).** 1992. Compendium of methods for the microbiological examination of food, 3rd ed. American Public Health Association, Washington, D.C.
5. **Association of Official Analytical Chemists.** 1995. Bacteriological analytical manual, 8th ed. AOAC International, Gaithersburg, M.D.

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.