

Technical Information

Fraser MiVeg Broth Base

Product Code : VM2327

Application:- Fraser MiVeg Broth Base with added supplement is recommended as a primary as well as secondary enrichment medium, for the isolation and enumeration of *Listeria monocytogenes* from food and animal feeds.

Composition

Ingredients	Gms / Litre
MiVeg peptone	5.0
MiVeg hydrolysate	5.0
Yeast extract	5.0
MiVeg extract No. 1	5.0
Sodium chloride	20.0
Disodium phosphate.2H ₂ O	12.0
Potassium dihydrogen phosphate	1.35
Esculin	1.0
Lithium chloride	3.0
Final pH (at 25°C)	7.2 ± 0.2

** Formula adjusted, standardized to suit performance parameters.

Principle & Interpretation

Fraser MiVeg Broth Base is prepared by adding vegetables peptones in place of animal based peptone thus making the medium free from BSE/TSE. This medium is the modification of Fraser Broth Base and it is suitable for detection of *Listeria* species found in food products and in samples from the environment (1). *Listeria* species grows over a pH range of 5.0-9.6 and survive in food products with pH levels above this range (2). High nutrient content and large buffering capacity of medium optimize the growth conditions for *Listeria* multiplication.

MiVeg peptone, MiVeg hydrolysate, yeast extract and MiVeg extract No.1 supplies all the essential nutrients required for the growth of the organisms. β-D-glucosidase activity of *Listeria* is evident by blackening of broth. This occurs due to hydrolysis of esculin (substituted glucoside) to yield glucose and esculetin. The latter combines with ferric ions in the medium to form black coloured complex. The addition of ferric ammonium citrate (MS2141) improves the growth of *Listeria monocytogenes*. Lithium chloride inhibits the growth of *Enterococci* which can hydrolyse esculin. The high salt tolerance of *Listeria* is used as a means to inhibit *Enterococci* growth. The growth of accompanying bacteria is largely inhibited by nalidixic acid and acriflavin hydrochloride (MS2125I). *Listeria monocytogenes* must be further confirmed by biochemical and serological testing, since *Listeria* species other than *Listeria monocytogenes* can also grow on this medium (3,4).

Methodology

Suspend 57.35 grams of powder media in 1000 ml distilled water. Mix well and heat if necessary to boiling 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 Selective Supplement (MS2125I) and 2 vials of Fraser Supplement (MS2141) to 1000 ml medium for primary enrichment or 1 vial of each to 500 ml medium for secondary enrichment. Mix well and dispense as desired.

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

Quality Control

Physical Appearance

Light yellow coloured, may have slightly greenish tinge, homogeneous, free flowing powder.

Colour and Clarity of prepared medium

Yellow coloured, clear solution with slight precipitate. With addition of supplement (MS2125I and MS2141) fluorescent yellow coloured solution forms with slight precipitate.

Reaction

Reaction of 5.73% w/v aqueous solution is pH 7.2 $\pm$ 0.2 at 25°C.

pH Range

7.0 - 7.4

Cultural Response/Characteristics

Cultural characteristics observed after an incubation at 35-37°C for 24-48 hours after addition of Fraser Selective Supplement (MS225I) and Fraser Supplement (MS2141).

Organisms (ATCC)	Inoculum (CFU)	Growth	Esculin hydrolysis
<i>Enterococcus faecalis</i> (29212)	10 ² -10 ³	inhibited	-
<i>Escherichia coli</i> (25922)	10 ² -10 ³	inhibited	-
<i>Listeria monocytogenes</i> (19111)	10 ² -2×10 ³	good-luxuriant	+
<i>Listeria monocytogenes</i> (19112)	10 ² -2×10 ³	good-luxuriant	+
<i>Listeria monocytogenes</i> (19117)	10 ² -2×10 ³	good-luxuriant	+
<i>Listeria monocytogenes</i> (19118)	10 ² -2×10 ³	good-luxuriant	+
<i>Staphylococcus aureus</i> (25923)	10 ² -10 ³	inhibited	-

Key : + = Black colouration to the medium.

Storage and Shelf Life

Dried Media: Store below 30°C in tightly closed container and use before expiry date as mentioned on the label.

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

Further Reading

1. Fraser J. A. and Sperber W. H., 1988, J. Food Prot., 51 : 762 - 765.
2. Downes FP and Ito K (Eds.), 2001, Compendium of Methods For The Microbiological Examination of Foods, 4th ed., APHA, Washington, D.C.
3. Murray PR, Baron, Pfaller, and Tenenbaum (Eds.), 2003, In Manual of Clinical Microbiology, 8th ed., ASM, Washington, D.C.
4. Standard Methods for the Examination of Dairy Products. 17th Edition, 2004 Edited by H. Michael Wehr and Joseph H. Frank.

Disclaimer :

- User must ensure suitability of the product(s) in their application prior to use.
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