

Fraser/Broth Half Fraser/Broth

355-4569 / 356-4604
356-4615 / 356-4616
355-5797 / 355-5794

DEFINITION

Selective broths for primary (Fraser 1/2) and secondary (Fraser 1) enrichment of *Listeria* spp. in the analysis of food products.

STANDARDS

FOOD MICROBIOLOGY

- **NF EN ISO 11290-1/A1 (February 2005):** Food microbiology - Horizontal method for the detection and enumeration of *Listeria monocytogenes* - Detection method (IC: V08-028-1).
- **NF EN ISO 11290-2/A1 (February 2005):** Food microbiology - Horizontal method for the detection and enumeration of *Listeria monocytogenes* - Enumeration method (IC: V08-028-2).

PRINCIPLE

Fraser broths are used as primary (Fraser 1/2) and secondary (Fraser 1) enrichment for the detection of *Listeria* spp. in food products. Due to the combined action of lithium chloride, acriflavin and nalidixic acid, these broths inhibit "non-*Listeria*" flora.

These 2 broths are slightly buffered so as to slow acidification (acidifying flora), damaging to the growth of *Listeria* spp.

After enrichment (primary or secondary), the presence of *Listeria* spp. is detected by the broth turning a yellow to dark brown color (esculin hydrolysis). This color change is not systematic, however, and it is imperative to carry out isolation on a selective medium (AL, PALCAM and/or OXFORD or RAPID'*L.mono*) to be sure of the presence or otherwise of *Listeria* spp.

PRESENTATION

FRASER 1/2

- **Ready-to-use (complete)**
225 ml x 6 bottles **code 355-5797**
3 l x 4 bags **code 355-5794**
- **Dehydrated (base)**
500 g **code 356-4604**
- **Selective supplement**
Freeze-dried **code 356-4616**
Pack of 10 bottles
(1 bottle q.s.p 2,25 l base)

FRASER 1

- **Ready-to-use (complete)**
10 ml x 25 tubes **code 355-4569**
- **Dehydrated (base)**
500 g **code 356-4604**
- **Selective supplement**
Freeze-dried **code 356-4615**
Pack of 10 bottles
(1 bottle qsp 500 ml base)

STORAGE

- Ready-to-use: + 2°C - 8°C in the dark until the expiry date, and +15°C -25°C in the dark until 3 weeks.
- Dehydrated: + 15° to 25°C, in carefully-sealed bottles in a cool, dry place.
- Freeze-died selective supplement: + 2°C to 8°C in the dark.
- Expiration date and batch number are shown on the package.

THEORETICAL FORMULA

Base medium

Peptone	5 g
Tryptone	5 g
Yeast extract	5 g
Meat extract	5 g
Sodium chloride	20 g
Disodium hydrogen phosphate dihydrate	12 g
Potassium dihydrogen phosphate	1.35 g
Esculin	1 g
Lithium chloride	3 g
Distilled water	1,000 ml
Final pH (25°C) = 7.2 ± 0.2	

Fraser 1/2 selective supplement

Acriflavin hydrochloride	12.5 mg
Nalidixic acid	10 mg
Ferric ammonium citrate (III)	500 mg

Fraser 1 selective supplement

Acriflavin hydrochloride	25 mg
Nalidixic acid	20 mg
Ferric ammonium citrate (III)	500 mg

OTHER PRODUCTS REQUIRED (NOT SUPPLIED)

- Distilled water
- Distilled water and ethanol for preparation of the selective supplement.

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EQUIPMENT REQUIRED (NOT SUPPLIED)

(non-exhaustive)

- Scales
- Sterile weighing bags
- Grinder
- Sterile pipettes
- Vortex-type shaker
- Autoclave

PREPARATION OF DEHYDRATED MEDIUM

Always shake before use

Fraser 1/2 broth

• Dehydrated base

Dissolve 129.2 g of powder (**code 356-4604**) in 2.25 l of distilled water, mix until a homogenous suspension is obtained.

Heat gently, swirling frequently, then bring to boiling point until completely dissolved.

Dispense 225 ml per bottle.

Sterilize 15 minutes in autoclave at 121°C. Cool to room temperature before adding selective supplement.

• Freeze-dried supplement

Under aseptic conditions, reconstitute a bottle of Fraser 1/2 selective supplement (**code 356-4616**) with 22.5 ml of a 1:1 mixture of water/sterile ethanol.

• Complete medium

Add 2.25 ml of reconstituted selective supplement to 225 ml of base broth, autoclaved and cooled to between 44° and 47°C. Mix thoroughly.

Reconstitution ratio: 57.4 g/l

500 g of powder makes 8.7 liters of Fraser base.

Fraser 1 broth

• Dehydrated base

Dissolve 28,7 g of powder (**code 356-4604**) in 500 ml of distilled water, mix until a homogenous suspension is obtained.

Heat gently, swirling frequently, then bring to boiling point until completely dissolved.

Dispense 10 ml per tube.

Sterilize 15 minutes in autoclave at 121°C. Cool to room temperature before adding selective supplement.

• Freeze-dried supplement

Under aseptic conditions, reconstitute a bottle of Fraser 1 selective supplement (**code 356-4615**) with 5 ml of a 1/1 mixture of water/sterile ethanol.

• Complete medium

For each tube of base broth, previously cooled to between 44°C and 47°C, add 0.1 ml of reconstituted selective supplement.

PROTOCOL

Preparation of samples

According to standards for the product concerned

• Enrichment

For detection of *Listeria* spp. in 25 g (or 25 ml) of sample.

- Primary enrichment: Under aseptic conditions, weigh 25 g of test sample and add 225 ml of complete Fraser ½ broth. Incubate for 18-24 hours at 30°C.

- Secondary enrichment: Transfer 0.1 ml of culture from the primary enrichment to a tube of 10 ml of complete Fraser 1 broth. Incubate at 37°C ± 1°C for 18-24 hours and re-incubate up to 42 to 48 hours.

• Isolation of *Listeria* spp.

- Starting with primary enrichment, after 18-24 hours of incubation of Fraser 1/2 broth, inoculate - using an inoculating loop from the culture - the surface of a AL, PALCAM, OXFORD or Rapid[®] *L. Mono* agar.

- Starting with secondary enrichment, after 18- 24 hours of incubation of Fraser 1 broth, inoculate - using an inoculating loop from the culture - the surface of a PALCAM or OXFORD or RAPID[®] *L. mono* or AL. If necessary, isolate again after 42-48 hours incubation.

PRECAUTIONS

- The borders of the medium may present a whitish appearance. This does not affect its quality in any way, and will disappear after stirring.

- Comply with Good Laboratory Practice.

QUALITY CONTROL OF MANUFACTURER

Every product manufactured and marketed by Bio-Rad is subject to a quality-assurance procedure at all stages, from reception of raw materials through to commercialisation of end-product.

Each batch of finished product undergoes quality control and is marketed only if it satisfies the acceptability criteria.

Documentation relative to the production and control of each batch is kept on file.

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PERFORMANCES / QUALITY CONTROL OF THE TEST

The growth performances of the media are verified with the following strains:

STRAINS	Results of culture 48 h at 37°C
<i>Listeria monocytogenes</i> 4b ATCC 13932	> 10 UFC on Oxford or Palcam
<i>Escherichia coli</i> ATCC 25922	Inhibition on TSA
<i>Enterococcus faecalis</i> ATCC 19433	< 100 UFC on TSA

KEY WORDS

Fraser / *Listeria* / Food products / Enrichment / Detection / Broth.

BIBLIOGRAPHY

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