

Technical Information

Endo Agar Base

Product Code: DM 2077

Application: - Endo Agar Base is recommended for preparing Endo Agar to confirm presumptive test for lactose fermenting coliforms.

Composition**

Ingredients	Gms / Litre
Peptic digest of animal tissue	10.000
Lactose	10.000
Dipotassium phosphate	3.500
Sodium sulphite	2.500
Agar	12.000
Final pH (at 25°C)	7.5±0.2

**Formula adjusted, standardized to suit performance parameters

Principle & Interpretation

Endo had first developed a culture medium for differentiation of lactose fermenters and lactose non-fermenters while inhibiting gram-positive bacteria ⁽¹⁾ without the traditionally use of bile salts. Endo was successful in inhibiting gram-positive bacteria on his medium by the addition of sodium sulphite and basic fuchsin. The resulting Endo Agar, also known as Fuchsin Sulphite and Infusion Agar, was used to isolate the typhoid bacilli. Many modifications of this media have been done over the years. Endo Agar is recommended by APHA as an important medium in the microbiological examination of water and wastewater, dairy products and foods ⁽²⁻⁴⁾ It is also used for the detection and isolation of coliforms and fecal coliforms from milk, dairy products food and to confirm coliform bacteria following presumptive test of drinking water.

The medium contains peptic digest of animal tissue which provide nitrogen, carbon, vitamins and minerals required for bacterial growth. Sodium sulphite and basic fuchsin (FD) has inhibitory effect on gram-positive microorganisms. Lactose fermenting coliforms produce aldehyde and acid. The aldehyde in turn liberates fuchsin from the fuchsin-sulphite complex, giving rise to a red colouration of colonies. With *Escherichia coli*, this reaction is very pronounced as the fuchsin crystallizes, exhibiting a permanent greenish metallic lustre (fuchsin lustre) to the colonies.

Methodology

Suspend 38 grams of powder media in 1000 ml distilled water. Add 4 ml of 10% Basic Fuchsin (MS2059). Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Mix well before pouring into sterile Petri plates.

If the solidified culture medium is somewhat too red, then to remove the colour, add a few drops (max. 1 ml/litre) of a freshly prepared 10% Sodium sulphite solution and boil.

Caution: Basic fuchsin is a potential carcinogen and care should be taken to avoid inhalation of the powdered dye and contamination of the skin.

Quality Control

Physical Apperance

Cream to yellow homogeneous free flowing powder

Gelling

Firm, comparable with 1.2% Agar gel

Colour and Clarity of prepared medium

After addition of MS2059: Orangish pink coloured, clear to slightly opalescent gel with fine precipitate forms in Petri plates.

Reaction

Reaction of 3.8% w/v aqueous solution at 25°C. pH : 7.5±0.2

pH range 7.30-7.70

Cultural Response/ characteristics

Dm 2077: Cultural characteristics observed with added Basic fuchsin (MS2059) after an incubation at 35-37°C for 18-24 hours.

Organism	Inoculum (CFU)	Growth	Recovery	Colour of colony
<i>Bacillus subtilis</i> ATCC 6633	>=10 ³	inhibited	0%	
<i>Enterobacter aerogenes</i> ATCC 13048	50-100	good-luxuriant	>=50%	pink
<i>Enterococcus faecalis</i> ATCC 29212	50-100	none-poor	<=10%	pink, small
<i>Escherichia coli</i> ATCC 25922	50-100	good-luxuriant	>=50%	pink to rose red with metallic sheen
<i>Klebsiella pneumoniae</i> ATCC 13883	50-100	good-luxuriant	>=50%	pink, mucoid
<i>Proteus vulgaris</i> ATCC 13315	50-100	good-luxuriant	>=50%	colourless to pale pink
<i>Pseudomonas aeruginosa</i> ATCC 27853	50-100	good-luxuriant	>=50%	colourless, irregular
<i>Salmonella Typhi</i> ATCC 6539	50-100	good-luxuriant	>=50%	colourless to pale pink
<i>Shigella sonnei</i> ATCC 25931	50-100	good-luxuriant	>=50%	irregular colourless to pale pink
<i>Staphylococcus aureus</i> ATCC 25923	>=10 ³	inhibited	0%	pale pink
<i>Enterobacter cloacae</i> ATCC 13047	50-100	good	40-50%	pink
<i>Salmonella Typhimurium</i> ATCC 14028	50-100	good-luxuriant	>=50%	colourless
<i>Salmonella Enteritidis</i> ATCC 13076	50-100	good-luxuriant	>=50%	colourless
<i>Shigella flexneri</i> ATCC 12022	50-100	good-luxuriant	>=50%	colourless

Storage and Shelf Life

Dried Media: Store below 30°C in tightly closed container and use before expiry date as mentioned on the label.

Prepared Media: 2-8° in sealable plastic bags for 2-5 days.

Further Reading

1. Endo S., 1904, Zentralbl. Bakteriologie, Abt. 1, Orig.35:109-110.
2. Eaton A. D., Clesceri L. S., Rice E. W. and Greenberg A. W., (Eds.), 2005, Standard Methods for the Examination of Water and Wastewater, 21st Ed., APHA, Washington, D.C.
3. Downes F. P. and Ito K.,(Eds.), 2001, Compendium of Methods for the Microbiological Examination of foods, 4th Ed., American Public Health Association, Washington, D.C.
4. Wehr H. M. and Frank J. H., 2004, Standard Methods for the Microbiological Examination of Dairy Products, 17th Ed., APHA Inc., Washington, D.C.

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