



Antibiotic Assay Medium No.1 (Seed Agar)

M003

Intended use

Antibiotic Assay Medium No.1 (Seed Agar) is used in the microbiological assay of beta-lactam and other antibiotics.

Composition**

Ingredients	Gms / Litre
Peptone	6.000
Tryptone	4.000
Yeast extract	3.000
HM peptone B #	1.500
Dextrose (Glucose)	1.000
Agar	15.000
Final pH (at 25°C)	6.6±0.2

**Formula adjusted, standardized to suit performance parameters

Equivalent to Beef extract

Directions

Suspend 30.5 grams in 1000 ml purified/distilled water. Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 45-50°C. Mix well and pour into sterile Petri plates.

Advice: Recommended as a inoculum medium for Amikacin, Bacitracin, Capreomycin, Cephalothin, Cephaperin, Chloramphenicol, Chlortetracycline, Cloxacillin Cycloserine, Colistimethate sodium, Colistin, Demeclocycline, Dihydrostreptomycin, Erythromycin, Framycetin, Gentamicin, Kanamycin, Kanamycin B, Kanamycin sulphate, Lymecycline, Methacycline, Nafcillin, Neomycin, Netilmicin, Novobiocin, Oxytetracycline, Paromomycin, Penicillin-G, Rifamycin sodium Rolitetracycline, Sisomycin Spiramycin, Streptomycin Tetracycline, Tobramycin, Troleandomycin, Tylosin

Principle And Interpretation

The potency of an antibiotic can be determined by chemical, physical and biological means. An assay is made to determine the ability of an antibiotic to kill or inhibit the growth of living microorganisms. Biological tests offer the most convenient means of performing an assay (1), since a reduction in the antimicrobial activity of a specific antibiotic reveals changes not usually displayed by chemical methods (2). Antibacterial susceptibility testing may be performed by either dilution (turbidimetric) or diffusion methods. The choice of methodology is often based on many factors, including relative ease of performance, flexibility and use of automated or semi-automated devices for both identification and susceptibility testing (3). Grove and Randall have elucidated those antibiotic assays and media in their comprehensive treatise on antibiotic assays (4). Antibiotic Assay Medium No.1 is used in the microbiological assay of β -lactam and other antibiotics. These media are prepared according to the specifications detailed in various pharmacopoeias (2,5,6) and by the FDA (7).

Freshly prepared plates should be used for antibiotic assays. Test organisms are inoculated in sterile seed agar cooled to 40-45°C and spread evenly over the surface of solidified base agar. After incubation the concentration of the antibiotic being assayed is determined by measuring the zone of inhibition obtained, with that of reference standard antibiotic. All conditions in the microbiological assay must be carefully controlled. The use of standard culture media in the test is one of the important steps for good results.

Nutrients and growth factors are supplied by the ingredients like peptone, Tryptone, yeast extract and HM Peptone B.

Dextrose is supplemented as a carbon and energy source.

Type of specimen

Pharmaceutical preparations

Specimen Collection and Handling

For pharmaceutical samples follow appropriate techniques for handling specimens as per established guidelines (2,5,6). After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning and Precautions :

Read the label before opening the container. Wear protective gloves/protective clothing/eye protection/ face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling specimens. Safety guidelines may be referred in individual safety data sheets

Limitations :

1. Freshly prepared plates must be used or it may result in erroneous results.

Performance and Evaluation

Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature.

Quality Control

Appearance

Cream to yellow homogeneous free flowing powder

Gelling

Firm,comparable with 1.5% Agar gel

Colour and Clarity of prepared medium

Yellow coloured, clear to slightly opalescent gel forms in Petri plates.

Reaction

Reaction of 3.05% w/v aqueous solution at 25°C. pH : 6.6±0.2

pH

6.40-6.80

Cultural Response

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

Cultural Response

Organism	Inoculum (CFU)	Growth	Recovery	Inoculum medium	Assay medium	Inoculum & Assay medium
<i>Bacillus subtilis subsp. spizizenii</i> ATCC 6633 (00003*)	50-100	luxuriant	≥70%	Framycetin, Josamycin, Josamycin propionate, Kanamycin B, Spiramycin, Streptomycin, Vancomycin	Streptomycin, Vancomycin	
<i>Bordetella bronchiseptica</i> ATCC 4617	50-100	luxuriant	≥50%	Colistimethate sodium, Colistin, Polymyxin B		
<i>Escherichia coli</i> ATCC 10536	50-100	luxuriant	≥70%	Chloramphenicol		
<i>Bacillus cereus var mycoides</i> ATCC 11778 (00001*)	50-100	luxuriant	≥70%	Oxytetracycline, Tetracycline		
<i>Bacillus pumilis</i> ATCC 14884	50-100	luxuriant	≥70%	Chlortetracycline, Framycetin, Kanamycin sulphate		
<i>Klebsiella pneumoniae</i> ATCC 10031	50-100	luxuriant	≥70%	Capreomycin, Dihydrostreptomycin, Neomycin, Streptomycin, Troleandomycin		

<i>Micrococcus luteus</i> ATCC 9341	50-100	luxuriant	>=70%	Erythromycin, Rifamycin sodium	Bacitracin
<i>Micrococcus luteus</i> ATCC 10240	50-100	luxuriant	>=70%		
<i>Pseudomonas aeruginosa</i> ATCC 25619	50-100	luxuriant	>=70%	Carbenicillin	
<i>Staphylococcus aureus</i> ATCC 29737	50-100	luxuriant	>=70%	Amikacin, Cephothin, Cephapirin, Chlotetracycline, Cloxacillin, Cycloserine, Demeclocycline, Doxycycline, Kanamycin, Methacycline, Nafcillin, Oxytetracycline, Penicillin-G, Rolitetracycline, Tetracycline, Tobramycin, Tylosin	Cephalothin, Cephapirin, Cloxacillin, Nafcillin, Penicillin-G
<i>Staphylococcus epidermidis</i> ATCC 12228 (00036*)	50-100	luxuriant	>=70%	Gentamicin, Neomycin, Netilmicin, Novobiocin, Sisomycin, Paromomycin	

*- Corresponding WDCM numbers

Storage and Shelf Life

Store between 10-30°C in a tightly closed container and use freshly prepared medium. Use before expiry date on the label. On opening, product should be properly stored dry, after tightly capping the bottle in order to prevent lump formation due to the hygroscopic nature of the product. Improper storage of the product may lead to lump formation. Store in dry ventilated area protected from extremes of temperature and sources of ignition. Seal the container tightly after use. Use before expiry date on the label.

Product performance is best if used within stated expiry period.

Disposal

User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with clinical sample must be decontaminated and disposed of in accordance with current laboratory techniques (8,9).

Reference

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4. Grove and Randall, 1955, Assay Methods of Antibiotics Medical Encyclopedia, Inc. New York.
5. European Pharmacopoeia, 2017, European Department, for the Quality of Medicines
6. British Pharmacopoeia, 2016, The Stationery office British Pharmacopoeia
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