

COLUMBIA BROTH (7127)

Intended Use

Columbia Broth is used for the cultivation of a wide variety of fastidious microorganisms.

Product Summary and Explanation

Columbia Broth is prepared according to the formula described by Morello and Ellner.¹ During their study, Columbia Broth was developed as a medium for blood cultures, and found superior to a commonly used broth for growth of *Staphylococcus aureus*, *E. coli*, and streptococci.¹ In the presence of CO₂ and supplemented with SPS, Columbia Broth is an excellent blood culture medium and contains sufficient sulfonamide antagonists to prevent sulfonamide inhibition of growth.²

Principles of the Procedure

The nitrogen, vitamin, and carbon sources are provided by Enzymatic Digest of Animal Tissue, Enzymatic Digest of Casein, Enzymatic Digest of Heart Muscle, and Yeast Enriched Peptone. Sodium Chloride maintains the osmotic balance of the medium. Dextrose is added as a carbon energy source. The medium is buffered with Tris ([hydroxymethyl] aminomethane) and Sodium Carbonate. Ferrous Sulfate and Magnesium Sulfate are added to facilitate bacterial growth. Corn Starch is omitted from Columbia Broth to reduce opalescence.¹ L-Cystine is the reducing agent.

Formula / Liter

Enzymatic Digest of Casein	5 g
Enzymatic Digest of Animal Tissue.....	5 g
Yeast Enriched Peptone	10 g
Enzymatic Digest of Heart Muscle	3 g
Sodium Chloride	5 g
Dextrose.....	2.5 g
L-Cystine	0.1 g
Magnesium Sulfate	0.1 g
Ferrous Sulfate	0.02 g
Tris (hydroxymethyl) aminomethane.....	0.83 g
Tris (hydroxymethyl) aminomethane-HCl	2.86 g
Sodium Carbonate	0.6 g

Final pH 7.3 ± 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, respiratory system, and skin.

Directions

1. Dissolve 35 g of the medium in one liter of purified water.
2. Mix thoroughly.
3. Autoclave at 121°C for 15 minutes.

Quality Control Specifications

Dehydrated Appearance: Powder is homogeneous, free flowing, and beige.

Prepared Appearance: Prepared broth is gold to amber, brilliant to clear and with trace to moderate precipitate.

Expected Cultural Response: Cultural response in Columbia Broth incubated at appropriate atmosphere and temperature and examined for growth at 1 – 3 days.

Microorganism	Approx. Inoculum (CFU)	Expected Results
<i>Bacillus fragilis</i> ATCC® 25285	10 - 300	Growth
<i>Escherichia coli</i> ATCC® 25922	10 - 300	Growth
<i>Neisseria meningitidis</i> ATCC® 13090	10 - 300	Growth
<i>Streptococcus pneumoniae</i> ATCC® 6305	10 - 300	Growth
<i>Streptococcus pyogenes</i> ATCC® 19615	10 - 300	Growth

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

Test Procedure

Process each specimen as appropriate. Refer to correct references for specific procedures.^{2,3}

Results

Examine medium for growth. Gram-negative bacilli tend to grow diffusely, Gram-positive cocci exhibit puff-ball type growth, and strict aerobes, such as pseudomonads and yeast, usually grow in a thin layer on the surface of the broth.² To ensure no growth is present, subculture inoculated and incubated Columbia Broth to appropriate non-selective media.

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 not free flowing, or if appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure

1. Due to nutritional variation, some strains may be encountered that grow poorly or fail to grow on this medium.
2. Opalescence in Columbia Broth cannot always be relied upon as evidence of bacterial growth.
3. It is possible for significant number of viable bacteria to be present in an inoculated and incubated blood culture bottle without the usual signs of bacterial growth.

Packaging

Columbia Broth	Code No.	7127A	500 g
		7127B	2 kg
		7127C	10 kg

References

1. **Morello, J. A., and P. D. Ellner.** 1969. New medium for blood cultures. *Appl. Microbiol.* 17:68-07.
2. **Isenberg, H. D. (ed.).** 1992. *Clinical microbiology procedures handbook*, vol. 1 American Society for Microbiology, Washington, D.C.
3. **Murray, P. R., E. J. Baron, M. A. Pfaller, F. C. Tenover, and R. H. Tenover (eds.).** 1995. *Manual of clinical microbiology*, 6th ed. American Society of Microbiology, Washington, D.C.

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.