

Fraser Listeria Selective Enrichment Broth Base (i23274)

Used as a secondary selective diagnostic enrichment medium for the isolation of *Listeria* spp.

Industry: Food / Clinical

Principles & Uses

Listeria monocytogenes poses severe health risks, causing conditions such as meningitis, encephalitis, and septicemia, particularly affecting pregnant women and leading to complications like abortion, stillbirth, or premature birth. The transmission of this pathogen primarily occurs through contaminated foods. To detect *Listeria* species, Fraser Broth Base, based on Fraser and Sperber's formulation, is employed, providing optimal conditions for their growth.

The components of Fraser Broth Base include peptones, yeast extract, and meat extract, offering essential nutrients for *Listeria* growth. Phosphates maintain the medium's buffering capacity. *Listeria* species exhibit beta-glucosidase activity, leading to the blackening of the media. Esculin hydrolysis to glucose and esculetin, combining with ferric ions, results in a distinctive black-brown complex.

Antibiotics and Ferric Ammonium Citrate are added to the medium as supplement. Small numbers of *Listeria*, often accompanied by other microorganisms, necessitate selective enrichment. Fraser Broth is instrumental in this process, conforming to ISO 11290 standards. Lithium chloride inhibits *enterococci*, and selective plating media confirm specificity after primary and secondary enrichments.

Composition (gr/L)

Proteose peptone 5 g, Peptone from Casein 5 g, Yeast Extract 5 g, Meat Extract 5 g, Sodium Chloride 20 g, Di-sodium hydrogen phosphate 12 g, Potassium dihydrogen phosphate 1.35 g, Esculin 1 g, Lithium Chloride 3 g.

Final pH at 25°C 7.2 ± 0.2

Preparation from dehydrated Powder

Suspend 55 g in 1 L of distilled water, sterilize by autoclaving at 121°C for 15 minutes, cool to 50°C, and aseptically add Fraser Selective Supplement, including 0.5 g ferric ammonium citrate, 20 mg Nalidixic acid, and 20 mg Acriflavine hydrochloride. Mix well.

Quality Control

Dehydrated Appearance: Free flowing, homogeneous, tan.

Prepared Appearance: Medium amber, clear to slightly opalescent with a fine precipitate.

Reaction of 5.5% Solution at 25°C: pH 7.2 ± 0.2

Cultural Response

1- Enrichment step: The half-concentrated FRASER broth is inoculated with sample material and incubated at 30 °C for 24 ± 2 hours. From this culture, a selective growth medium such as OXFORD or PALCAM Agar is inoculated.

2- Enrichment step: From the first enrichment step, 0.1 ml is inoculated on to 10 ml FRASER broth for two incubations of 48 ± 2 hours at 35 °C or 37°C. After each 24 hours period selective growth media such as OXFORD and/or PALCAM agar are inoculated.

Organism (ATCC*)	Recovery	Esculin reaction
<i>Listeria monocytogenes</i> (19111)	+	+
<i>Listeria monocytogenes</i> (13932)	+	+
<i>Escherichia coli</i> (25922)	Marked to complete inhibition	-
<i>Enterococcus faecalis</i> (19433)	Marked to complete inhibition	-
<i>Staphylococcus aureus</i> (25923)	Marked to complete inhibition	-

*ATCC is a registered trade mark of the American Type Culture Collection.



Listeria monocytogenes (left). Prepared Culture Media (right).

Storage

Keep the container at 15-30 °C. Store prepared medium at 2-8 °C.