Enteric Fermentation Base

M1662

Enteric Fermentation Base is used with added carbohydrate and indicator for differentiating microorganisms based on fermentation reactions.

Composition**

Ingredients	Gms / Litre
Beef extract	3.000
Peptic digest of animal tissue	10.000
Sodium chloride	5.000
Final pH (at 25°C)	7.2±0.1

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 18 grams in 1000 ml distilled water. Add 10 ml of Andrade's indicator. Heat if necessary to dissolve the medium completely. Add the test carbohydrate in desired quantity (0.5% or 1%). Mix well and dispense into tubes containing inverted Durhams tube. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes.

Principle And Interpretation

Bacteria are differentiated by the carbohydrates they utilize and the types and quantities of acid produced. These differences in enzymatic activity serve as one of the important characteristic by which different species are recognized. This serves as an important criterion in their identification (1- 4). A variety of different liquid or agar media can be used to measure the ability of test organism to fermentatively utilize carbohydrates. The principle of carbohydrate fermentation is based on Pasteurs studies of bacteria and yeasts, which state that the action of many species of microorganisms on a carbohydrate substrate results in acidification of the medium. The term fermentation is also used in reference to the utilization of carbohydrates by bacteria. Fermentation is an oxidation- reduction metabolic process that takes place in an anaerobic environment, and an organic substrate serves as the final hydrogen (electron) acceptor. This process is detected by observing colour changes in the pH indicator, as acid products are formed.

A basal medium for determining the fermentation reactions of microorganisms must be capable of supporting growth of test organisms and be free from fermentable carbohydrates. Enteric Fermentation Base is prepared according to the formula described by Edwards and Ewing (5).

Beef extract and peptic digest of animal tissue provide the carbon and nitrogen sources required for good growth of a wide variety of organisms. Sodium chloride maintains the osmotic balance of the medium. The microorganisms tested are differentiated by their ability to ferment a particular carbohydrate that has been added to the Enteric Fermentation Base. The desired carbohydrate is added to the medium either before or after sterilization. The fermentation and resultant acid production are indicated by a change in color of the pH indicator (Andrades indicator) present in the medium from light amber to dark pink to red. Gas produced during fermentation by fermenting bacteria is indicated by gas bubbles collected in inverted Durhams tubes. Negative tubes remain colourless and should be observed regularly for a total of 30 days.

Quality Control

Appearance
Cream to light tan homogeneous free flowing powder

Colour and Clarity of prepared medium
Light pink coloured, clear solution in tubes

Reaction
Reaction of 1.8% w/v aqueous solution at 25°C. pH : 7.2±0.1

pH
7.10-7.30

Cultural Response

M1662: Cultural characteristics observed after an incubation at 35-37°C for 18- 24 hours.

Organism	Inoculum (CFU)	Growth	Acid without dextrose	Gas without dextrose	Acid with dextrose	Gas with dextrose
Escherichia coli ATCC 25922	50-100	good	negative reaction, no colour change or pinkish amber	negative reaction	positive reaction, red colour	positive reaction
Salmonella Typhimurium ATCC 14028	50-100	good	negative reaction, no colour change or pinkish amber	negative reaction	positive reaction, red colour	positive reaction
Shigella flexneri ATCC 12022	50-100	good	negative reaction, no colour change or pinkish amber	negative reaction	positive reaction, red colour	negative reaction

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. Ewing, 1986, Edwards and Ewings Identification of Enterobacteriaceae, 4th Edition, Elsevier Science Publishing Co., Inc., New York, N.Y.
2. Forbes B. A., Sahm A. S., and Weissfeld D. F., Bailey & Scotts Diagnostic Microbiology, 10th Ed., 1998, Mosby, Inc., St. Louis, Mo.
3. Holt, Krieg, Sneath, Staley and Williams (Ed.), 1994, Bergeys Manual of Determinative Bacteriology, 9th Ed., Williams & Wilkins, Baltimore, Md.
4. Murray P. R., Baron J. H., Pfaller M. A., Jorgensen J. H. and Yolken R. H., (Eds.), 2003, Manual of Clinical Microbiology, 8th Ed., American Society for Microbiology, Washington, D.C.
5. Edwards and Ewing, 1972, Identification of Enterobacteriaceae, 3rd Ed., Burgess Publishing Co., Minneapolis, Minn.

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