UVM MODIFIED LISTERIA ENRICHMENT BROTH (7409)

Intended Use

UVM Modified Listeria Enrichment Broth is used for the 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 woman.[2] Epidemiological evidence from outbreaks of listeriosis has indicated that the principle route of transmission is via the consumption of foodstuffs contaminated with *Listeria monocytogenes*.[3] Implicated vehicles of transmission include turkey frankfurters,[4] coleslaw, pasteurized milk, Mexican style cheese, and pate′. *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]

UVM Modified Listeria Enrichment Broth is a modification of the formula described by Donnelly and Baigent.[6] This formula is used for the selective enrichment of *Listeria* spp. from food [7,8] and clinical specimens.[9] *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 Animal Tissue, Beef Extract, and Yeast Extract provides nitrogen, vitamins, and minerals in UVM Modified Listeria Enrichment Broth. The Phosphates are the buffering agents, Sodium Chloride maintains osmotic balance. Nalidixic Acid inhibits growth of Gram-negative organisms. Acriflavin inhibits Gram-positive bacteria. Esculin is hydrolyzed by *Listeria* spp. A blackening of the medium by cultures containing esculin-hydrolyzing bacteria is the result of the formation of 6, 7-dihydroxycoumarin that reacts with the ferric ions.[10] The high salt tolerance of *Listeria* is used as a means to inhibit growth of enterococci.

Formula / Liter

Enzymatic Digest of Casein	5 g
Enzymatic Digest of Animal Tissue	5 g
Beef Extract	5 g
Yeast Extract	5 g
Sodium Chloride	20 g
Disodium Phosphate	9.6 g
Monopotassium Phosphate	1.35 g
Esculin	1 g
Acriflavin	0.012 g
Nalidixic Acid	0.02 g

Final pH: 7.2 ± 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 52 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 tan.

Prepared Appearance: Prepared medium is clear to trace hazy, green-yellow to amber with opalescent greenish top.

Expected Cultural Response: Cultural response in UVM Modified Listeria Enrichment Broth at 25 - 30°C and examined for growth after 18 - 48 hours incubation.

Microorganism	Approx. Inoculum (CFU)	Expected Results
Escherichia coli ATCC® 25922	10^3	Inhibited
Listeria monocytogenes ATCC® 7644	10 - 300	Good to excellent
Listeria monocytogenes ATCC® 15313	10 - 300	Good to excellent
Staphylococcus aureus ATCC® 25923	10 - 300	Suppressed at 18 – 24 hours

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

Test Procedure

The USDA/FSIS[8] method states to add 25 mL liquid or 25 g sample **+** 225 mL UVM Modified Listeria Enrichment Broth. For environmental sponges, add 225 mL of UVM Broth to each bagged sponge sample. After incubation, a portion of the enrichment mixture is added to an enrichment broth or plated onto the final isolation agar.[7] Refer to appropriate references for further information on testing food samples or clinical specimens.[7-9]

Results

Refer to appropriate references and procedures for results.

Storage

Store the 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.

Expiration

Refer to the expiration date stamped on the container. The dehydrated medium should be discarded if it is not free flowing, or if the color has changed from the original light tan. 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. *Listeria* spp., other than *Listeria monocytogenes*, can grow on isolation media. An identification of *Listeria monocytogenes* must be confirmed through biochemical and serological testing.[10]

Packaging

UVM Modified Listeria Enrichment Broth	**Code No.**	**7409A**	**500 g**
		7409B	**2 kg**
		7409C	**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 ahitherto 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.
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7. **Vanderzant, C., and D. F. Splittstoesser (eds.).** Compendium of methods for the microbiological examination of foods, 3rd ed. American Public Health Association, Washington, D.C.
8. **United States Department of Agriculture, Food Safety and Inspection**, 2008. Isolation and identification of *Listeria monocytogenes* from red meat, poultry, eggs, and environment samples. MLG 8.06. USDA/FSIS Microbiology laboratory guidebook, Washington, D.C.
9. **Murray, P. R., E. J. Baron, M. A. Pfaller, F. C. Tenover, and R. H. Yolken (eds.).** Manual of clinical microbiology, 6th ed. American Society for Microbiology, Washington, D.C.
10. **Fraser, J., and W. Sperber.** 1988. Rapid detection of *Listeria* in food and environmental samples by esculin hydrolysis. J. Food Prot. **51:**762-765.

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.

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