

## Technical Information

### Fraser Secondary Enrichment Broth Base

#### Product Code: DM 2083

**Application:** - Fraser Secondary Enrichment Broth Base with added supplement is used for isolation, cultivation and enrichment of *Listeria monocytogenes* from food and environmental specimens.

#### Composition\*\*

Ingredients	Gms / Litre
Proteose peptone	5.000
Casein enzymic hydrolysate	5.000
Yeast extract	5.000
Beef extract	5.000
Sodium chloride	20.000
Lithium chloride	3.000
Disodium phosphate	12.000
Monopotassium phosphate	1.350
Esculin	1.000
Ferric ammonium citrate	0.500
Final pH ( at 25°C)	7.2±0.2

\*\*Formula adjusted, standardized to suit performance parameters

#### Principle & Interpretation

Fraser Secondary Enrichment Broth is used by APHA (3). Fraser Secondary Enrichment Broth Base is formulated so as to provide optimum conditions for the growth of *Listeria*. Fraser Secondary Enrichment Broth is a modification of United States Department of Agriculture-Food Safety Inspection Service (USDA-FSIS) UVM Secondary Enrichment Broth. It is based on the formulation of Fraser and Sperber (1) and found to be remarkably accurate in detecting *Listeria* species in food and environmental samples (2).

Proteose peptone, casein enzymic hydrolysate, yeast extract, and beef extract make the media highly nutritive by providing essential nutrients including carbonaceous and nitrogenous substances. 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 esculetin. The latter combines with ferric ions of ferric ammonium citrate, resulting in the formation of 6-7 dihydroxycoumarin, a black brown complex. Ferric ammonium citrate also inhibits the growth of *L. monocytogenes* (4). The high salt tolerance (of sodium chloride) of *Listeria* is used as means to prevent the growth of Enterococci. Lithium chloride is also used to enhance 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 (FD).

#### Methodology

Suspend 57.85 grams of dehydrated media in 990 ml distilled water. Mix thoroughly & heat if necessary to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 45 - 50°C and aseptically add rehydrated contents of 1 vial of Fraser Enrichment Supplement (MS 2065) or one vial of Fraser Selective Supplement (MS 2125). Shake well and dispense as desired.

**Warning:** Lithium chloride is harmful. Avoid bodily contact and inhalation of vapours. On contact with skin, wash with plenty of water immediately.

## Quality Control

### Appearance

Cream to yellow homogeneous free flowing powder

### Colour and Clarity

**Basal medium:** Yellow coloured, clear solution with slight precipitate. After addition of MS 2065 or MS 2125: Fluorescent yellow coloured, clear solution with slight precipitate forms in tubes.

### Reaction

Reaction of 5.78% w/v aqueous solution at 25°C. pH : 7.2±0.2

### Ph Range

7.00-7.40

### Cultural Response

DM 2083: Cultural characteristics observed with added Fraser enrichment supplement (MS 2065) or Fraser Selective Supplement (MS 2125) after an incubation at 35-37°C for 24-48 hours.

Organism	Inoculum (CFU)	Growth	Esculin hydrolysis
<i>Escherichia coli</i> ATCC25922	$\geq 10^3$	inhibited	
<i>Enterococcus faecalis</i> ATCC29212	$\geq 10^3$	inhibited	
<i>Listeria monocytogenes</i> ATCC 19111	50-100	good-luxuriant	positive reaction, blackening of medium
<i>Listeria monocytogenes</i> ATCC 19112	50-100	good-luxuriant	positive reaction, blackening of medium
<i>Listeria monocytogenes</i> ATCC 19117	50-100	good-luxuriant	positive reaction, blackening of medium
<i>Listeria monocytogenes</i> ATCC 19118	50-100	good-luxuriant	positive reaction, blackening of medium
<i>Staphylococcus aureus</i> ATCC 25923	$\geq 10^3$	inhibited	

## Storage and Shelf Life

**Dried Media:** Store below 30°C in tightly closed container and the prepared medium at 2 - 8°C. Use before expiry date on the label.

**Prepared Media:** 2-8° in sealable plastic bags for 2-5 days.

## Further Reading

1. Fraser J.A. and Sperber W.H., 1988, Food Protect., 51(10):762.
2. McClain D. and Lee W.H., 1988, J. Assoc. Off. Anal. Chem., 71(3):660.
3. Downes F. P. and Ito K., (Eds.), 2001, Compendium of Methods for the Microbiological Examination of Foods, 4th Ed., APHA, Washington, D.C.
4. Cowart R. E. and Foster B. G., 1985, J. Infect. Dis.; 151:172.

## Disclaimer :

- User must ensure suitability of the product(s) in their application prior to use.
- The product conform solely to the technical information provided in this booklet and to the best of knowledge research and development work carried at CDH is true and accurate
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