

Ferric Ammonium Citrate Supplement for Demi-Fraser Broth and Fraser Broth Bases

Why do I have to add the 3M™ Fraser Broth Supplement (Ferric Ammonium Citrate Supplement) to Demi-Fraser Broth or Fraser Broth for the 3M™ Molecular Detection Assay 2 – *Listeria* and 3M™ Molecular Detection Assay 2 – *Listeria monocytogenes* methods?

3M has evaluated the performance of the 3M Molecular Detection Assay 2 – *Listeria* and 3M Molecular Detection Assay 2 – *Listeria monocytogenes* with Demi-Fraser Broth and Fraser Broth supplemented with ferric ammonium citrate (FAC). Additionally, all third-party method validation studies, including the AOAC certified methods, have been conducted using FAC in the medium.

Using FAC supplemented media aligns the 3M Molecular Detection Assay 2 enrichment formulations with ISO 11290-1¹, the ISO standard method for detection of *Listeria monocytogenes*.

3M™ Fraser Broth Supplement (catalog number BP0220010) is a solution of ferric ammonium citrate at a concentration of 5% weight per volume (w/v).

A solution equivalent to the 3M Fraser Broth Supplement (5% w/v FAC solution) can be prepared from commercially available FAC salt.

How to prepare the 5% w/v FAC solution equivalent to 3M Fraser Broth Supplement from the commercially available salt:

General Description

FAC is a complex salt, composed of iron, ammonia and citric acid; FAC is soluble in water². The salt with an iron composition of 16 to 18.5% has a yellowish brown to solid red color and a faint odor of ammonia.

Synonyms³: ammonium iron citrate; ferric ammonium citrate; ammonium iron(III) citrate; iron ammonium citrate; ferric ammonium citrate; iron and ammonium citrate; ammonium ferric citrate; ammonium ferric citrate USP.

CAS Number 1185-57-5
 EC Number: 214-686-6
 Molecular Formula: C₆H₈FeNO₇
 Molecular Weight: 261.97 g/mol

Table 1. Directions for the preparation of 5% w/v FAC solution:

To prepare	FAC salt*	Distilled or Deionized Water	Dissolve	Final volume
10 mL	0.5 grams	5 mL	Stir until completely dissolved	Bring final volume to 10 mL
100 mL	5.0 grams	50 mL		Bring final volume to 100 mL
1 liter	50.0 grams	500 mL		Bring final volume to 1000 mL

- Autoclave for 15 minutes at 15 psi, 121 °C. Alternatively FAC solution may be filter sterilized.¹
- Final pH 7.2 ±0.2 at 25°C.
- FAC solution may be aliquoted in 10 mL fractions in 15 mL autoclavable tubes before autoclaving.
- FAC solution may be stored in larger volumes and aseptically added to the sterile media (see Table 2).
- Storage: 2-8°C, protected from light for up to but not longer than 12 months.

Table 2. How to supplement base medium with prepared 5% w/v FAC solution:

Volume of Medium	Volume of sterile Fraser Broth Supplement :
100 mL	1.0 mL
225 mL	2.25 mL
475 mL	4.75 mL
1 liter	10 mL

Can I add the FAC salt to the base medium before autoclaving?

The FAC salt should **not** be added to the base before autoclaving. In accordance to ISO 11290-1, the sterile FAC supplement should be aseptically added to the base immediately before use¹.

***Important Note:** When ordering FAC make sure the composition of the FAC salt ordered has an iron content of 16.5 to 18.5% and a yellowish brown to solid red color.

References

1. ISO/IEC. (1996). ISO/IEC 11290-1:1996 Microbiology of Food and Animal Feeding Stuffs –Horizontal Method for the Detection of *Listeria monocytogenes* – Part 1: Detection Method (ISO 11290:1996).



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2. National Center for Biotechnology Information. PubChem Compound Database; CID=14457, <https://pubchem.ncbi.nlm.nih.gov/compound/14457> (accessed Oct. 29, 2015).
3. Synonyms: http://www.chemicalbook.com/ChemicalProductProperty_EN_CB9729858.htm



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