



PRODUCT SPECIFICATION SHEET

Fraser Broth Base (DM1292)

Intended Use

Fraser Broth Base (DM1292) is recommended for a primary and secondary enrichment medium for isolation and enumeration of *Listeria monocytogenes* from food and animal feeds.

Product Summary and Explanation

Listeria species are microaerophilic, gram-positive, asporogenous, non-encapsulated, non-branching, regular, short, motile rods. Motility is most pronounced at 20°C. The most common contaminating bacteria found in food sources potentially containing *Listeria* are: streptococci, especially the enterococci, micrococci, *Bacillus* species, *Escherichia coli*, *Pseudomonas aeruginosa* and *Proteus vulgaris*.⁽¹⁾ *Listeria* species grow over a pH range of 4.4-9.6, and survive in food products with pH levels outside these parameters.⁽²⁾ Identification of *Listeria* is based on successful isolation of the organism, biochemical characterization and serological confirmation.

Among the *Listeria* species only *Listeria monocytogenes* is reported to cause infection in humans. In 1926 Murray, Webb and Swann,⁽³⁾ first described that *Listeria monocytogenes* is a widespread problem in public health and the food industries. This organism can cause human illness such as meningitis, encephalitis or septicemia and the tropism of *L. monocytogenes* for the central nervous system leads to severe disease, often with high mortality or with neurologic disorders among survivors,⁽⁴⁾ particularly in immunocompromised individuals and pregnant women.⁽⁵⁾ The first food-borne outbreak of listeriosis was reported in 1985.⁽⁶⁾ Since then, microbiological and epidemiological evidence from both sporadic and epidemics of listeriosis has shown that the principal route of transmission is via the consumption of foodstuffs contaminated with *Listeria monocytogenes*.⁽⁷⁾ Concerned vehicles of transmission include Mexican-style cheese, coleslaw, turkey frankfurters, pasteurized milk and pickled pork tongue.⁽⁸⁾ The organism has been isolated from commercial dairy and other food processing plants, and is ubiquitous in nature, being present in a wide range of unprocessed foods and in soil, sewage, silage and river water.⁽⁹⁾

Fraser Broth Base is based on the formulation of Fraser and Sperber⁽¹⁰⁾ and is used for the detection of *Listeria* species in food products. Fraser Broth Base is formulated so as to provide optimum conditions for the growth of *Listeria* from food and environmental samples.

Principles of the Procedure

Fraser Broth Base contains peptic digest of animal tissue, casein enzymic hydrolysate, yeast extract, and beef extract make the media highly nutritive by providing nitrogen, carbon and other essential nutrients necessary for growth of organisms. Phosphates maintain the buffering capacity of the medium. All *Listeria* species exhibit beta-glucosidase activity which is evident by the blackening of the media. *Listeria* species hydrolyze esculin (substituted glucoside) to glucose and esculentin. The latter combines with ferric ions of ferric ammonium citrate (MS130), resulting in the formation of 6-7 dihydroxycoumarin, a black brown complex. Ferric ammonium citrate also enhances the growth of *L.monocytogenes*. The high salt tolerance (of sodium chloride) of *Listeria* is used as means to inhibit the growth of *Enterococci*. Lithium chloride is also used to inhibit *Enterococci*, which also possess the ability to hydrolyze esculin. Growth of accompanying bacteria is largely inhibited by the addition of Nalidixic acid and Acriflavin hydrochloride (MS131I).

Formula / Liter

Ingredients	Gms / Liter
Peptic digest of animal tissue	5.00
Casein enzymic hydrolysate	5.00
Yeast extract	5.00
Meat extract	5.00
Sodium chloride	20.00
Disodium hydrogen phosphate.2H ₂ O	12.00
Potassium dihydrogen phosphate	1.35
Esculin	1.00
Lithium chloride	3.00
Final pH: 7.2 ± 0.2 at 25°C	
Formula may be adjusted and/or supplemented as required to meet performance specifications	





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Precautions

1. For Laboratory Use only.
2. IRRITANT. Irritating to eyes, respiratory system, and skin.
3. Lithium chloride is harmful. Avoid bodily contact and inhalation of vapours. On contact with skin wash with plenty of water immediately.

