Product :
MINERAL MODIFIED GLUTAMATE AGAR BASE

Also known as
MMGA

Specification
Solid medium for resuscitation and recovery of *E. coli* cells damaged by heat, freezing or chemical processes according to FIL-IDF and ISO standards.

Formula * in g/L

Lactose	10,000
Sodium formate	0,250
L-Cysteine HCl	0,020
L-Aspartic acid	0,024
L-Arginine	0,020
Thiamine	0,001
Nicotinic acid	0,001
Pantothenic acid	0,001
Magnesium sulfate	0,100
Ammonium-iron citrate	0,010
Calcium chloride	0,010
Dipotassium phosphate	0,900
Agar	15,000

Final pH 6,7 ±0,2 at 25 ºC

The sodium glutamate (6,35 g/L) and ammonium chloride (2,5 g/L) are not included in the formulation of the dehydrated powder to improve its stability. Moreover a longer shelf-life and a better performance of the medium is obtained.

* Adjusted and /or supplemented as required to meet performance criteria

Directions
Suspend 26,33 g of the powder in 1 L of distilled water in which 2,5 g of ammonium chloride (Art. No. AM0273) is dissolved and add 6,35 g of sodium glutamate (Art. No. SO0400). Bring the mixture to the boil to dissolve.
Distribute it into suitable containers and sterilize in the autoclave at 115ºC for 10 minutes.
Note: The pH value is critical for performance of the medium. The heating process can affect the pH and care must be taken to adjust the medium to give a final pH of 6,7.

Description
This medium is produced according to the formulation established by standards ISO 16649-1 and FIL-IDF 170A:1999 for the enumeration of presumptive testing of *Escherichia coli* in milk and other foods.Also recommended for the resuscitation step in the colony-count technique at 44ºC using membrane filtration. This method is preferred by FIL-IDF for the examination of milk samples and milk products in which comparatively large numbers of *Escherichia coli* are suspected (more than 100 per g or 10 per mL).

Technique
Using sterile forceps place a cellulose acetate membrane in the dried surface of each of two plates of Glutamate Agar aseptically. Take care to avoid trapping air bubbles beneath the membranes and gently flatten the membranes with a sterile spreader (Drigalsky loop).
Put 1 mL of the test sample to the centre of each membrane. Spread the inoculum evenly over the whole membrane surface, using the sterile spreader avoiding any spillage from the membrane.
Leave the inoculated plates in a horizontal position for 15 minutes until the inoculum has soaked into the agar. Incubate the plates for 4 ± 0,25 h at 37ºC±1 with the membrane/agar surface uppermost. After this time, the membranes are transferred with inoculated side uppermost, to TBX Agar plates.
Refer to suitable FIL-IDF/ISO standards for sample preparation, dilution process and interpretation of results.

Quality control

Incubation temperature: 37±1ºC(4h) / 44ºC±1 **Incubation time:** 20-24 h

Inoculum: 50-100 CFU (Productivity) // 1.000-10.000 CFU (Selectivity). Membrane Filter Method in MMGA (4h) /after TBX A

Microorganism	Growth	Remarks
Enterococcus faecalis ATCC® 29212	Inhibited	Recovery in TBX A.
Escherichia coli ATCC® 25922	Productivity > 0.50	Recovery in TBX A. Blue colonies.
Escherichia coli ATCC® 8739	Productivity > 0.50	Recovery in TBX A. Blue colonies.
E. coli NCTC® 13216	Productivity > 0.50	Recovery in TBX A. Blue colonies.
C.freundii ATCC® 43864	Specificity (Loop spreading)	Recovery in TBX A. Colorless colonies.

References

· IDF-FIL Int. Standard 170A (1999) Milk and milk products - Enumeration of presumptive Escherichia coli. Part 3: Colony-count technique at 44ºC using Membranes.

· ISO Standard 11866-2:2005. Milk and milk products - Enumeration of presumptive Escherichia coli. Part 2: Colony count technique at 44ºC using membranes.

· ISO Standard 16649-1:2018. Microbiology of foods chain- Horizontal method for the enumeration of ß-glucuronidase-positive *Escherichia coli* - Part 1: Colony count technique at 44ºC using membranes and 5-bromo-4-chloro-3-indolyl ß-D-glucoride.

· MANAFI, M. (2003) Media for the detection and enumeration of "total" Enterobacteriaceae, coliforms and Escherichia coli from water and foods. In Handbook of culture media for food microbiology. J. E. L. Corry et al. (eds). Elsevier Science B. V. Amsterdam.

· MURANO E.A. & J.A. HUDNALL (2001) Media, Reagents and stains. In Downes, F.P. & K. Ito (Eds.) Compendium of methods for the microbiological examination of foods. 4th ed. APHA. Washington.

Storage

For laboratory use only. Keep tightly closed, away from bright light, in a cool dry place (+4 ºC to 30 ºC).