Fraser Broth Base, Modified

M1764

It is recommended for the selective enrichment of *Listeria* species from foods.

Composition**

Ingredients	Gms / Litre
Peptic digest of animal tissue (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	9.600
Monopotassium phosphate	1.350
Esculin	1.000
Nalidixic acid	0.010
Acriflavin	0.0125
Final pH (at 25°C)	7.2±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 54.97 grams of dehydrated medium in 1000 ml distilled water. 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 2 vials of Fraser Supplement (FD141). Mix 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.

Principle And Interpretation

Listeria species are widely distributed and are isolated from soil, decaying vegetable matter, sewage, water, animal feed, fresh and frozen poultry, meats, raw milk, cheese and asymptomatic human and animal carriers (1). Only *Listeria monocytogenes* from the genus *Listeria* ; causes infections in humans. *L. monocytogenes* primarily causes meningitis, encephalitis or septicemia in humans (2, 3). In pregnant women, *Listeria monocytogenes* often causes an influenza like bacteremic illness that, if untreated, may lead to ammionitis and infection of the fetus, resulting in abortion, still birth or premature birth. Contaminated foods are the primary vehicles of transmission (4).

Fraser Broth Base, Modified is based on the formulation by Fraser and Sperber (9). It is recommended for selective enrichment of *Listeria* species from foods.

This medium contains peptic digest of animal tissue, casein enzymic hydrolysate, yeast extract and beef extract which provide essential nutrients like carbon and nitrogenous compounds including vitamins, amino acids and trace ingredients. Phosphates buffer the medium while sodium chloride maintains osmotic equilibrium. Nalidixic acid and Acriflavin inhibits the growth of gram-negative and gram-positive organisms respectively (5,6,7) except *Listeria* species (5,6,7). *Listeria* species hydrolyze esculin to glucose and esculetin. The latter combines with ferric ions of ferric ammonium citrate (FD141), resulting in the formation of 6-7 dihydroxycoumarin, a black brown complex. Ferric ammonium citrate also enhances the growth of *L. monocytogenes* (8). 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.

Quality Control

Appearance

Cream to yellow homogeneous free flowing powder

Colour and Clarity of prepared medium

Fluorescent yellow coloured clear solution.

Reaction
Reaction of 5.5% w/v aqueous solution at 25°C. pH : 7.2±0.2

pH
7.00-7.40

Cultural response
Cultural characteristics observed on addition of FD141 after an incubation at 35 - 37°C for 24-48 hours.

Cultural Response

Organism	Inoculum (CFU)	Growth	Esculin Hydrolysis
Cultural response			
Escherichia coli ATCC 25922	>=10^3	inhibited	
Enterococcus faecalis ATCC 29212	50-100	none-poor	
Listeria monocytogenes ATCC 19111	50-100	good-luxuriant	positive reaction, blackening of medium
Listeria monocytogenes ATCC 19112	50-100	good-luxuriant	positive reaction, blackening of medium
Listeria monocytogenes ATCC 19117	50-100	good-luxuriant	positive reaction, blackening of medium
Listeria monocytogenes ATCC 19118	50-100	good-luxuriant	positive reaction, blackening of medium
Staphylococcus aureus ATCC 25923	>=10^3	inhibited	

Storage and Shelf Life
Store dehydrated and prepared medium at 2-8°C. Use before expiry date on the label.

Reference
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