HealthLink
800-638-2625

Product No. 1802
Revision No. New

PRODUCT INFORMATION AND QUALITY CONTROL SHEET
EC MEDIUM w/MUG

I. INTENDED USE

EC Medium with MUG is used for the fluorogenic detection of *Escherichia coli*.

II. SUMMARY AND EXPLANATION

EC Medium was developed by Hajna and Perry[1] in an effort to improve the methods for the detection of the coliform group and *E. coli*. This medium consists of a buffered lactose broth with the addition of 0.15% Bile Salts Mixture. Growth of spore-forming bacteria and fecal streptococci is inhibited by the bile salts, while growth of *E. coli* is enriched by its presence. EC Medium with MUG is the same formula as EC Medium, with the addition of 4-methylumbelliferyl-β-D-glucornide. Feng and Hartman[2] developed a rapid assay for *E. coli* by incorporating 4-methylumbelliferyl-β-D-glucornide (MUG) into Lauryl Tryptose Broth at a final concentration of 100 µg/ml. Moburg[3] determined the amount of MUG could be reduced to a final concentration of 50 µg/ml without adversely affecting results.

EC Medium w/MUG is prepared according to the formula specified by US EPA[4] and methods for water and food testing.[5,6]

III. PRINCIPLES OF THE PROCEDURE

Enzymatic Digest of Casein provides nitrogen, vitamins, and amino acids in EC Medium w/ MUG. Lactose is the carbon source. Bile Salts Mixture is the selective agent against non-fecal gram-positive bacteria. Dipotassium Phosphate and Monopotassium Phosphate are the buffering agents. Sodium Chloride is used to maintain the osmotic balance of the medium. Incubation at 44.5^{0}C provides additional selectivity.

E. coli produces the enzyme glucuronidase that hydrolyzes MUG to yield a fluorogenic product that is detectable under long-wave (366 nm) UV light. The addition of MUG to EC Medium provides another criterion, along with growth response and gas production, to determine the presence of *E. coli* in food and environmental samples.

IV. TYPICAL FORMULA AND APPEARANCE

Appearance = Light amber, clear to very slightly opalescent.

(Approximate formula* per liter of processed water)

Enzymatic Digest of Casein	20 g
Lactose	5 g
Bile Salts Mixture	1.5g
Sodium Chloride	5 g
Monopotassium Phosphate	1.5 g
Dipotassium Phosphate	4 g
4-Methylumbelliferyl-β-D-Glucornide	0.05g

Final pH 6.9 ± 0.2 @ 25^{0}C

*adjusted and/or supplemented to meet performance criteria.

V. PRECAUTIONS

This product is for *IN VITRO* diagnostic use only. Culture specimens may contain microorganisms which can be potentially infectious to the user. Strict adherence to aseptic techniques and established precautions against microbiological hazards should be followed throughout the procedure. Carefully dispose of all items which contact patient specimens or isolated bacteria.

VI. STORAGE/SHELF LIFE

Media should be stored at 2-8^{0}C (36-46^{0}F). DO NOT FREEZE OR EXPOSE TO HIGH TEMPERATURES. Allow unopened tubes to warm to room temperature prior to inoculation. Prior to and during inoculation procedures, tubes should be handled in a manner that minimizes product exposure to the environment. Product that has exceeded the assigned expiration date noted on the label should not be used.

VII. SPECIMEN COLLECTION

The quality of culture results depends primarily on the adequacy and condition of the specimen submitted for examination.

VIII. MATERIALS PROVIDED

EC Medium w/ MUG Tubes – 10/box

IX. MATERIALS REQUIRED BUT NOT PROVIDED

Incubator maintaining 44.5^{0}C.

Ancillary culture media

X. PROCEDURE

Refer to appropriate references for specific procedures using EC Medium w/ MUG.[4-6]

XI. EXPECTED RESULTS

NCCLS CONTROL ORGANISMS (ATCC STRAINS)

Microorganism	Response	Reaction (Gas)	Fluorescence
Enterococcus faecalis (ATCC 29212)	inhibited	negative	negative
Escherichia coli (ATCC 25922)	good growth	positive	positive
Klebsiella pneumoniae (ATCC 33495)	marked to complete inhibition	variable	negative

XII. LIMITATIONS

The ability to detect microorganisms by culture techniques can be affected by the following factors: improper specimen collection, storage and inoculation, improper culture incubation temperatures and atmospheres, improper length of culture incubation, and improper storage and handling of culture media.

XIII. REFERENCES

1. Hajna and Perry. 1943. Am J. Public Health. 33:550.
2. Feng, P.C.S., and P.A. Hartman. 1982. Fluorogenic assays for immediate confirmation of *Escherichia coli*. Appl. Environ. Microbiol. 43:1320-1329.
3. Moberg,L.J.1985. Fluorogenic assay for rapid detection of *Escherichia coli* in food. Appl. Environ. Microbiol. 50:1383-1387.
4. Federal Register. 1991. National primary drinking water regulation; analytical techniques; coliform bacteria. Fed.Regist. 56:636-643.
5. Eaton, A.D., L.S. Clescari, and A.E. Greenberg (eds.). 1995. Standard methods for the examination of water and wastewater. 19th ed. American Public Health Association, Washington, D.C.
6. Vanderzant,C., and D.F. Splittstoesser (eds.). 1992. Compendium of methods for the microbiological examination of foods, 3rd ed. American Public Health Association, Washington, D.C.

USER QUALITY ASSURANCE/ QUALITY CONTROL PROCEDURES AND INFORMATION

HealthLink recommends that the following quality assurance and quality control procedures be performed on each batch of product.

I. QUALITY ASSURANCE

The following quality assurance procedures must be performed to assure the product will perform according to its intended use within the assigned expiry date:

1. Daily, document that product storage refrigerator maintains temperature within the recommended range: 2-8^{0}C.
2. Daily, document that laboratory incubator maintains temperature within the recommended range: 44-45^{0}C.

II. QUALITY CONTROL

The following incoming inspection procedures must be performed for each batch (batch = same lot, same shipment) of culture media received in the laboratory:

Inspect tubes according to instructions contained in Section VI: STORAGE/SHELF LIFE.

Note: Notify Technical Service immediately if media does not meet the inspection criteria.

TECHNICAL SERVICE

HealthLink provides a toll free technical service line (1-800-638-2625) to assist with product usage. To have technical questions answered, please call between the hours of 9:00 am to 5:00 pm EST.

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