FRASER BROTH BASE (7502)

Intended Use

Fraser Broth Base is used with ferric ammonium citrate for the selective enrichment of *Listeria* species in a laboratory setting. Fraser Broth Base is not intended for use in the diagnosis of disease or other conditions in humans.

Product Summary and Explanation

Listeria monocytogenes, described in 1926 by Murray, Webb and Swann, is a widespread problem in food industries.[1] Epidemiological evidence from outbreaks of listeriosis indicate the principle route of transmission is via the 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* species are ubiquitous in nature, present in a wide range of unprocessed foods and in soil, sewage, and river waste.[5]

Fraser Broth Base is based on the formulation of Fraser and Sperber.[6] This medium is used in rapid detection of *Listeria* from food[7,8] and environmental samples. *Listeria* species grow over a pH range of 5.0 - 9.6, and can survive in food products with pH levels outside these parameters.[9] 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 provide nitrogen, vitamins, and minerals in Fraser Broth Base. The Phosphates are the buffering agents. Sodium Chloride maintains osmotic balance. Differentiation is aided by including Ferric Ammonium Citrate in the final medium. Since all *Listeria* species hydrolyze esculin, the addition of ferric ions to the medium will detect the reaction. A blackening of the medium by cultures containing esculin hydrolyzing bacteria is the result of formation of 6,7-dihydroxycoumarin that reacts with ferric ions.[6] Selectivity is provided by the presence of Lithium Chloride, Nalidixic Acid, and Acriflavin in the formula. The high salt tolerance of *Listeria* is used 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	0.024 g
Nalidixic Acid	0.020 g
Lithium Chloride	3 g

Final pH: 7.2 ± 0.2 at 25°C

Formula may be adjusted and/or supplemented as required to meet performance specifications.

Supplement (7984)
Fraser Broth Base
5% Ferric Ammonium Citrate,
10 mL filtered sterilized aqueous solution /L

Precautions

1. For Laboratory Use Only.
2. HARMFUL. Harmful if swallowed, inhaled, or absorbed through the skin. Irritating to eyes, skin, and respiratory system. May cause central nervous system effects.

Directions

1. Dissolve 55 g of the medium in one liter of purified water.
2. Mix thoroughly.
3. Autoclave at 121°C for 15 minutes.
4. Aseptically add 10 mL of Fraser Broth Base Supplement (7984).

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Quality Control Specifications

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

Prepared Appearance: Prepared medium is golden yellow with an amber opalescent top, clear to slight hazy, with none to light precipitate.

Expected Cultural Response: Cultural response in Fraser Broth Base incubated aerobically at 35 ± 2°C and examined for growth after 18 - 48 hours incubation.

Microorganism	Approx. Inoculum (CFU)	Expected Results
Escherichia coli ATCC® 25922	1000	Inhibited
Listeria monocytogenes ATCC® 7644	10 - 300	Growth w/blackening
Listeria monocytogenes ATCC® 15313	10 - 300	Growth w/blackening
Staphylococcus aureus ATCC® 25923	10 - 300	Inhibited (@ 18-24 hrs)

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

Test Procedure

To isolate *Listeria monocytogenes*, refer to appropriate procedures recommended by U.S.D.A.[7] and FDA/BAM[8] Methods.

Results

For further identification and confirmation of *Listeria* species, consult appropriate references.[7,8,9,10,11] Rapid slide and macroscopic tube tests can be used for definitive serological identification.

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

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

Packaging

Fraser Broth Base	**Code No.**	**7502A**	**500 g**
		7502B	**2 kg**
		7502C	**10 kg**
Fraser Broth Base Supplement		**7984**	**10 vials/pkg**

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. Bacteriol. **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 and 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 monoytogenes*. J. Food Prot. **58:**244-250.
6. **Fraser, J., and W. Sperber.** 1988. Rapid detection of *Listeria* in food and environmental samples by esculin hydrolysis. J. Food Prot. **51:** 762-765.
7. **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.
8. **www.fda.gov/Food/ScienceResearch/LaboratoryMethods/BacteriologicalAnalyticalManualBAM/default.htm**
9. **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.
10. **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.
11. **Marshall, R. T. (ed.).**, Standard methods for the examination of dairy products,16th 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.

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