MUG Lauryl Sulphate Broth, Modified

M1046I

MUG Lauryl Sulphate Broth, Modified is used as a selective enrichment medium for enumeration of presumptive *Escherichia coli* and other coliforms from milk and milk products.

Composition**

Ingredients	Gms / Litre
Casein enzymic hydrolysate	20.000
Lactose	5.000
Dipotassium hydrogen phosphate	2.750
Monopotassium phosphate	2.750
Sodium chloride	5.000
4-Methylumbelliferyl ß-D-glucuronide (MUG)	0.100
Sodium lauryl sulphate	0.100
Tryptophan	1.000
Final pH (at 25°C)	6.8±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 36.7 grams in 1000 ml distilled water. Heat if necessary to dissolve the medium completely. Dispense into tubes with inverted Durham's tubes as required, taking into account the volume of the sample to be tested. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes.

Principle And Interpretation

The coliform group consists of several genera of bacteria belonging to the family *Enterobacteriaceae* . Lauryl Sulphate Broth formulated by Mallmann and Darby (1) is recommended by APHA for the detection and enumeration of coliform organisms in foods, water and waste water (2, 3). MUG is added in Lauryl Sulphate Broth as the fluorogenic compound which permits the rapid detection of *Escherichia coli* when observed under UV light where further confirmation is not required (2,4). MUG Lauryl Sulphate Broth, Modified is recommended by the ISO Committee (6) for enumeration of presumptive *E.coli* and other coliforms from milk and milk products.

E.coli possesses the enzyme beta-glucuronidase and is capable of cleaving the fluorogenic substrate 4-Methylumbelliferyl beta-D-glucuronide (MUG) with the corresponding release of the fluorogen.

MUG detects anaerogenic strains, which may not be detected in the conventional procedure. Feng and Hartman (5) used MUG-containing medium for studying beta-glucuronidase activity and found that *E.coli* has 96-100% activity, while *Salmonella* species has 17% and *Shigella* species 40% activity and other genera were negative. For weakly positive strains, incubation should be carried out overnight. Robison (4) achieved no false negative results and about 5% false positive results.

Casein enzymic hydrolysate provides nutrients while lactose acts as energy source. Sodium lauryl sulphate inhibits many organisms other than coliforms. 4-methylumbelliferyl- beta -D-glucuronide is hydrolyzed by the enzyme beta-glucuronidase to yield 4-methylumbelliferone, a fluorescent end product.

Inoculate 10 ml of the test specimen into three tubes each of single strength and double strength . Incubate the tubes at 35°C for 24 hours. Observe for opacity and gas formation. For confirmation of presumptive *E.coli* , observe for fluorescence and perform indole reaction using Kovacs Reagent (R008) (6).

Quality Control

Appearance

Cream to yellow homogeneous free flowing powder

Colour and Clarity of prepared medium

Light amber coloured clear solution without any precipitate

Reaction
Reaction of 3.67% w/v aqueous solution at 25°C. pH : 6.8±0.2

pH
6.60-7.00

Cultural Response
M1046I: Cultural characteristics observed after an incubation at 30°C for 24 hours

Organism	Inoculum (CFU)	Growth	Fluorescence under uv	Indole production
Enterobacter aerogenes ATCC 13048	50-100	luxuriant	negative	negative reaction
Escherichia coli ATCC 25922	50-100	luxuriant	positive	positive reaction,red ring at the interface of the medium

Storage and Shelf Life
Store below 30°C in tightly closed container and the prepared medium at 2 8°C. Use before expiry date on the label.

Reference
1.Mallmann W. L. and Darby C. W., 1941, Am. J. Public Health, 31:127.
2.Downes F. P and Ito K., (Eds.), 2001, Compendium of Methods for the Microbiological Examination of Foods, 4th Ed., APHA, Washington, D.C.
3.Greenberg A. E., Trussell R. R. and Clesceri L. S., (Eds.), 1985, Standard Methods for the Examination of Water and Wastewater, 16th Ed., APHA, Washington, D.C.
4.Robison, 1984, Appl. Environ. Microbiol., 48:285.
5.Feng P. C. S. and Hartman P. A., 1982, Appl. Environ. Microbiol., 43 : 1320.6. International Organization for Standardization (ISO), ISO 11866-2:1997 (E)

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