

REVEAL® HALF FRASER BROTH PLUS FOR *LISTERIA* (9782) BULK HALF FRASER BROTH PLUS (9785)

Intended Use

Reveal Half Fraser Broth Plus is used in the Reveal *Listeria* Test System as a selective enrichment for *Listeria* species.

Product Summary and Explanation

Listeria monocytogenes, described first in 1926 by Murray, Webb and Swann, is an extensive problem in public health and food industries.¹ 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 indicates the principle route of transmission is via the consumption of foods contaminated with *Listeria monocytogenes*.³ Implicated vehicles of transmission include meat, eggs, chicken, vegetables, and dairy products.⁴ Certain strains of *Listeria* spp. are able to survive the manufacturing and ripening processes in dairy products.

Reveal Half Fraser Broth Plus is a modification of the formulation from Fraser and Sperber.⁵ Reveal Half Fraser Broth Plus is used as the primary enrichment in the Reveal *Listeria* Test System. Enrichment media are used to nurture any injured or stress cells, along with inhibiting normal flora or nuisance organisms. This enrichment is optimal for flagellar expression and detection by the Reveal Test Device.

Principles of the Procedure

Enzymatic Digest of Casein, Enzymatic Digest of Animal Tissue, Beef Extract, and Yeast Extract provide nitrogen, vitamins, and minerals in this medium. The Phosphates are the buffering agents. Sodium Chloride maintains osmotic balance. Differentiation is aided by Ferric Ammonium Citrate. 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.⁵ 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
Ferric Ammonium Citrate.....	0.25 g
Acriflavin	0.012 g
Nalidixic Acid.....	0.010 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.

Precautions

1. For Laboratory Use.
2. HARMFUL. Harmful if swallowed, inhaled, or absorbed through the skin. Skin irritation may be severe. Irritating to eyes, respiratory system, and skin. Lithium Chloride may result in central nervous effects.

Directions

Preparation directions are dependent upon the type of sample tested. Refer to the Reveal *Listeria* Test System package insert under the section Testing of Different Commodities, Sample Preparation and Enrichment for complete instructions for sponge and swab samples.

1. Transfer the contents of one unitized bottle of Half Fraser Broth Plus (# 9782) **OR**, 12.4 g of Bulk Half Fraser Broth Plus (# 9785) into a Stomacher-type bag.

2. Add 225 mL of sterile water. DO NOT AUTOCLAVE.
3. Grasp the bag tightly 2 - 3 inches from the top, and mix vigorously until dissolved.
Note: Use re-hydrated Half Fraser Broth Plus within the same day as prepared.

Quality Control Specifications

Dehydrated

Appearance: Medium should be pale yellow to tan in color and free-flowing.

Bioburden: No growth after 48 hours.

Re-hydrated

Solubility: 12.4 grams solubilizes in 225 mL of water within 5 minutes.

pH: pH of re-hydrated medium should be 7.2 ± 0.2 .

Performance: When used with Reveal Buffered *Listeria* Enrichment Broth, provides for the detection of *Listeria* spp. ATCC 33090, ATCC 19111, ATCC 19112, ATCC 19115 inoculated at ≤ 10 CFU, when package insert procedure is followed.

Test Procedure

Refer to the Reveal *Listeria* Test System package insert under the sections Testing of Different Commodities and Testing with the *Listeria* Device for complete instructions on the test procedure. To isolate *Listeria* spp. from milk, dairy products, and food samples refer to appropriate references.⁶⁻⁸

Results

Refer to the Reveal *Listeria* Test System package insert under the section Interpretation of Results for a complete discussion of the test results.

Storage

Store sealed bottle containing the dehydrated medium at 15 - 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 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. DO NOT AUTOCLAVE Reveal Half Fraser Broth Plus Medium.
2. Identification of *Listeria monocytogenes* must be confirmed by biochemical and serological testing.
3. Use re-hydrated primary or secondary enrichment media within the same day as prepared.

Packaging

Reveal Half Fraser Broth Plus for <i>Listeria</i>	Code No. 9782	20 unitized, pre-measured bottles
Reveal Half Fraser Broth Plus for <i>Listeria</i>	9785	500 g for 40 tests/samples

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. **Fraser, J., and W. Sperber.** 1988. Rapid detection of *Listeria* in food and environmental samples by esculin hydrolysis. J. Food Prot. **51**:762-765.
6. **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.
7. **Marshall, R. T. (ed.).** Standard methods for the examination of dairy products 16th ed. American Public Health Association, Washington D.C.
8. **Hitchins, A. D.** 1998. Detection and enumeration of *Listeria monocytogenes* in foods. Bacteriological analytical manual, 8th ed. U.S. Food and Drug Administration, Washington, D.C.

Technical Information

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