

BUFFERED LISTERIA ENRICHMENT BROTH (7579)

Intended Use

Buffered Listeria Enrichment Broth is used for selective enrichment of *Listeria* spp.

Product Summary and Explanation

Listeria monocytogenes, described first in 1926 by Murray, Webb, and Swann,¹ is an extensive problem in public health and food industries. This organism has the ability to cause human illness and death, particularly in immunocompromised individuals and pregnant women.² Epidemiological evidence from outbreaks of listeriosis has indicated that the principle route of transmission is via consumption of foodstuffs contaminated with *Listeria monocytogenes*.³ Implicated vehicles of transmission include turkey, frankfurters, coleslaw, pasteurized milk, Mexican style cheese, and pate.⁴ *Listeria* spp. are ubiquitous in nature, being present in a wide range of unprocessed foods as well as in soil, sewage, and river water.⁵

Buffered Listeria Enrichment Broth, a modification of the formula by Lovett et al.,⁶ was developed after subsequent work concluded that enrichment properties can be improved by increasing the buffering capacity of the medium with the addition of Disodium Phosphate. *Listeria* spp. grow over a pH range of 5.0 - 9.6, and survive in food products with pH levels outside these parameters.⁷ *Listeria* spp. are microaerophilic, Gram-positive, asporogenous, non-encapsulated, non-branching, short, motile rods. Motility is pronounced at 20°C. Identification of *Listeria* is based on successful isolation of the organism, biochemical characterization, and serological confirmation.

Principles of the Procedure

Enzymatic Digest of Casein, Enzymatic Digest of Soybean Meal, and Yeast Extract provides nitrogen, vitamins, and minerals in Buffered Listeria Enrichment Broth. Dextrose is the carbohydrate source. Sodium Chloride maintains osmotic balance of the medium. Monopotassium Phosphate, Dipotassium Phosphate, and Disodium Phosphate are the buffering agents. Nalidixic Acid inhibits growth of Gram-negative organisms. Acriflavin inhibits Gram-positive bacteria. Cyclohexamide is used to inhibit growth of saprophytic fungi.

Formula / Liter

| | |
|--|---------|
| Enzymatic Digest of Casein | 17 g |
| Enzymatic Digest of Soybean Meal | 3 g |
| Yeast Extract | 6 g |
| Dextrose..... | 2.5 g |
| Sodium Chloride | 5 g |
| Monopotassium Phosphate | 1.35 g |
| Dipotassium Phosphate..... | 2.5 g |
| Disodium Phosphate..... | 9.6 g |
| Cycloheximide | 0.05 g |
| Nalidixic Acid | 0.04 g |
| Acriflavin | 0.015 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. TOXIC. Toxic by inhalation and if swallowed. Possible risk to unborn child. Irritating to eyes, respiratory system, and skin.

Directions

1. Dissolve 47 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 light beige to beige.

Prepared Appearance: Prepared medium is gold to yellow, and clear to slightly hazy.

Expected Cultural Response: Cultural response in Buffered Listeria Enrichment Broth at 30 ± 2°C and examined for growth after 18 - 48 hours incubation.

| Microorganism | Approx. Inoculum (CFU) | Expected Growth |
|--|------------------------|-----------------------------|
| <i>Escherichia coli</i> ATCC® 25922 | 1000 | Inhibited |
| <i>Listeria monocytogenes</i> ATCC® 7644 | 10 - 300 | Good growth |
| <i>Staphylococcus aureus</i> ATCC® 25923 | 1000 | Suppressed at 18 – 24 hours |

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

Test Procedure

Use recommended laboratory procedures for isolating *Listeria* in food samples.

Results

Refer to appropriate references and procedures for results.

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

Limitation of the Procedure

Due to nutritional variation, some strains may be encountered that grow poorly or fail to grow on this medium.

Packaging

| | | | |
|---|-----------------|--------------|--------------|
| Buffered Listeria Enrichment Broth | Code No. | 7579A | 500 g |
| | | 7579B | 2 kg |
| | | 7579C | 10 kg |

References

1. **Murray, E. G. D., R. A. Webb, and M. B. R. Swann.** 1926. A disease of rabbits characterized by large mononuclear leucocytosis caused by a hitherto undescribed bacillus *Bacterium monocytogenes*. J. Path. Bact. **29**:407-439.
2. **Monk, J. D., R. S. Clavero, L. R. Beuchat, M. P. Doyle, and R. E. Brackett.** 1994. Irradiation inactivation of *Listeria monocytogenes* and *Staphylococcus aureus* in low and high fat, frozen refrigerated ground beef. J. Food Prot. **57**:969-974.
3. **Bremer, P. J., and C. M. Osborne.** 1995. Thermal-death times of *Listeria monocytogenes* in green shell mussels prepared for hot smoking. J. Food Prot. **58**:604-608.
4. **Grau, F. H., and P. B. Vanderlinde.** 1992. Occurrence, numbers, and growth of *Listeria monocytogenes* on some vacuum-packaged processed meats. J. Food Prot. **55**:4-7.
5. **Patel, J. R., C. A. Hwang, L. R. Beuchat, M. P. Doyle, and R. E. Brackett.** 1995. Comparison of oxygen scavengers for their ability to enhance resuscitation of heat-injured *Listeria monocytogenes*. J. Food Prot. **58**:244-250.
6. **Lovette, J., D. W. Frances, and J. M. Hunt.** 1987. *Listeria monocytogenes* In raw milk: detection, incidence and pathogenicity. J. Food Prot. **50**:188-192.
7. **Vanderzant, C., and D. F. Splittstoesser (eds.).** 1992. Compendium of methods for the microbiological examination of foods, 3rd ed. American Public Health Association, 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.