Directions

1. Suspend 54.92 grams of dehydrated medium in one liter of distilled water.
2. Heat if necessary to dissolve the medium completely.
3. Autoclave at 121°C, 15 psi pressure, for 15 minutes / validated cycle.
4. Cool to 45-50°C and aseptically add rehydrated contents of 1 vial of Fraser Selective Supplement (MS131I) and 2 vials of Fraser Supplement (MS130) to 1000 ml medium for primary enrichment or 1 vial of each to 500 ml medium for secondary enrichment.

OR

One vial of MS216, sufficient 225 ml medium. Rehydrate the contents of 1 vial aseptically with 4ml 1:1 ethanol:sterile distilled water. Mix well and aseptically add to 225 ml of sterile, cooled (45-50°C) Fraser Broth base (DM1292).

OR

One vial, sufficient 500ml/1000 ml medium. Rehydrate the contents of 1 vial aseptically with 10 ml of sterile distilled water. Mix well. For primary enrichment aseptically add 1 vial of MS217 to 1000 ml, sterile, cooled (45-50°C) Fraser Broth Base DM1292 or to 500 ml sterile Fraser Broth Base DM1292 for secondary enrichment.

5. Mix well and dispense as desired.

Quality Control Specifications

Dehydrated Appearance	Cream to yellow homogeneous free flowing powder
Prepared Medium	Basal medium : Yellow coloured clear solution with slight precipitate. After addition : Fluorescent yellow coloured clear solution with slight precipitate forms in tubes.
Reaction of 5.49% Solution	pH : 7.2 ± 0.2 at 25°C
Gel Strength	Not Applicable

Expected Cultural Response: Cultural characteristics observed on addition of MS131I and MS130 after an incubation at 35-37°C for 24-48 hours.

Sr. No.	Organisms	Results to be achieved		
		Inoculum (CFU)	Growth	Esculin Hydrolysis
1.	<i>Escherichia coli</i> ATCC 25922	>=10 ³	inhibited	--
2.	<i>Enterococcus faecalis</i> ATCC 29212	>=10 ³	inhibited	--
3.	<i>Listeria monocytogenes</i> ATCC 19111	50 - 100	good-luxuriant	positive reaction, blackening of medium
4.	<i>Listeria monocytogenes</i> ATCC 19112	50 - 100	good-luxuriant	positive reaction, blackening of medium
5.	<i>Listeria monocytogenes</i> ATCC 19117	50 - 100	good-luxuriant	positive reaction, blackening of medium
6.	<i>Listeria monocytogenes</i> ATCC 19118	50 - 100	good-luxuriant	positive reaction, blackening of medium
7.	<i>Staphylococcus aureus</i> ATCC 25923	>=10 ³	inhibited	--

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

Test Procedure



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1. The test sample under study is inoculated into the primary enrichment medium.
2. After an incubation at 30°C for 18-24 hours, 0.1 ml is inoculated into Fraser Broth Base (M1292).
3. After an incubation at 35-37°C for 24-48 hours, it is subcultured on Listeria Oxford Medium Base (DM1078) or Listeria Identification Agar Base (PALCAM) (DM932).

Results

Refer to appropriate references and test procedures for interpretation of results.

Storage

Store the sealed bottle containing the dehydrated medium at 10 - 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 not free flowing, or if the appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure

1. Since *Listeria* species other than *L. monocytogenes* can grow on these media, an identification of *Listeria monocytogenes* must be confirmed by biochemical and serological testing.
2. Poor growth and a weak esculin reaction may be seen after 40 hours incubation for some enterococci.
3. Consult appropriate texts for detailed information and recommended procedures.

Packaging

Product Name : Fraser Broth Base

Product Code : DM1292

Available Pack sizes : 500gm

References

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10. Fraser and Sperber, 1988, J. Food Prot., 51:762-765.

Further Information

For further information please contact your local MICROMASTER Representative.



MICROMASTER LABORATORIES PRIVATE LIMITED

Unit 38/39, Kalpataru Industrial Estate,
Off G.B. Road, Near 'R-Mall', Thane (W) - 400607. M.S. INDIA.
Ph: +91-9320126789/9833630009/9819991103
Email: sales@micromasterlab.com

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